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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/904,963	12/22/2015	9218574	3128.2.5	6149

36491 7590 12/02/2015

Kunzler Law Group
50 W. Broadway
10th Floor
SALT LAKE CITY, UT 84101

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 237 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

PurePredictive, Inc., Sandy, UT
Kelly D. Phillipps, Salt Lake City, UT;
Richard W. Wellman, Park City, UT;

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IR103 (Rev. 10/09)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
Change(s) applied to document, /R.K.C./ 11/3/2015	1	20100131314		2010-05-27	Lo Yuk Ting et al. ~~Ting, et al.~~	
	2	20110111384		2011-05-12	Dietrich, et al.	
	3	20130004930		2013-01-03	Sorenson, et al.	

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

EFS Web 2.1.17 ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.M./

Receipt date: 04/03/2015	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
(Not for submission under 37 CFR 1.99)	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

Change(s) applied to document, /R.K.C./ 11/3/2015	17	20100023798 ~~20090023798~~		2010-01-28	Meijer, et al.	
	18	20100138026		2010-06-03	Kaushal, et al.	
	19	20110302153		2011-12-08	Meretakis, et al.	
	20	20130218042		2013-08-22	Mardirossian	
	21	20140136452		2014-05-15	Wellman, et al.	
	22	20140180738		2014-06-26	Phillipps, et al.	
	23	20140205990		2014-07-24	Wellman, et al.	
	24	20140195466		2014-07-10	Phillipps, et al.	
	25	20140236875		2014-08-21	Phillipps, et al.	
	26	20140358828		2014-12-04	Phillipps, et al.	
	27	20140358825		2014-12-04	Phillipps, et al.	

EFS Web 2.1.17 ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.M./

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

36491 7590 10/20/2015
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SALT LAKE CITY, UT 84101

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Scott C. Hilton	(Depositor's name)
/Scott C. Hilton/	(Signature)
November 11, 2015	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/904,963	05/29/2013	Kelly D. Phillipps	3128.2.5	6149

TITLE OF INVENTION: USER INTERFACE FOR MACHINE LEARNING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	01/20/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
MISIR, DAYWAYSHWAR D	2129	706-011000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Kunzler Law Group, PC
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: PurePredictive, Inc.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Sandy, UT

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☒ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Scott C. Hilton/ Date November 11, 2015
Typed or printed name Scott C. Hilton Registration No. 66011

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	13904963
Filing Date:	29-May-2013
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Filer:	Scott C. Hilton/Vicki Crist
Attorney Docket Number:	3128.2.5

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**480**

Electronic Acknowledgement Receipt	
EFS ID:	24048030
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	13-NOV-2015
Filing Date:	29-MAY-2013
Time Stamp:	01:31:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$480
RAM confirmation Number	10176
Deposit Account	506258
Authorized User	HILTON, SCOTT
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_TransmittalofIssueFee.pdf	41885 108a748b37bea9bb3a03f16ce2ccf5ad15263eaf	no	2
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	3128_2_5_IssueFee.pdf	167980 a55c90f7c83b8404b26050e563dcfdb8e6faa5d3	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30497 da1f1353f169ed5047c78514d9bd8f7b5d51e46e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	240362		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT
Docket No. 3128.2.5

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

APPLICANT(S):	KELLY D. PHILLIPPS, ET AL.
SERIAL NO.:	13/904,963
FILING DATE:	MAY 29, 2013
TITLE:	USER INTERFACE FOR MACHINE LEARNING
EXAMINER:	DAYWAYSHWAR D. MISIR
GROUP ART UNIT:	2129
ATTY. DKT. NO.:	3128.2.5

MAIL STOP ISSUE FEE
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ALEXANDRIA, VA 22313-1450

TRANSMITTAL OF THE
PAYMENT OF ISSUE FEE

Sir:

The enclosed Payment of the Issue Fee Due is submitted herewith pursuant to 37 C.F.R. ' 1.67 and M.P.E.P. ' 603.01 for filing in the matter of the United States patent application as hereinabove identified.

Please address all future correspondence in connection with the above-identified patent application to the attention of the undersigned.

Respectfully Submitted,
Scott C. Hilton

/Scott C. Hilton/

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicant

Date: November 11, 2015

Scott C. Hilton
50 West Broadway, 10th Floor
Salt Lake City, Utah 84101
Telephone: 801/994-4646

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/904,963	05/29/2013	2129	970	3128.2.5	26	3

CONFIRMATION NO. 6149

CORRECTED FILING RECEIPT

36491
Kunzler Law Group
50 W. Broadway
10th Floor
SALT LAKE CITY, UT 84101

OC000000078349488

Date Mailed: 10/29/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Kelly D. Phillipps, Salt Lake City, UT;
Richard W. Wellman, Park City, UT;

Applicant(s)

PurePredictive, Inc., Sandy, UT

Power of Attorney: The patent practitioners associated with Customer Number 36491

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 06/17/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/904,963**
Projected Publication Date: Not Applicable
Non-Publication Request: No
Early Publication Request: No

** **SMALL ENTITY** **

Title

USER INTERFACE FOR MACHINE LEARNING

Preliminary Class

706

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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NOTICE OF ALLOWANCE AND FEE(S) DUE

36491 7590 10/20/2015

Kunzler Law Group
50 W. Broadway
10th Floor
SALT LAKE CITY, UT 84101

EXAMINER	
MISIR, DAYWAYSHWAR D	
ART UNIT	PAPER NUMBER
2129	

DATE MAILED: 10/20/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/904,963	05/29/2013	Kelly D. Phillipps	3128.2.5	6149

TITLE OF INVENTION: USER INTERFACE FOR MACHINE LEARNING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	01/20/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

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Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

36491 7590 10/20/2015
Kunzler Law Group
50 W. Broadway
10th Floor
SALT LAKE CITY, UT 84101

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/904,963	05/29/2013	Kelly D. Phillipps	3128.2.5	6149

TITLE OF INVENTION: USER INTERFACE FOR MACHINE LEARNING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0	$0	$480	01/20/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
MISIR, DAYWAYSHWAR D	2129	706-011000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
❑ Applicant certifying micro entity status. See 37 CFR 1.29
NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/904,963	05/29/2013	Kelly D. Phillipps	3128.2.5	6149

36491 7590 10/20/2015

Kunzler Law Group
50 W. Broadway
10th Floor
SALT LAKE CITY, UT 84101

EXAMINER	
MISIR, DAYWAYSHWAR D	

ART UNIT	PAPER NUMBER
2129	

DATE MAILED: 10/20/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/904,963	Applicant(s) PHILLIPPS ET AL.	
	Examiner DAVE MISIR	Art Unit 2129	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *amendments and remarks received on 09/15/2015*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1 and 3-26*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date See Continuation Sheet
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/DAVE MISIR/ Examiner, Art Unit 2129	/JEFFREY A GAFFIN/ Supervisory Patent Examiner, Art Unit 2129

Continuation of Attachment(s) 2. Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date: 07/01/2015,08/17/2015.

DETAILED ACTION

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

The 35 USC 112 rejection on the relevant claim is withdrawn based on the amendment submitted.

The 35 USC 103 rejections on the claims are withdrawn based on the amendments submitted and in particular on the independent claims.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

See applicants' arguments filed in the Remarks on pages 13-16.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVE MISIR whose telephone number is (571)272-5243. The examiner can normally be reached on M-Th 7:30 - 5 PM, F 7:30 - 4 PM (Off Alternate Fridays).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DAVE MISIR/
Examiner, Art Unit 2129

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13904963	PHILLIPPS ET AL.
	Examiner	Art Unit
	DAVE MISIR	2129

CPC- SEARCHED		
Symbol	Date	Examiner
G06N 99/005, 99/00, 5/04, 5/02, 5/025; G06Q 30/0241; G06F 3/048	4/7/2015	DM
G06N 99/005, 99/00, 5/04, 5/02, 5/025; G06Q 30/0241; G06F 3/048	9/21/2015	DM

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
706	11-12. With Keywords: predictive analytics/modeling, machine learning, dynamic/predictive user interface, large data set/big data, permutation/combination/variation machine learning results/parameters, update/adjust machine learning parameters/result.	4/7/2015	DM
706	11-12	9/21/2015	DM

SEARCH NOTES		
Search Notes	Date	Examiner
See EAST search history attached	4/7/2015	DM
Inventor name search in PALM	4/7/2015	DM
NPL search - Google Scholar.	4/7/2015	DM
InnovationQ - IP.com	4/7/2015	DM
Updated EAST search	9/21/2015	DM

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
G06N	99/00,005; 5/04,02,025	9/21/2015	DM

/DAVE MISIR/ Examiner.Art Unit 2129	

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
G06Q	30/0241	9/21/2015	DM
G06F	3/048	9/21/2015	DM
706	11-12	9/21/2015	DM

/DAVE MISIR/ Examiner.Art Unit 2129	

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	2	"20100138026"	US-PGPUB; USPAT	OR	ON	2015/03/31 16:25
S2	19	(kelly near2 phillipps).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/31 16:33
S3	29	(richard near2 wellman).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/31 16:34
S4	11	(purepredictive).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 09:52
S5	6	(cloudvu).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 09:56
S6	1	"20050054381"	US-PGPUB; USPAT	OR	ON	2015/04/01 10:04
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S10	1	"20130004930"	US-PGPUB; USPAT	OR	ON	2015/04/01 10:32
S11	2	"8260117"	US-PGPUB; USPAT	OR	ON	2015/04/01 10:38
S12	2	"20050090911"	US-PGPUB; USPAT	OR	ON	2015/04/01 10:42
S13	1	"20090222742"	US-PGPUB; USPAT	OR	ON	2015/04/01 10:51
S14	14	"7219085"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:01
S15	4	"7814194"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:08
S16	5	"8160981"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:11
S17	11	"6523015"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:12
S18	131	"6112304"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:17
S19	1	"20110119300"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:18
S20	6	"8209271"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:21

S21	7	"8209274"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:29
S22	10	"8229864"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:29
S23	11	"8250009"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:32
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S25	6	"8370279"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:39
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S32	2	"20120191630"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:47
S33	2	"20120284213"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:49
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S35	1	"20120284212"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:52
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S38	2	"20050132052"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:56
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S40	6	"8209271"	US-PGPUB; USPAT	OR	ON	2015/04/01 11:57
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S42	7	"8527324"	US-PGPUB; USPAT	OR	ON	2015/04/01 12:02
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S50	2	"20140136452"	US-PGPUB; USPAT	OR	ON	2015/04/01 14:39
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S53	24	"7689520"	US-PGPUB; USPAT	OR	ON	2015/04/01 14:42
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S55	2	"20120158620"	US-PGPUB; USPAT	OR	ON	2015/04/01 14:45
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S58	2	"20080313110"	US-PGPUB; USPAT	OR	ON	2015/04/01 14:51
S59	1	"20120330971"	US-PGPUB; USPAT	OR	ON	2015/04/01 14:51
S60	2	"20100145902"	US-PGPUB; USPAT	OR	ON	2015/04/01 14:53
S61	1	"20050278362"	US-PGPUB; USPAT	OR	ON	2015/04/01 14:58
S62	38	"7480640"	US-PGPUB; USPAT	OR	ON	2015/04/01 15:03
S63	36	"7499897"	US-PGPUB; USPAT	OR	ON	2015/04/01 15:04
S64	2	"20120284213"	US-PGPUB; USPAT	OR	ON	2015/04/01 15:52
S65	4880	706/11-12.ccls.	US-PGPUB; USPAT	OR	ON	2015/04/01 16:13
S66	15212	(g06n99/005;g06n5/04;g06n5/02;g06n5/025;g06n99/00;g06q30/0241;g06f3/048).cpc.	US-PGPUB; USPAT	OR	ON	2015/04/01 16:15
S67	8189	(predictive with (analytics or modeling))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 16:16
S68	129	(predictive with (analytics or modeling)) and (machine adj learning) and ((dynamic or predictive) with (user adj interface))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 16:18
S69	102	S68 and @ad<="20130529"	US-PGPUB; USPAT	OR	ON	2015/04/01 16:19
S70	9	S65 and S69	US-PGPUB; USPAT	OR	ON	2015/04/01 16:20
S71	5	S66 and S69	US-PGPUB; USPAT	OR	ON	2015/04/01 16:23
S72	319	(adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 16:31
S73	227	S72 and @ad<="20130529"	US-PGPUB; USPAT	OR	ON	2015/04/01 16:32
S74	31	S65 and S73	US-PGPUB; USPAT	OR	ON	2015/04/01 16:33
S75	31	S66 and S73	US-PGPUB; USPAT	OR	ON	2015/04/01 16:36
S76	8	((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 16:40
S77	4	S76 and @ad<="20130529"	US-PGPUB; USPAT	OR	ON	2015/04/01 16:40
S78	23	(predictive with (analytics or modeling)) and (machine adj learning) and ((dynamic or predictive) with (user adj interface)) and ((large with data with set) or (big adj data))	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2015/04/02 08:29

			EPO; JPO; DERWENT; IBM_TDB			
S79	18	S78 and @ad<="20130529"	US-PGPUB; USPAT	OR	ON	2015/04/02 08:30
S80	234	(permutat$4 or combinat$4 or variation) with (machine adj learning) with (result or parameter)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/02 08:42
S81	179	S80 and @ad<="20130529"	US-PGPUB; USPAT	OR	ON	2015/04/02 08:43
S82	18	((permutat$4 or combinat$4 or variation) with (machine adj learning) with (result or parameter)) and (predictive with (analytics or modeling))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/02 08:45
S83	14	S82 and @ad<="20130529"	US-PGPUB; USPAT	OR	ON	2015/04/02 08:45
S84	4	((permutat$4 or combinat$4 or variation) with (machine adj learning) with (result or parameter)) and (user with input with display$3 with updat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/02 08:50
S85	4887	706/11-12.ccls.	US-PGPUB; USPAT	OR	ON	2015/04/02 08:51
S86	38	S81 and S85	US-PGPUB; USPAT	OR	ON	2015/04/02 08:51
S87	15235	(g06n99/005;g06n5/04;g06n5/02;g06n5/025;g06n99/00;g06q30/0241;g06f3/048).cpc.	US-PGPUB; USPAT	OR	ON	2015/04/02 08:57
S88	32	S81 and S87	US-PGPUB; USPAT	OR	ON	2015/04/02 08:57
S89	15	(US-20140205990-$ or US-20140180738-$ or US-20100010948-$ or US-20120191631-$ or US-20080162487-$ or US-20050090911-$ or US-20090222742-$ or US-20120191630-$ or US-20120284213-$ or US-20100010878-$).did. or (US-8260117-$ or US-7480640-$ or US-7499897-$ or US-8229864-$ or US-8965814-$).did.	US-PGPUB; USPAT	OR	ON	2015/04/02 09:07
S90	0	S89 and ((machine adj learning) with result) and (user with input with (machine adj learning) with (value or parameter)) and (display with value or parameter) and (update with result)	US-PGPUB; USPAT	OR	ON	2015/04/02 09:12
S91	0	S89 and ((machine adj learning) with result) and (input with (machine adj learning) with (value or parameter)) and (display with value or parameter) and ((update or modify) with result)	US-PGPUB; USPAT	OR	ON	2015/04/02 09:15
S92	1	S89 and ((machine adj learning) with result) and (input with (machine adj learning) same (value or parameter)) and (display with value or parameter) and ((update or modify) with result)	US-PGPUB; USPAT	OR	ON	2015/04/02 09:15
S93	1	S89 and ((machine adj learning) same result) and (input with (machine adj learning) same (value or parameter)) and (display with value or parameter) and ((update or modify) same result)	US-PGPUB; USPAT	OR	ON	2015/04/02 09:17
S94	1	S89 and ((machine adj learning) same result) and (input with (machine adj learning) same (value or parameter)) and ((update or modify) same result)	US-PGPUB; USPAT	OR	ON	2015/04/02 09:18
S95	2	S89 and ((machine adj learning) same result) and (input with (machine adj learning) same (value or parameter))	US-PGPUB; USPAT	OR	ON	2015/04/02 09:18
S96	3	S89 and (machine adj learning) and (input with (machine adj learning) same (value or parameter))	US-PGPUB; USPAT	OR	ON	2015/04/02 09:19
S97	8	"8271536"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:52
S98	4	"8443438"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:52
S99	3	"8116207"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:53
S100	7	"7996415"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:53
S101	457	"6018619"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:53
S102	6	"3327291"	US-PGPUB;	OR	ON	2015/04/07

			USPAT			15:55
S103	12	"5719692"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:55
S104	38	"5832467"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:56
S105	267	"7023979"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:56
S106	36	"7600007"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:57
S107	2	"7890929"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:58
S108	1	"8572290"	US-PGPUB; USPAT	OR	ON	2015/04/07 15:59
S109	2	"20100131314"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:05
S110	1	"20110184575"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:05
S111	2	"20100138026"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:06
S112	1	"20020159641"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:06
S113	1	"20040078175"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:07
S114	2	"20050076245"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:07
S115	2	"20050267913"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:08
S116	1	"20060247973"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:08
S117	2	"20070043690"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:09
S118	2	"20070112824"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:10
S119	1	"20090089078"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:10
S120	1	"20090023798"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:11
S121	2	"20100138026"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:13
S122	1	"20110302153"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:13
S123	1	"20130218042"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:13
S124	2	"20140136452"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:15
S125	1	"20140180738"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:16
S126	1	"20140205990"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:16
S127	1	"20140195466"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:17
S128	1	"20140236875"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:18
S129	1	"20140358828"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:18
S130	1	"20140358825"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:19
S131	0	"201403752513"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:20
S132	1	"20140372513"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:20
S133	1	"20140372346"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:20
S134	1	"20150058266"	US-PGPUB; USPAT	OR	ON	2015/04/07 16:21
S135	2	"7328218"	US-PGPUB; USPAT	OR	ON	2015/09/15 09:41

S136	1	"20080168011"	US-PGPUB; USPAT	OR	ON	2015/09/15 09:53
S137	15	(US-20140205990-$ or US-20140180738-$ or US-20100010948-$ or US-20120191631-$ or US-20080162487-$ or US-20050090911-$ or US-20090222742-$ or US-20120191630-$ or US-20120284213-$ or US-20100010878-$).did. or (US-8260117-$ or US-7480640-$ or US-7499897-$ or US-8229864-$ or US-8965814-$).did.	US-PGPUB; USPAT	OR	ON	2015/09/15 10:48
S138	0	((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result)) same (without adj comput$3)) and (user with input with display$3 with updat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/09/15 10:53
S139	8	((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/09/15 10:54
S140	1	(((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/09/15 10:56
S143	5186	706/11-12.ccls.	US-PGPUB; USPAT	OR	ON	2015/09/21 10:40
S144	17113	(g06n99/005;g06n5/04;g06n5/02;g06n5/025;g06n99/00;g06q30/0241;g06f3/048).cpc.	US-PGPUB; USPAT	OR	ON	2015/09/21 10:42
S145	8	((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/09/21 10:42
S146	4	S143 and S145	US-PGPUB; USPAT	OR	ON	2015/09/21 10:43
S147	2	S144 and S145	US-PGPUB; USPAT	OR	ON	2015/09/21 10:43
S148	1	(((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/09/21 10:43

9/21/2015 11:11:29 AM
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EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S141	5	((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)	US-PGPUB; USPAT; UPAD	OR	ON	2015/09/15 10:56
S142	1	(((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2015/09/15 10:57
S149	5186	706/11-12.ccls.	US-PGPUB; USPAT; UPAD	OR	ON	2015/09/21 10:44
S150	17113	(g06n99/005;g06n5/04;g06n5/02;g06n5/025;g06n99/00;g06q30/0241;g06f3/048).cpc.	US-PGPUB; USPAT; UPAD	OR	ON	2015/09/21 10:44
S151	5	((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)	US-PGPUB; USPAT; UPAD	OR	ON	2015/09/21 10:44
S152	4	S149 and S151	US-PGPUB; USPAT; UPAD	OR	ON	2015/09/21 10:44
S153	2	S150 and S151	US-PGPUB; USPAT; UPAD	OR	ON	2015/09/21 10:45
S154	1	(((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)).clm.	US-PGPUB; USPAT; UPAD	OR	ON	2015/09/21 10:45

9/21/2015 11:11:46 AM
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7328218		2008-02-05	Steinberg, et al.	
	2	8229864		2012-07-24	Lin, et al.	
	3	8209271		2012-06-26	Lin, et al.	
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20080168011		2008-07-10	Steinberg	
	2	20120191631		2012-07-26	Breckenridge, et al.	
	3	20120158624		2012-06-21	Lingenfelder, et al.	
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Receipt date: 07/01/2015	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
(Not for submission under 37 CFR 1.99)	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2012151198	WO		2012-11-08	Google, Inc.		☐

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	STEINBERG, DAN, "CART 6.0", Salford Systems, 2006, pgs. 440, www.salford-systems, com	☐
	2	"SPM Features", Salford Systems - Data Mining and Predictive Analytics Software, downloaded April 30, 2015, pgs. 5, https://www.walford-systems, com/products/spm-features	☐
	3	Application No. PCT/US2013/070358, 3128.2.1PCT, International Preliminary Report on Patentability, May 28, 2015	☐

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Examiner Signature	/Daywayshwar Misir/	Date Considered	09/21/2015

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Receipt date: 07/01/2015	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2015-06-30
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	~~1~~	~~6491307~~		~~2005-09-06~~	~~Vossoler, et al.~~	Inventor name does not match patent number. Patent attributed to Miyasaka et al. /D.M./
	2	7996415		2011-08-09	Raffill, et al.	
	3	6894972		2005-05-17	Phaal	
	4	8271536		2012-09-18	Amradkar, et al.	
	5	9081805		2015-07-14	Stamen, et al.	
	6	3327291		1967-06-20	Lee	
	7	5719692		1998-02-17	Cohen	
	8	5832467		1998-11-03	Wavish	

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Receipt date: 10/09/2015	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
(Not for submission under 37 CFR 1.99)	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

	9	7023979		2006-04-04	Wu, et al.	
	10	7600007		2009-10-06	Lewis	
	11	7890929		2011-02-15	Johanson	
	12	8572290		2013-10-29	Mukhopadkyay, et al.	
	13	8880446		2014-11-04	Wellman, et al.	
	14	7689520		2010-03-30	Burges, et al.	
	15	8209274		2012-06-26	Lin, et al.	
	16	8209271		2012-06-26	Lin, et al.	
	17	8229864		2012-07-24	Lin, et al.	
	18	8214308		2012-07-03	Chu	
	19	8250009		2012-08-21	Breckenridge, et al.	

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Receipt date: 10/09/2015	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

	20	8311967		2012-11-13	Lin, et al.	
	21	8370280		2013-02-05	Lin, et al.	
	22	8370279		2013-02-05	Lin, et al.	
	23	8527324		2013-09-03	Richter	
	24	8880446		2014-11-04	Wellman, et al.	

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	1	20120143995		2012-06-07	Calvin, et al.	
	2	20110307889		2011-12-15	Moriki, et al.	
	3	20020184408		2002-12-05	Hannigan, et al.	
	4	20080043617		2008-02-21	Schekochikhin, et al.	

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Receipt date: 10/09/2015	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
(Not for submission under 37 CFR 1.99)	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

	5	20030097302		2003-05-22	Overhultz, et al.	
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.M./

Receipt date: 10/09/2015	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
(Not for submission under 37 CFR 1.99)	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

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(Not for submission under 37 CFR 1.99)	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

	27	20100023798		2010-01-28	Meijer, et al.	
	28	20100138026		2010-06-03	Kaushal, et al.	
	29	20110302153		2011-12-08	Meretakis, et al.	
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	45	20100131314		2010-05-27	Ting, et al.	
	46	20100223212		2010-09-02	Manolescu, et al.	
	47	20110111384		2011-05-12	Dietrich, et al.	
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	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

	49	20120004893		2012-01-05	Vaidyanathan, et al.	
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	1	2014110167	WO		2014-07-17	PurePredictive, Inc.		☐

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	1	Application No. 14/014,322, 3128.2.12, Office Action, August 27, 2015	☐
	2	Application No. 13/725,995, 3128.2.2, Office Action, September 24, 2015	☐
	3	ILIJASIC, LOVRO, "Computational Grids as Complex Networks", Torino, pgs. 130, 2010	☐
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	6	KOLTER, J. ZICO, "Dynamic Weighted Majority: An Ensemble Method for Drifting Concepts", Journal of Machine Learning Research, pgs. 36, December 2007	☐

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	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

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	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

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Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2015-10-02
Name/Print	Scott C. Hilton	Registration Number	66011

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13904963	PHILLIPPS ET AL.
	Examiner	**Art Unit**
	DAVE MISIR	2129

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/DAVE MISIR/ Examiner.Art Unit 2129	09/21/2015	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/JEFFREY A GAFFIN/ Supervisory Patent Examiner.Art Unit 2129	09/22/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1C

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13904963	PHILLIPPS ET AL.
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/DAVE MISIR/ Examiner.Art Unit 2129	09/21/2015	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/JEFFREY A GAFFIN/ Supervisory Patent Examiner.Art Unit 2129	09/22/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1C

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13904963	PHILLIPPS ET AL.
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(Assistant Examiner)	(Date)	25	
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(Primary Examiner)	(Date)	1	1C

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
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	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

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Receipt date: 08/17/2015	Application Number	13904963 13904963 - GAU: 2129
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(Not for submission under 37 CFR 1.99)	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

	1	PCT/US2013/077236 (3128.2.2PCT), International Preliminary Report on Patentability, July 2, 2015	☐
	2	PCT/US2014/013028 (3128.2.3PCT), International Preliminary Report on Patentability, August 6, 2015	☐
	3	PCT/US2014/010729 (3128.2.4PCT), International Preliminary Report on Patentability, July 23, 2015	☐

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Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2015-08-14
Name/Print	Scott C. Hilton	Registration Number	66011

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Attorney Docket Number	3128.2.5

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	1	6491367		2005-09-06	Vosseler, et al.	
	2	7996415		2011-08-09	Raffill, et al.	
	3	6894972		2005-05-17	Phaal	
	4	8271536		2012-09-18	Amradkar, et al.	
	5	9081805		2015-07-14	Stamen, et al.	
	6	3327291		1967-06-20	Lee	
	7	5719692		1998-02-17	Cohen	
	8	5832467		1998-11-03	Wavish	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

	9	7023979		2006-04-04	Wu, et al.	
	10	7600007		2009-10-06	Lewis	
	11	7890929		2011-02-15	Johanson	
	12	8572290		2013-10-29	Mukhopadkyay, et al.	
	13	8880446		2014-11-04	Wellman, et al.	
	14	7689520		2010-03-30	Burges, et al.	
	15	8209274		2012-06-26	Lin, et al.	
	16	8209271		2012-06-26	Lin, et al.	
	17	8229864		2012-07-24	Lin, et al.	
	18	8214308		2012-07-03	Chu	
	19	8250009		2012-08-21	Breckenridge, et al.	

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	20	8311967		2012-11-13	Lin, et al.	
	21	8370280		2013-02-05	Lin, et al.	
	22	8370279		2013-02-05	Lin, et al.	
	23	8527324		2013-09-03	Richter	
	24	8880446		2014-11-04	Wellman, et al.	

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	1	20120143995		2012-06-07	Calvin, et al.	
	2	20110307889		2011-12-15	Moriki, et al.	
	3	20020184408		2002-12-05	Hannigan, et al.	
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	5	20030097302		2003-05-22	Overhultz, et al.	
	6	20030088425		2003-05-08	Lam, et al.	
	7	20090177646		2009-07-09	Pham, et al.	
	8	20110265069		2011-10-27	Fee, et al.	
	9	20120079134		2012-03-29	Outhred, et al.	
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	13	20110184575		2011-07-28	Kawamoto, et al.	
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	16	20040059966		2004-03-25	Chan, et al.	
	17	20040078175		2004-04-22	Shaw, et al.	
	18	20050076245		2005-04-07	Graham, et al.	
	19	20050132052		2005-06-16	Uttamchandani, et al.	
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	21	20050267913		2005-12-01	Stienhans, et al.	
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	23	20070043690		2007-02-22	Inakoshi, et al.	
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	25	20090089078		2009-04-02	Bursey	
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	27	20100023798		2010-01-28	Meijer, et al.	
	28	20100138026		2010-06-03	Kaushal, et al.	
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	30	20130218042		2013-08-22	Mardirossian	
	31	20140136452		2014-05-15	Wellman, et al.	
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	36	20140358828		2014-12-04	Phillipps, et al.	
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	38	20140372513		2014-12-18	Jones	
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	43	20090254379		2009-10-08	Adams, et al.	
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	57	20120284213		2012-11-08	Lin, et al.	
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	59	20140136452		2014-05-15	Wellman, et al.	

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	1	2014110167	WO		2014-07-17	PurePredictive, Inc.		☐

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. 14/014,322, 3128.2.12, Office Action, August 27, 2015	☐
	2	Application No. 13/725,995, 3128.2.2, Office Action, September 24, 2015	☐
	3	ILIJASIC, LOVRO, "Computational Grids as Complex Networks", Torino, pgs. 130, 2010	☐
	4	"HP Process Resource Manager User's Guide Version C.03.05", Hewlett-Packard Development Company, pgs. 111, January 2009	☐
	5	Application No. 14/531,893, 3128.2.1US1-CON, Office Action, September 25, 2015	☐
	6	KOLTER, J. ZICO, "Dynamic Weighted Majority: An Ensemble Method for Drifting Concepts", Journal of Machine Learning Research, pgs. 36, December 2007	☐

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	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2015-10-02
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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EFS ID:	23678099
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	09-OCT-2015
Filing Date:	29-MAY-2013
Time Stamp:	00:04:08
Application Type:	Utility under 35 USC 111(a)

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Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS14coversheet.pdf	48837 a9fb398bde418588638b6c28f7fde32ad49c4a6f	no	2
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2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS14.pdf	614837 90a75f3c3823f65a6bbac12bc01f96ddec3447b4	no	12
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3	Non Patent Literature	3128_2_1US1-CON_OfficeAction_09-25-15.pdf	1806914 73b7e10504be2b6b5b7d3911decb39defa4a8705	no	17
Warnings:					
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4	Non Patent Literature	3128_2_2_FinalOfficeAction_09-24-15.pdf	1774075 7284d3d7a1fd10086f08e429adf82b7aa6528a8f	no	17
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5	Non Patent Literature	3128_2_12_OfficeAction_08-27-15.pdf	1998231 baf0355d83f565cc1c2c7dcef40462349a35b580	no	23
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6	Non Patent Literature	ComputationalGrids.pdf	12403122 e46c0492d282089068df9524d9d0203460e67ed8	no	130
Warnings:					
Information:					
7	Non Patent Literature	HP_ProcessResourceManager.pdf	10239114 c078ae8cf49894ef9b2ff00481257be7f6203a7d	no	310
Warnings:					
Information:					
8	Non Patent Literature	kolter_DynamicWeighted.pdf	19395635 83c616fba4a05edccd63d4ab729a3c3917d0f69e	no	36
Warnings:					
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9	Foreign Reference	WO2014110167A2.pdf	2928088 c10898d2814016c01a32d23391810f0ca44b6b56	no	60
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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2129 Examiner: Daywayshwar D. Misir

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

____ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

__X__ under 37 CFR 1 .97(c) together with either a:
__X__ Statement under 37 CFR 1.97(e), or
____ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

____ under 37 CFR 1.97(d) together with a:
_____ Statement under 37 CFR 1.97(e), and
_____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

__X__ under 37 CFR 1.97(e),

____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

__X__ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: October 2, 2015
50 West Broadway, 10th Floor
Salt Lake City, UT 84101
Telephone (801) 994-4646
Fax (801) 531-1929

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/904,963	05/29/2013	Kelly D. Phillipps	3128.2.5	6149

36491 7590 09/22/2015

Kunzler Law Group
50 W. Broadway
10th Floor
SALT LAKE CITY, UT 84101

EXAMINER	
MISIR, DAYWAYSHWAR D	

ART UNIT	PAPER NUMBER
2129	

NOTIFICATION DATE	DELIVERY MODE
09/22/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@kunzlerlaw.com

Applicant-Initiated Interview Summary	**Application No.** 13/904,963	**Applicant(s)** PHILLIPPS ET AL.	
	Examiner DAVE MISIR	**Art Unit** 2129	

All participants (applicant, applicant's representative, PTO personnel):

(1) *DAVE MISIR*. (3)_____.

(2) *Scott Hilton (Reg. No. 66011)*. (4)_____.

Date of Interview: *15 September 2015*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☒101 ☒112 ☐102 ☐103 ☒Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1-4,17 and 22*.

Identification of prior art discussed: *Ingargiola, Breckenridge '630 and '631*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicants' representative discussed the proposed three amendments to the independent claims. It was pointed out that these three amendments should be combined along with elaboration on the precompute module (that is discussed in claims 2-4) in dynamically updating the user interface, as well as the machine learning factory as pointed out in the specified paragraphs of the specification, in order for the application to be placed in a position for possible allowance. Amendments to negate 35 USC 101 issues on Claims 1-16 and 22-26 were also discussed.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/DAVE MISIR/ Examiner, Art Unit 2129	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by either electronic submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on September 15, 2015.

/Scott C. Hilton/
Attorney for Applicants

PATENT
Docket No. 3128.2.5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Kelly D. Phillipps, et al.	
Serial No.:	13/904,963	
Filed:	May 29, 2013	Group Art Unit: 2129
For:	USER INTERFACE FOR MACHINE LEARNING	
Examiner:	Daywayshwar D. Misir	

AMENDMENT AND RESPONSE TO OFFICE ACTION

Mailstop: Amendments
Commissioner for Patents and Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Examiner:

Applicants wish to express their appreciation for the Examiner's attention to this application and for the telephone interview held on September 15, 2015. In response to the Office Action mailed on May 15, 2015, Applicants respectfully request the reconsideration of the present application in view of the following amendments and remarks.

Amendments to the Claims

Please make the following amendments to the Claims:

1. (Currently Amended) An apparatus for machine learning results, the apparatus comprising:

a predictive compiler module configured to generate machine learning comprising program code for a plurality of learned functions, the program code generated by the predictive compiler module to predict one or more machine learning results based on one or more machine learning parameters;

an input module configured to receive user input identifying one or more values for the one or more machine learning parameters;

a pre-compute module configured to predetermine, using the generated machine learning, permutations of the machine learning results at one or more increments between a minimum value and a maximum value for the one or more machine learning parameters, prior to the input module receiving the user input;

a display module configured to display, from the pre-compute module, a first predetermined permutation of the one or more predicted machine learning results for the one or more identified machine learning parameters~~, the one or more machine learning results determined using machine learning~~; and

an update module configured to dynamically ~~update the displayed~~ display, from the pre-compute module, a second permutation of the one or more machine learning results in response to the input module receiving additional user input identifying one or more additional values for the one or more machine learning parameters,

wherein the predictive compiler module, the input module, the pre-compute module, the display module, and the update module comprise one or more of logic hardware and a non-transitory computer readable storage medium storing program code executable by a processor.

2. (Cancelled)

3. (Currently Amended) The apparatus of claim [[2]] 1, wherein the pre-compute module is configured to cache the predetermined permutations of the machine learning results for the update module in a results data structure indexed by the one or more machine learning parameters.

4. (Currently Amended) The apparatus of claim 3, wherein the ~~pre-compute~~ update module is configured to determine the second permutation of the one or more machine learning results by looking up the second permutation of the one or more machine learning results in the results data structure using the one or more additional values for the one or more machine learning parameters.

5. (Original) The apparatus of claim 1, wherein the display module is configured to display one or more attributes of a data set used by the machine learning to determine the one or more machine learning results and one or more impact metrics for each displayed attribute.

6. (Currently Amended) The apparatus of claim 1, ~~further comprising a predictive compiler module configured to generate the machine learning, the machine learning comprising program code for a~~ wherein the plurality of learned functions are from multiple machine learning classes~~, the program code generated by the predictive compiler module to predict the machine learning results based on the one or more machine learning parameters~~.

7. (Original) The apparatus of claim 1, further comprising a recommendation module configured to select a suggested set of machine learning results, the display module configured to display the suggested set of machine learning results to the user prior to the input module receiving the user input.

8. (Currently Amended) The apparatus of claim 1, wherein the one or more machine learning parameters comprise one or more of an input and an output of the machine learning adjusted by the user input and the machine learning results comprise one or more of an input and an output of the machine learning determined based on the ~~adjusted~~ one or more machine learning parameters.

9. (Original) The apparatus of claim 1, wherein the one or more machine learning parameters comprise one or more of an attribute of a feature, a target value for a goal, an action relating to a goal, a confidence metric, and a target of an action.

10. (Original) The apparatus of claim 1, wherein the machine learning results comprise one or more of an attribute of a feature, a target value for a goal, an action relating to a goal, a confidence metric, and a target of an action.

11. (Original) The apparatus of claim 1, wherein the input module is configured to receive the user input as an adjustment to a slider graphical user interface element corresponding to the one or more machine learning parameters.

12. (Original) The apparatus of claim 1, wherein the input module is configured to receive the user input as a user entry in a graphical table and the display module is configured to display the one or more machine learning results as entries in the graphical table.

13. (Original) The apparatus of claim 1, wherein the input module is configured to receive the user input as a user manipulation of a displayed object.

14. (Original) The apparatus of claim 13, wherein the user input comprises one or more of:

an adjustment to a size of the displayed object;

an adjustment to a vertical position of the displayed object;

an adjustment to a horizontal position of the displayed object;

an adjustment to an opacity of the displayed object;

an adjustment to a color of the displayed object;

an adjustment to a shape of the displayed object;

an adjustment to shading of the displayed object;

a text entry in a text box for the displayed object; and

user interaction with an animation for the displayed object.

15. (Original) The apparatus of claim 1, further comprising a collaboration module configured to determine an impact on the one or more machine learning results based on different user input received from a different user.

16. (Original) The apparatus of claim 15, wherein the input module is configured to receive the different user input from the different user, the different user input identifying a different value for a different machine learning parameter, the display module configured to display multiple sets of one or more machine learning results to multiple users, and the update module configured to dynamically update the displayed multiple sets of one or more machine learning results.

17. (Currently Amended) A method for machine learning results, the method comprising:

generating a predictive program comprising a plurality of learned functions from multiple machine learning classes;

inputting permutations of machine learning parameters incrementally between minimum values for the machine learning parameters and maximum values for the machine learning parameters into [[a]] the predictive program;

determining machine learning results from the predictive program for the input permutations of the machine learning parameters; [[and]]

populating a results data structure with the determined machine learning results indexed by the machine learning parameters;

dynamically changing a display of one or more input permutations of the machine learning parameters from the results data structure in response to user input adjusting a displayed value for one or more of the machine learning results from the predictive program.

18. (Original) The method of claim 17, wherein the results data structure is populated prior to receiving user input identifying a value for a machine learning parameter.

19. (Currently Amended) The method of claim 17, further comprising dynamically changing a display[[ing]] of one or more of the ~~corresponding machine learning parameters and~~ machine learning results from the results data structure in response to user input selecting a value for ~~one or more of~~ a machine learning parameter ~~and a machine learning result~~.

20. (Currently Amended) The method of claim [[19]] 17, further comprising ~~dynamically changing the displayed one or more corresponding machine learning parameters and machine learning results using the results data structure in response to user input adjusting a value for a machine learning parameter~~ determining, from the results data structure, an impact on machine learning results from a different predictive program caused by the user input adjusting the displayed value for the one or more of the machine learning results.

21. (Currently Amended) The method of claim [[19]] 20, further comprising: ~~dynamically changing the displayed one or more corresponding machine learning parameters and machine learning results using the results data structure in response to user input adjusting a value for a machine learning result~~ displaying the impact on machine learning results from the different predictive program.

22. (Currently Amended) A system for machine learning results, the system comprising:

a predictive compiler module configured to generate a plurality of predictive programs each comprising a plurality of learned functions;

a pre-compute module configured to predetermine, using ~~one or more~~ the predictive programs, permutations of machine learning results for each of the ~~one or more~~ predictive programs at predefined increments between minimum values for machine learning parameters and maximum values for the machine learning parameters;

an input module configured to receive user input from ~~multiple~~ one or more users identifying one or more values for one or more of the machine learning parameters for a first subset of the ~~one or more~~ predictive programs;

a collaboration module configured to determine, using the predetermined permutations of machine learning results, an impact on machine learning results from a different one of the predictive programs based on the one or more identified values for the one or more of the machine learning parameters for the first subset of the predictive programs; and

a display module configured to display ~~one or more of the predetermined~~ at least the impact on the machine learning results to the ~~multiple~~ one or more users ~~based on the identified values,~~

wherein the predictive compiler module, the pre-compute module, the input module, the collaboration module, and the display module comprise one or more of logic hardware and a non-transitory computer readable storage medium storing program code executable by a processor.

23. (Currently Amended) The system of claim 22, further comprising ~~a collaboration~~ an update module configured to dynamically update the display of the at least the impact on the machine learning results, using the predetermined permutations of the machine learning results, in response to the one or more users identifying one or more different values for one or more of the machine learning parameters ~~determine an impact on machine learning results from one of the predictive programs based on an identified value for a machine learning parameter for another of the predictive programs~~.

24. (Currently Amended) The system of claim [[23]] 22, wherein the one or more users comprise multiple users, the one or more values comprise multiple values, and the multiple users identify the multiple values for different predictive programs of the first subset of the predictive programs.

25. (Original) The system of claim 24, wherein the display module is configured to display the impact on the machine learning results on a shared display for the multiple users and to display the machine learning results for the different predictive programs on different displays for the multiple users.

26. (Currently Amended) The system of claim [[22]] 24, wherein the input module is configured to receive the user input from one or more of:

separate client devices for the multiple users over a data network; and

a shared interface for the multiple users on a single device.

INTERVIEW SUMMARY

[0001] Applicant thanks Examiner Daywayshwar D. Misir for his time and suggestions in a telephonic interview which took place on September 15, 2015, with Applicant's representative Scott C. Hilton, Reg. No. 66,011. The discussion and feedback were very helpful.

[0002] Applicant's representative proposed amendments and pointed out differences between the claims and the cited references. The Examiner suggested clarifying the generation of the machine learning and the predetermination of the results and their use, in addition to the proposed amendments. The Examiner also suggested amendments to Claims 1 and 22 to prevent a rejection under 35 U.S.C. § 101.

[0003] The Examiner agreed that such an amendment would likely overcome the present rejections, but stated that additional searching and review of the art will be necessary. Applicant's representative agreed to make the proposed and suggested amendments and has done so presently, and the Examiner agreed to telephone Applicant's representative should any further obstacles to allowance of the present case present themselves.

REMARKS

[0001] Claims 1 and 3-26 are pending. The Office Action mailed May 15, 2015 [hereinafter "Office Action"] rejected Claim 8 under 35 U.S.C. § 112 as being indefinite. The Office Action rejected Claims 1-14 and 17-22 under 35 U.S.C. § 103 as being unpatentable over Ingargiola et al., U.S. Patent Application No. 205/0090911 [hereinafter "*Ingargiola*"]. The Office Action rejected Claims 15-16 and 23-24 under 35 U.S.C. § 103 as being unpatentable over *Ingargiola* in view of Xu et al., U.S. Patent No. 8,260,117 [hereinafter "*Xu*"]. The Office Action rejected Claim 25 under 35 U.S.C. § 103 as being unpatentable over *Ingargiola* in view of *Xu* and Pelton et al, U.S. Patent Application No. 2009/0222742 [hereinafter "*Pelton*"]. The Office Action rejected Claim 26 under 35 U.S.C. § 103 as being unpatentable over *Ingargiola* in view of *Pelton*.

[0002] Claims 1, 3-4, 6, 8, 17, 19-24, and 26 are amended. Claim 2 has been cancelled. The amendments are supported by at least paragraphs [0045], [0047]-[0054]-[0060], [0070]-[0073], [0095], [0097], [0101], [0103]-[0106], [0111]-[0112], [0172]-[0176], and [0182]-[0184] of the Application as filed and no new matter has been added.

[0003] Applicants' use of "non-transitory" is to be understood to remove only propagating transitory signals per se from the claim scope. As such, Applicants do not relinquish rights to any standard computer-readable medium, except those that are solely propagating transitory signals per se. Thus, the meaning of "non-transitory computer readable storage medium" should be construed to exclude only those types of transitory computer-readable media which were found in Nuijten to fall outside the scope of patentable subject matter under 35 U.S.C. § 101. See In re Nuijten, 500 F.3d 1346 (Fed. Cir. 2007).

RESPONSE TO CLAIM REJECTIONS UNDER 35 U.S.C. § 112

[0004] The Office Action rejected Claim 8 under 35 U.S.C. § 112 as being indefinite. Accordingly, Applicant has removed the objected to use of "adjusted" from line 4 of Claim 8. Applicant respectfully requests that the rejection of Claim 8 under 35 U.S.C. § 112 be removed.

RESPONSE TO CLAIM REJECTIONS UNDER 35 U.S.C. § 103

[0005] The Office Action rejected Claims 1-26 under 35 U.S.C. § 103 as being unpatentable over *Ingargiola* in view of various combinations of *Xu* and *Pelton*. Applicant respectfully traverses this rejection, but has amended the claims at issue to facilitate expeditious prosecution, as suggested by the Examiner and agreed upon in the telephone interview.

[0006] As agreed upon in the telephone interview, Applicant has amended independent Claim 1 to recite "a predictive compiler module configured to generate machine learning comprising program code for a plurality of learned functions, the program code generated by the predictive compiler module to predict one or more machine learning results based on one or more machine learning parameters" and "a pre-compute module configured to predetermine, using the generated machine learning, permutations of the machine learning results at one or more increments between a minimum value and a maximum value for the one or more machine learning parameters, prior to the input module receiving the user input" with corresponding limitations in independent Claims 17 and 22.

[0007] Claim 17 is further amended to recite "dynamically changing a display of one or more input permutations of the machine learning parameters from the results data structure in response to user input adjusting a displayed value for one or more of the machine learning results from the predictive program" and Claim 22 is further amended to recite "a collaboration module configured to determine, using the predetermined permutations of machine learning results, an impact on machine learning results from a different one of the predictive programs based on the one or more identified values for the one or more of the machine learning parameters for the first subset of the predictive programs." Applicant respectfully submits that the claims at issue, especially in light of the present amendments, are not taught, suggested, or rendered obvious by the *Ingargiola*, *Xu*, and *Pelton* references.

Claims 1, 17, 22 – Predetermining the Machine Learning Results

[0008] The Office Action suggests that *Ingargiola* teaches "the re-specifying or modifying of parameters that necessarily updates the machine learning results" and

"preprocessing and predicting, based on raw data and indicators and advisors, which are machine learning based components…which is necessarily a permutation/combination of time series data between specified minimum and maximum ranges." Office Action, pp. 4-5. Applicant respectfully disagrees.

[0009] The amendment to Claim 1 recites "a pre-compute module configured to predetermine, using the generated machine learning, permutations of the machine learning results at one or more increments between a minimum value and a maximum value for the one or more machine learning parameters, prior to the input module receiving the user input," Claim 17 recites "inputting permutations of machine learning parameters incrementally between minimum values for the machine learning parameters and maximum values for the machine learning parameters into the predictive program; determining machine learning results from the predictive program for the input permutations of the machine learning parameters; [and] populating a results data structure with the determined machine learning results indexed by the machine learning parameters," and Claim 22 recites "a pre-compute module configured to predetermine, using the predictive programs, permutations of machine learning results for each of the predictive programs at predefined increments between minimum values for machine learning parameters and maximum values for the machine learning parameters," in addition to each reciting the generation of the machine learning or predictive programs as suggested by the Examiner.

[0010] The *Ingargiola* reference teaches "(GUI) controls and displays" that a user may use to "select the types of raw data to use, the instruments, the factors, the data feeds and other sources for data, the indicators that perform processing and the advisors that perform analysis, grouping and outputting of results,…modeling frequency, scheduled processing, whether the system is running a simulation or is designed for higher performance execution." *Ingargiola*, Abstract. In paragraphs [0096], [0119], [0123], [0182], [0186], [0189], the *Ingargiola* reference teaches that a user may modify "indicator parameters," identify a "signal generating strategy element" or "specify its use," "associate particular advisors with the instrument and/or factor groupings," "specify their preferred optimization parameters," "fine-tune the learning optimization," "establish advanced parameters," specify an "evaluation criterion" or "the

system's settings," and may "specify the portion of the operative portfolio that they wish to modify."

[0011] Nothing in *Ingargiola* suggests that displayed results are dynamically updated based on user input, much less that "permutations of the machine learning results" are "predetermine[d], using the generated machine learning…at one or more increments between a minimum value and a maximum value for the one or more machine learning parameters, prior to the input module receiving the user input" as recited in amended Claim 1. The only "pre-processing" mentioned in Ingargiola is "instrument and factor raw data…used to derive other data called 'indicators'" which may later be "used as inputs to process called 'advisors,' which can include one or more machine learning based components." *Id.* at ¶ [0047].

[0012] Since even the "indicators can use parameters that are set by a user," not even the inputs into the machine learning based "advisors" in *Ingargiola* may be performed without the user input, making it impossible for the advisors of *Ingargiola* to predetermine values prior to receiving the user input. *Id.* at ¶ [0055]. *Elad*, *Pinto*, and *Breckenridge* (see Office Action, p. 5) also fail to teach predetermining machine learning results for dynamically updating displayed machine learning results based on user input.

Claim 17 – Changing Display of Input based on User Adjusting Results

[0013] In addition to the limitations described above, independent Claim 17 is amended to recite "dynamically changing a display of one or more input permutations of the machine learning parameters from the results data structure in response to **user input adjusting a displayed value for one or more of the machine learning results** from the predictive program." (Emphasis added).

[0014] *Ingargiola* teaches that a user may specify certain parameters and settings, as described above. However, *Ingargiola* fails to teach "user input adjusting a displayed value for one or more of the machine learning results from the predictive program" or "dynamically changing a display of one or more input permutations of the machine learning parameters" in response, as recited in amended Claim 17. In this manner, a user may adjust values for a desired result, and easily see what input parameters may provide the desired result. Applicant

respectfully submits that none of the cited reference teach or suggest allowing a user to adjust a machine learning result, the output of a predictive program, nor could they, as the cited references also fail to teach or suggest predetermining machine learning results, as described above.

Claim 22 – Determining/Displaying Impact of Change to One Predictive Program in Another

[0015] *Ingargiola* further fails to teach "a collaboration module configured to determine, using the predetermined permutations of machine learning results, an impact on machine learning results from a different one of the predictive programs based on the one or more identified values for the one or more of the machine learning parameters for the first subset of the predictive programs," as recited in independent Claim 22, in addition to the limitations described above.

[0016] In this manner, a user may identify a value for a machine learning parameter for a predictive program (e.g., for one department in a company) and easily see the impact on machine learning results for a different predictive program (e.g., for a different department in the company), dynamically displayed based on predetermined machine learning results. Further, in certain embodiments, multiple users may identify values for different predictive programs, and view the impacts of the identified values on another predictive program, as recited in dependent Claim 24.

[0017] Applicant respectfully submits that the *Ingargiola*, *Xu*, *Pelton*, *Elad*, *Pinto*, and *Breckenridge* references combined fail to teach or disclose each element of the claims as required under 35 U.S.C. § 103. Applicant respectfully asserts that independent Claims 1, 17, and 22 are in condition for allowance. Claims 3-16, 18-21, and 23-26 depend on independent Claims 1, 17, and 22. Because Claims 1, 17, and 22 are not obvious in relation to the *Ingargiola*, *Xu*, *Pelton*, *Elad*, *Pinto*, and *Breckenridge* references, Applicant respectfully asserts that Claims 3-16, 18-21, and 23-26 are similarly in condition for allowance because they depend from allowable claims. See in re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

CONCLUSION

[0018] Applicant has amended Claims 1, 3-4, 6, 8, 17, 19-24, and 26 and cancelled Claim 2 from further consideration. Applicant is not conceding in this Application that those claims are not patentable over the art cited by the Examiner, as the present claim amendments and cancellations are only for facilitating expeditious prosecution of allowable subject matter. Applicant respectfully reserves the right to pursue these and other claims in one or more continuations and/or divisional patent applications.

[0019] Should additional information be required, the Examiner is respectfully asked to notify Applicant of such need. If any impediments to the prompt allowance of the claims can be resolved by a telephone conversation, the Examiner is respectfully requested to contact the undersigned.

Respectfully submitted,

/Scott C. Hilton/

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Reg. No. 66,011
Attorney for Applicant

Kunzler Law Group, PC
Date: September 15, 2015
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Electronic Patent Application Fee Transmittal	
Application Number:	13904963
Filing Date:	29-May-2013
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Filer:	Scott C. Hilton/Vicki Crist
Attorney Docket Number:	3128.2.5
Filed as Small Entity	
Filing Fees for Utility under 35 USC 111(a)	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	2251	1	100	100
Miscellaneous:				
		Total in USD ($)		**100**

Electronic Acknowledgement Receipt	
EFS ID:	23502758
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	15-SEP-2015
Filing Date:	29-MAY-2013
Time Stamp:	23:13:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$100
RAM confirmation Number	6705
Deposit Account	506258
Authorized User	HILTON, SCOTT
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		3128_2_5_OAR.pdf	102286 e92df0a1758efbf8ce857146e7848a2018b21c12	yes	17

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	10
	Applicant summary of interview with examiner	11	11
	Applicant Arguments/Remarks Made in an Amendment	12	17

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30588 f3a2d028bc6df70be520e5b4b63eeb0f5d00afe2	no	2

Warnings:

Information:

Total Files Size (in bytes):	132874

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/904,963	Filing Date 05/29/2013	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	09/15/2015	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 25	Minus	** 26	= 0	X $40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/DAWN BREWER/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

	1	PCT/US2013/077236 (3128.2.2PCT), International Preliminary Report on Patentability, July 2, 2015	☐
	2	PCT/US2014/013028 (3128.2.3PCT), International Preliminary Report on Patentability, August 6, 2015	☐
	3	PCT/US2014/010729 (3128.2.4PCT), International Preliminary Report on Patentability, July 23, 2015	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2015-08-14
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt	
EFS ID:	23176469
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	17-AUG-2015
Filing Date:	29-MAY-2013
Time Stamp:	14:05:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	3128_2_2pct_IPRP_07-02-15.pdf	1333068 0f72b7103584cf5f480ab8d3096a0c49f7d87439	no	9

Warnings:
Information:

2	Non Patent Literature	3128_2_3pct_IPRP_08-06-15.pdf	2450126 03ade699b8402d873e5b51b0fe7cce6c91453400	no	12
Warnings:					
Information:					
3	Non Patent Literature	3128_2_4pct_IPRP_07-23-15.pdf	517657 4109f059206fb1ef7b79375ae4a414a80a2d70f1	no	8
Warnings:					
Information:					
4	Transmittal Letter	3128_2_5_IDS13CoverSheet.pdf	49025 50b5e3577b53453ced8ee52961efd84d1a098345	no	2
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS13.pdf	612351 2cc63624d86dcd2960e090ec32a71e8ff17b9767	no	4
Warnings:					
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A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

Total Files Size (in bytes):	4962227

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING TRANSMITTAL OF COPY OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (CHAPTER I OF THE PATENT COOPERATION TREATY)
(PCT Rule 44bis.1(c))

To:

HILTON, Scott, C.
8 East Broadway
Suite 600
Salt Lake City, Utah 84111
ETATS-UNIS D'AMERIQUE

Date of mailing *(day/month/year)* 02 July 2015 (02.07.2015)	
Applicant's or agent's file reference 3128-2-2pct	**IMPORTANT NOTICE**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2013/077236	20 December 2013 (20.12.2013)	21 December 2012 (21.12.2012)

Applicant
PUREPREDICTIVE, INC.

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. +41 22 338 82 70

Authorized officer
Agnès Wittmann-Regis

e-mail: pt06.pct@wipo.int

Form PCT/IB/326 (January 2004)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 3128-2-2pct	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2013/077236	International filing date *(day/month/year)* 20 December 2013 (20.12.2013)	Priority date *(day/month/year)* 21 December 2012 (21.12.2012)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant PUREPREDICTIVE, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 23 June 2015 (23.06.2015)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Agnès Wittmann-Regis e-mail: pt06.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
HILTON, SCOTT C.

8 EAST BROADWAY SUITE 600 SALT LAKE CITY UT 84111 USA

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)*	**24 February 2014 (24.02.2014)**
Applicant's or agent's file reference: 3128-2-2PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2013/077236	**20 December 2013 (20.12.2013)**	21 December 2012 (21.12.2012)

International Patent Classification (IPC) or both national classification and IPC

G06F 15/18(2006.01)i

Applicant

PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR	Date of completion of this opinion	Authorized officer
International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea Facsimile No. +82-42-472-7140	21 February 2014 (21.02.2014)	Park, Sung Cheol Telephone No. +82-42-481-5696

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/077236

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of :

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

   ☐ on paper

   ☐ in electronic form

   b. (time)

   ☐ in the international application as filed.

   ☐ together with the international application in electronic form.

   ☐ subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additioanl copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/077236

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-30	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-30	NO
Industrial applicability (IA)	Claims	1-30	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:
D1: US 2009-0327172 A1 (LIU YAN et al.) 31 December 2009
D2: US 2004-0059966 A1 (HOI YEUNG CHAN et al.) 25 March 2004
D3: US 2005-0132052 A1 (SANDEEP UTTAMCHANDANI et al.) 16 June 2005
D4: US 2005-0228789 A1 (TOM FAWCETT et al.) 13 October 2005

A. Novelty and Inventive Step

1. Claims 1-7

1.1 Independent Claim 1

D1, which is considered to represent the most relevant state of the art, discloses a method for selection of a machine learning algorithm comprising: receiving as an input a state of at least one problem and at least one context associated with the problem; selecting a machine learning algorithm based on the problem and context of the problem that have been received; outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 1 in receiving user information and systems management data. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 1 would have been obvious over D1 in view of D2. Therefore, claim 1 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

1.2 Dependent Claims 2-7

Continued on Supplemental Box

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of : Box No. V

Claims 2-7 are dependent on claim 1.
The additional feature of claim 2 is identical to knowledge base of rules in D2.
The additional feature of claim 3 is identical to performance measures in D2.
The additional features of claims 4,5 are identical to a status of the computing environment in D2.
The additional feature of claim 6 is identical to performing reinforcement learning with respect to selecting a machine learning algorithm in D1.
The additional feature of claim 7 is identical to event logs in D2.

Therefore, claims 2-7 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

2. Claims 8-11

2.1 Independent Claim 8

D1, which is considered to represent the most relevant state of the art, discloses a method for selection of a machine learning algorithm comprising: receiving as an input a state of at least one problem and at least one context associated with the problem; selecting a machine learning algorithm based on the problem and context of the problem that have been received; outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 8 in receiving user information and incident management data. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 8 would have been obvious over D1 in view of D2. Therefore, claim 8 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

2.2 Dependent Claims 9-11

Claims 9-11 are dependent on claim 8.
The additional feature of claim 9 is identical to event logs in D2.

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The additional feature of claim 10 is identical to awarding a reinforcement value to a selection of at least machine learning algorithm in D1.
The additional feature of claim 11 is identical to performing reinforcement learning with respect to selecting a machine learning algorithm in D1.

Therefore, claims 9-11 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

3. Claims 12-15

3.1 Independent Claim 12

D1, which is considered to represent the most relevant state of the art, discloses a system for selecting a machine learning algorithm comprising: receiving as an input a state of at least one problem and at least one context associated with the problem; selecting a machine learning algorithm based on the problem and context of the problem that have been received; outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 12 in receiving systems management data. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 12 would have been obvious over D1 in view of D2. Therefore, claim 12 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

3.2 Dependent Claims 13-15

Claims 13-15 are dependent on claim 12.
The additional features of claims 13-15 are identical to performing reinforcement learning with respect to selecting a machine learning algorithm and awarding a reinforcement value to a selection of at least machine learning algorithm in D1.

Therefore, claims 13-15 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

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4. Claims 16-24

4.1 Independent Claim 16

D1, which is considered to represent the most relevant state of the art, discloses a method for selection of a machine learning algorithm comprising: receiving as an input a state of at least one problem and at least one context associated with the problem; selecting a machine learning algorithm based on the problem and context of the problem that have been received; outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 16 in identifying a business activity based on input from a user. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 16 would have been obvious over D1 in view of D2. Therefore, claim 16 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

4.2 Dependent Claims 17-24

Claims 17-24 are dependent on claim 16.
The additional features of claims 17-20 are identical to performing reinforcement learning with respect to selecting a machine learning algorithm and awarding a reinforcement value to a selection of at least machine learning algorithm in D1.
The additional features of claims 21-24 are identical to performance measures in D2.

Therefore, claims 17-24 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

5. Claims 25-30

5.1 Independent Claim 25

D1, which is considered to represent the most relevant state of the art, discloses a method for selection of a machine learning algorithm comprising: receiving as an

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input a state of at least one problem and at least one context associated with the problem; selecting a machine learning algorithm based on the problem and context of the problem that have been received; outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 25 in receiving user information and systems management data. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 25 would have been obvious over D1 in view of D2. Therefore, claim 25 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

5.2 Dependent Claims 26-30

Claims 26-30 are dependent on claim 25.
The additional features of claims 26-28 are identical to awarding a reinforcement value to a selection of at least machine learning algorithm in D1.
The additional features of claims 29 are identical to a status of the computing environment in D2.
The additional feature of claim 30 is identical to performing reinforcement learning with respect to selecting a machine learning algorithm in D1.

Therefore, claims 26-30 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

B. Industrial Applicability

Claims 1-30 have industrial applicability and meet the requirement of PCT Article 33(4).

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING TRANSMITTAL OF COPY OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (CHAPTER I OF THE PATENT COOPERATION TREATY)
(PCT Rule 44bis.1(c))

To:

HILTON, Scott, C.
8 East Broadway
Suite 600
Salt Lake City, Utah 84111
ETATS-UNIS D'AMERIQUE

Date of mailing *(day/month/year)* 06 August 2015 (06.08.2015)	
Applicant's or agent's file reference 3128-2-3pct	**IMPORTANT NOTICE**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2014/013028	24 January 2014 (24.01.2014)	24 January 2013 (24.01.2013)

Applicant
PUREPREDICTIVE, INC.

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. +41 22 338 82 70

Authorized officer
Nora Lindner

e-mail: pt05.pct@wipo.int

Form PCT/IB/326 (January 2004)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 3128-2-3pct	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2014/013028	International filing date *(day/month/year)* 24 January 2014 (24.01.2014)	Priority date *(day/month/year)* 24 January 2013 (24.01.2013)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant PUREPREDICTIVE, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 11 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 28 July 2015 (28.07.2015)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Nora Lindner e-mail: pt05.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
8 EAST BROADWAY
SUITE 600
SALT LAKE CITY, UT 84111

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	15 MAY 2014
Applicant's or agent's file reference 3128-2-3PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2014/013028	24 January 2014	24 January 2013

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G09B 7/00 (2014.01)
USPC - 434/350

Applicant PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	02 May 2014	Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2014/013028

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2014/013028

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-27	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-27	NO
Industrial applicability (IA)	Claims	1-27	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 3-7, 12-16, 19-20, 22-27 lack an inventive step under PCT Article 33(3) as being obvious over Connor in view of , and further in view of Meitar et al. (hereinafter, Meitar).

Regarding claim 1, Connor discloses a method, the method comprising:
receiving data collected from interactions of a plurality of students with an electronic learning system ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130; [0013] Step S110, which includes collecting results of a first literacy test of a first group of students, functions to gather information about an initial literacy performance level of a student; [0016] Step S130, which includes collecting results of a second literacy test of a first group of students, functions to determine literacy progress of a student since the first literacy test);
identifying a plurality of archetypal learning patterns in the received data using machine learning ([0012] identifying learning patterns based on the student profile data and teaching plan data S140, and implementing a recommendation engine; [0017] Step S140, which includes identifying learning patterns based on the student profile data and teaching plan data, functions to analyze the teaching plan data and student profile and identify patterns in the educational process. The learning patterns are preferably relationships between an initial literacy performance, final literacy performance, characteristics of the educational method, and additionally other data stored within the student profile); and
associating each student with at least one of the identified archetypal learning patterns using the machine learning ([0012] The implementation of the recommendation engine includes: matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern S160, and recommending a teaching plan for a student of the second group of students S170. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans; [0020] Step S160, which includes matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern, functions to determine a teaching plan pattern that generally produces an increase in literacy performance over a stage of education), but does not explicitly disclose a method for determining student engagement.
In the field of electronic learning ([0001]), Meitar teaches a method for determining student engagement ([0126] The student stations 301-303 are used by students to perform personal learning activities, to conduct personal assignments, to participate in learning activities in-class, to participate in assessment activities, to collaborate in group assignments, to participate in discussions, to perform exercises, to participate in a learning community, to communicate with the teacher station 310 or with other student stations 301-303, to receive or perform personalized learning activities, or the like; [0135] teaching, learning and/or assessment activities are monitored, recorded and stored; [0137] the generated reports are used as alternative or additional assessment of students performance, students' knowledge, students classroom behavior [engagement], e.g., a student is responsive to instructions, a student is non-responsive to instructions, or other student parameters). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide methods of adaptive teaching and learning (Meitar, [0003]).

Regarding claim 3, Connor further teaches the method of claim 1, further comprising sending data for at least one student of the plurality of students based on the at least one archetypal learning pattern associated with the at least one student ([0021] produce recommendations [i.e., data] for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation preferably specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc. Preferably, a software application provides [i.e., sends] the teaching plan recommendation. The various student, group, or class teaching plan recommendations are additionally communicated through the software application. The lesson plan is preferably specific for a class, group and/or student), but is silent on sending an alert for at least one student.
Meitar teaches sending an alert for at least one student ([0133] the teacher station 310 may generate an alert-type message that alerts the teacher to a particular event, e.g., failure or success of a student or a group of students; [0134] For example, system 300 may alert the teacher, using a graphical or textual or audible notification through the teacher station 310, that one or more students or groups of students do not progress at all, or according to pre-defined mile-stones in the learning activity or learning object assigned to them). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to substantially continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2014/013028

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
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Regarding claim 4, Connor further teaches the method of claim 1, wherein the plurality of archetypal learning patterns are based at least partially on known learning outcomes for a set of students ([0013] The first literacy test is administered at the beginning of a new school year, but may alternatively be administered at any suitable time such as when starting a new literacy curriculum, when a new student arrives, or at agreed upon date. The result of the literacy test is stored in a student profile. The student profile additionally or alternatively includes additional test results, and/or any suitable data on educational variables – it is interpreted that the first literacy test result and the additional test results are representative of known learning outcomes; [0017] The learning patterns are relationships between an initial literacy performance, final literacy performance, characteristics of the educational method, and additionally other data stored within the student profile).

Regarding claim 5, Connor further teaches the method of claim 1, but is silent on wherein the received data comprises monitored mouse movement of the plurality of students using the electronic learning system.
Meitar teaches wherein received data comprises monitored mouse movement of a plurality of students using the electronic learning system ([0132] System 300 monitors, logs and reports the performance of student based on their operation of student stations 301-303. System 300 may determine and report that Student B did not operate the keyboard or mouse for a particular time period, e.g., two minutes; [0150] the integrated evaluation and assessment module 403 may determine that the user of a particular student station did not operate its student station, e.g., did not move the mouse, did not click the mouse, for at least a pre-defined time period, e.g., two minutes). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

Regarding claim 6, Connor further teaches the method of claim 1, but is silent on wherein the received data comprises an amount of time the plurality of students remain on areas of a presented page of the electronic learning system.
Meitar teaches wherein received data comprises an amount of time a plurality of students remain on areas of a presented page of the electronic learning system ([0132] System 300 monitors, logs and reports the performance of student based on their operation of student stations 301-303. System 300 may determine and report that Student A appears to be "stuck" or lingering on a particular exercise or learning object; [0134] the teacher may use the teacher station 310 to view a report detailing progress status of students, e.g., whether the student is "stuck" for more than sixty seconds in front of the third question or the fourth screen of a learning object). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

Regarding claim 7, Connor further teaches the method of claim 1, but is silent on wherein the received data comprises text selected by the plurality of students from material of the electronic learning system.
Meitar teaches wherein received data comprises text selected by a plurality of students from material of an electronic learning system ([0106] A learning object includes a stand-alone application, applet, program, or assignment addressed to a student. For example, learning object 211 is an Active-X interactive animated story, in which a student is required to select graphical items using a pointing device, learning object 213 is a Flash application in which the student is required to move textual objects, learning object 215 is a JavaScript program in which the student selects answers in a multiple-choice quiz. Learning objects may include various other content items, for example, interactive text or "live text", writing tools, textual content, or the like). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide various ways to determine the skill level of a student.

Regarding claim 12, Connor further teaches the method of claim 1, but is silent on wherein the received data is collected using executable code embedded in pages sent to the plurality of students by the electronic learning system.
Meitar teaches wherein received data is collected using executable code embedded in pages sent to a plurality of students by an electronic learning system ([0104] system 100 may be implemented using a web 108, such that one or substantially all functions of teaching/learning are available through a web, optionally utilizing web services or web components e.g., web browsers, plug-ins, web applets, or the like – it is known in the art that plug-ins are embedded inside a webpage). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to affect only the page in which the code is embedded.

Regarding claim 13, Connor discloses an apparatus for determining student engagement, the apparatus comprising:
an activity monitor module configured to receive monitored electronic learning interactions of one or more students ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130; [0013] Step S110, which includes collecting results of a first literacy test of a first group of students, functions to gather information about an initial literacy performance level of a student; [0016] Step S130, which includes collecting results of a second literacy test of a first group of students, functions to determine literacy progress of a student since the first literacy test);
a machine learning module configured to compare, using machine learning, the monitored electronic learning interactions to a plurality of archetypal learning patterns ([0012] identifying learning patterns based on the student profile data and teaching plan data and implementing a recommendation engine. The implementation of the recommendation engine includes: matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern S160. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans; [0020] Step S160, which includes matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern, functions to determine a teaching plan pattern that generally produces an increase in literacy performance over a stage of education); and
a result module based on the machine learning comparison ([0012] recommending a teaching plan for a student of the second group of students S170; [0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student. [0021]Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on wherein the result module is configured to send an alert for at least one student of the one or more students.

Supplemental Box

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Meitar teaches a module configured to send an alert for at least one student of the one or more students ([0133] the teacher station 310 may generate an alert-type message that alerts the teacher to a particular event, e.g., failure or success of a student or a group of students; [0134] For example, system 300 may alert the teacher, using a graphical or textual or audible notification through the teacher station 310, that one or more students or groups of students do not progress at all, or according to pre-defined mile-stones in the learning activity or learning object assigned to them). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to substantially continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

Regarding claim 14, Connor further teaches the apparatus of claim 13, wherein the result module is configured to recommend a learning action to take with regard to the at least one student, the machine learning module configured to determine the recommended learning action using machine learning ([0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student; [0021] Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on to send the alert to an authority associated with the at least one student.
Meitar teaches to send an alert to an authority associated with at least one student ([0134] reports or alerts may be generated by system 300 substantially in real-time, during the lesson process in class. For example, system 300 may alert the teacher [i.e., authority], using a graphical or textual or audible notification through the teacher station 310, that one or more students or groups of students do not progress at all, or according to pre-defined mile-stones in the learning activity or learning object assigned to them). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to further retrieve details of the actual progress, for example, by obtaining detailed information on the progress of the relevant student(s) (Meitar, [0134]).

Regarding claim 15, Connor further teaches the apparatus of claim 13, wherein the result module is configured to recommend a learning action for the student to take, the machine learning module configured to determine the recommended learning action using machine learning ([0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student; [0021] Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on to send the alert to the at least one student.
Meitar teaches to send an alert to at least one student ([0151] an alert message may be transferred to the teacher station. Optionally, additional notification may be presented to the student on the relevant student station, e.g., alerting the attention of the student to the determined triggering event. Optionally, additional help or support information, e.g., educational content, explanations, narrations, or the like, may be presented to the student on the relevant student station, either automatically or in response to a pre-approval of the teacher using the teacher station). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to enable students to obtain assistance or help.

Regarding claim 16, Connor further teaches the apparatus of claim 15, but is silent on wherein the alert comprises a real-time notification presented to the at least one student during the electronic learning interactions of the at least one student.
Meitar teaches wherein an alert comprises real-time notification presented to at least one student during electronic learning interactions of the at least one student ([0031] the assessment module is to generate an alert substantially in real-time; [0151] an alert message may be transferred to the teacher station. Optionally, additional notification may be presented to the student on the relevant student station, e.g., alerting the attention of the student to the determined triggering event. Optionally, additional help or support information, e.g., educational content, explanations, narrations, or the like, may be presented to the student on the relevant student station, either automatically or in response to a pre-approval of the teacher using the teacher station). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to enable students to obtain assistance or help.

Regarding claim 19, Connor further teaches the apparatus of claim 13, but is silent on wherein the monitored electronic learning interactions comprise one or more of monitored mouse movement of the one or more students, an amount of time the one or more students remain on a presented electronic learning page, and text selected by the one or more students from electronic learning material.
Meitar teaches wherein monitored electronic learning interactions comprise one or more of monitored mouse movement of the one or more students, an amount of time the one or more students remain on a presented electronic learning page, and text selected by the one or more students from electronic learning material ([0132] System 300 monitors, logs and reports the performance of student based on their operation of student stations 301-303. System 300 may determine and report that Student B did not operate the keyboard or mouse for a particular time period, e.g., two minutes; [0150] the integrated evaluation and assessment module 403 may determine that the user of a particular student station did not operate its student station, e.g., did not move the mouse, did not click the mouse, for at least a pre-defined time period, e.g., two minutes). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2014/013028

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding claim 20, Connor further teaches the apparatus of claim 13, but is silent on wherein the activity module is configured to receive the monitored electronic learning interactions from one or more of a browser extension installed in internet browsers for each of the one or more students, a proxy server disposed between the one or more students and an electronic learning system providing the electronic learning interactions, and executable code embedded in pages with which one or more students are interacting.
Meitar teaches wherein an activity module is configured to receive monitored electronic learning interactions from one or more of a browser extension installed in internet browsers for each of the one or more students, a proxy server disposed between one or more students and an electronic learning system providing the electronic learning interactions, and executable code embedded in pages with which one or more students are interacting ([0104] system 100 may be implemented using a web 108, such that one or substantially all functions of teaching/learning are available through a web, optionally utilizing web services or web components e.g., web browsers, plug-ins, web applets, or the like – it is known in the art that plug-ins are embedded inside a webpage). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to affect only the page in which the code is embedded.

Regarding claim 22, Connor discloses a computer program product comprising a computer readable storage medium storing computer usable program code executable to perform operations ([0015] a software application is preferably a web application, but may be any suitable computer or device program; [0021] a software application provides the teaching plan recommendation), the operations comprising:
receiving data associated with interaction of a plurality of students with electronic learning material ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130; [0013] Step S110, which includes collecting results of a first literacy test of a first group of students, functions to gather information about an initial literacy performance level of a student; [0016] Step S130, which includes collecting results of a second literacy test of a first group of students, functions to determine literacy progress of a student since the first literacy test); and
comparing, using machine learning, the data associated with the interaction with a plurality of archetypal learning patterns ([0012] identifying learning patterns based on the student profile data and teaching plan data and implementing a recommendation engine. The implementation of the recommendation engine includes: matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern S160, and recommending a teaching plan for a student of the second group of students S170. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans; [0020] Step S160, which includes matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern, functions to determine a teaching plan pattern that generally produces an increase in literacy performance over a stage of education); but is silent on determining student engagement; and evaluating the electronic learning material based on the machine learning comparison.
Meitar teaches a method for determining student engagement ([0126] The student stations 301-303 are used by students to perform personal learning activities, to conduct personal assignments, to participate in learning activities in-class, to participate in assessment activities, to collaborate in group assignments, to participate in discussions, to perform exercises, to participate in a learning community, to communicate with the teacher station 310 or with other student stations 301-303, to receive or perform personalized learning activities, or the like; [0135] teaching, learning and/or assessment activities are monitored, recorded and stored; [0137] the generated reports are used as alternative or additional assessment of students performance, students' knowledge, students classroom behavior [engagement], e.g., a student is responsive to instructions, a student is non-responsive to instructions, or other student parameters); and
evaluating an electronic learning material based on a machine learning comparison ([0167] store the teacher's newly-created content and/or the teacher's modified content, e.g., reflecting changes that the teacher introduced to system-provided content, and/or imported educational content. Workstation 500 further includes a content publishing module 534, to allow the teacher to manage a publishing process for created and/or modified and/or imported educational content, e.g., transferring or sending altered or created content from the teacher's personal content repository 533 to other teacher stations, to a shared or general repository accessible by other teachers, or the like. Optionally, the publishing process includes review [i.e., evaluation] and approval procedures, e.g., by other teachers, and results in the placing of approved educational content in a publicly accessible repository such that other teachers may use it; [0022] automatically modifying the second portion of the digital learning activity based on performance by the student of the first portion of the digital learning activity; [0034] the lesson planning module is to modify the lesson plan). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide methods of adaptive teaching and learning (Meitar, [0003]).

Regarding claim 23, Connor further teaches the computer program product of claim 22, but is silent on the operations further comprising recommending based on the machine learning comparison ([0012] identifying learning patterns based on the student profile data and teaching plan data S140, and implementing a recommendation engine. The implementation of the recommendation engine includes: collecting results of a third literacy test of a second group of students S150, matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern S160, and recommending a teaching plan for a student of the second group of students S170. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans), but is silent on a modification to the electronic learning material.
Meitar teaches modification to the electronic learning material ([0022] automatically modifying the second portion of the digital learning activity based on performance by the student of the first portion of the digital learning activity; [0034] the lesson planning module is to modify the lesson plan; [0147] The educational content 401 includes learning materials created by modifying prior or other learning materials). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide replacement of a first learning activity in the lesson plan with a second, different, learning activity (Meitar, [0042]).

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Supplemental Box

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Continuation of:

Regarding claim 24, Connor discloses a system, the system comprising:
a module comprising, an activity monitor module configured to monitor electronic learning interactions of the plurality of students with electronic learning material ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130; [0013] Step S110, which includes collecting results of a first literacy test of a first group of students, functions to gather information about an initial literacy performance level of a student; [0016] Step S130, which includes collecting results of a second literacy test of a first group of students, functions to determine literacy progress of a student since the first literacy test); and
a machine learning module configured to associate a student with a determined learning archetype, using machine learning, based on the monitored electronic learning interactions and on publisher data from the one or more electronic learning publishers ([0012] identifying learning patterns based on the student profile data and teaching plan data [i.e., publisher data], and implementing a recommendation engine. The implementation of the recommendation engine includes: matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern S160, and recommending a teaching plan for a student of the second group of students S170. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans; [0020] Step S160, which includes matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern, functions to determine a teaching plan pattern that generally produces an increase in literacy performance over a stage of education), but does not explicitly disclose a system for determining student engagement; a student engagement module configured to be in communication with a plurality of students, one or more electronic learning publishers one or more learning institutions.
Meitar teaches a system for determining student engagement ([0126] The student stations 301-303 are used by students to perform personal learning activities, to conduct personal assignments, to participate in learning activities in-class, to participate in assessment activities, to collaborate in group assignments, to participate in discussions, to perform exercises, to participate in a learning community, to communicate with the teacher station 310 or with other student stations 301-303, to receive or perform personalized learning activities, or the like; [0135] teaching, learning and/or assessment activities are monitored, recorded and stored; [0137] the generated reports are used as alternative or additional assessment of students performance, students' knowledge, students classroom behavior [engagement], e.g., a student is responsive to instructions, a student is non-responsive to instructions, or other student parameters), the system comprising:
a student engagement module (Fig. 3, Collaboration Tools 330) configured to be in communication with a plurality of students (Fig. 3, Student Stations 301, 302, 303), one or more electronic learning publishers (Fig. 3, Content Development Tools 323), and one or more learning institutions (Fig. 3, Teacher Station 310; [0128] Content development tools 323 are used, locally or remotely, to generate original or new education content, or to modify or edit or update content items, for example, utilizing templates, editors, step-by-step "wizard" generators, packaging tools, sequencing tools, "wrapping" tools, authoring tools, or the like; [0140] a system 300 may include collaboration tools 330 to allow real-time in-class collaboration, e.g., allowing students to send or submit their accomplishments or their work results to a common space, from which the teacher utilizing the teacher station 310 selects one or more of the submission items for projection, for comparison, or the like). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide methods of adaptive teaching and learning (Meitar, [0003]).

Regarding claim 25, Connor further teaches the system of claim 24, recommending a learning action to take with regard to one or more of the plurality of students, the machine learning module configured to determine the recommended learning action using machine learning ([0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student; [0021] Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on wherein the student engagement module further comprises a result module configured to send an alert to the one or more learning institutions.
Meitar teaches wherein a student engagement module further comprises a result module configured to send an alert to one or more learning institutions ([0133] the teacher station 310 may generate an alert-type message that alerts the teacher to a particular event, e.g., failure or success of a student or a group of students; [0134] For example, system 300 may alert the teacher, using a graphical or textual or audible notification through the teacher station 310, that one or more students or groups of students do not progress at all, or according to pre-defined mile-stones in the learning activity or learning object assigned to them – it is interpreted that a teacher is part of the staff of a learning institution). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to substantially continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

Regarding claim 26, Connor further teaches the system of claim 24, recommending a learning action for the one or more students to take, the machine learning module configured to determine the recommended learning action using machine learning ([0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student; [0021] Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on wherein the student engagement module further comprises a result module configured to send an alert to one or more of the plurality of students.
Meitar teaches wherein the student engagement module further comprises a result module configured to send an alert to one or more of the plurality of students ([0151] an alert message may be transferred to the teacher station. Optionally, additional notification may be presented to the student on the relevant student station, e.g., alerting the attention of the student to the determined triggering event. Optionally, additional help or support information, e.g., educational content, explanations, narrations, or the like, may be presented to the student on the relevant student station, either automatically or in response to a pre-approval of the teacher using the teacher station). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to enable students to obtain assistance or help.

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Supplemental Box

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Continuation of:

Regarding claim 27, Connor further teaches the system of claim 24, but is silent on wherein the student engagement module further comprises a result module configured to send an evaluation of the electronic learning material to the one or more electronic learning publishers, the machine learning module configured to determine the evaluation using machine learning.
Meitar teaches a result module configured to send an evaluation of the electronic learning material to the one or more electronic learning publishers, the machine learning module configured to determine the evaluation using machine learning ([0167] store the teacher's newly-created content and/or the teacher's modified content, e.g., reflecting changes that the teacher introduced to system-provided content, and/or imported educational content. Workstation 500 further includes a content publishing module 534, to allow the teacher to manage a publishing process for created and/or modified and/or imported educational content, e.g., transferring or sending altered or created content from the teacher's personal content repository 533 to other teacher stations, to a shared or general repository accessible by other teachers, or the like. Optionally, the publishing process includes review [i.e., evaluation] and approval procedures, e.g., by other teachers, and results in the placing of approved educational content in a publicly accessible repository such that other teachers may use it; [0022] automatically modifying the second portion of the digital learning activity based on performance by the student of the first portion of the digital learning activity; [0034] the lesson planning module is to modify the lesson plan). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide methods of adaptive teaching and learning (Meitar, [0003]).

Claim 2 lacks an inventive step under PCT Article 33(3) as being obvious over Connor in view of Meitar, and further in view of Yaski.

Regarding claim 2, Connor further teaches the method of claim 1, and associating each student with the at least one of the identified archetypal learning patterns ([0012] matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern S160; [0020] Step S160 includes matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern), but is silent on further comprising modeling each student as a time series path through one or more lessons of the electronic learning system, and correlating the time series path for a particular student with the associated at least one of the identified archetypal learning patterns.
In assessing engagement levels between students and providers (Title), Yaski teaches modeling each student as a time series path through one or more lessons of an electronic learning system, and correlating the time series path for a particular student ([0086] The data analytics and benchmarking 208 provides a cross-academic institution analysis and reporting capability that compares and contrasts the behavior [i.e., pattern] of students at different academic institutions that have implemented the Starfish system 100 [i.e., electronic learning system] and looks at trends over time). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Yaski in order to measuring effectiveness (Yaski, Abstract).

Claims 8-9, 17-18 and 21 lack an inventive step under PCT Article 33(3) as being obvious over Connor in view of Meitar, and further in view of Hochwarth et al. (hereinafter, Hochwarth).

Regarding claim 8, Connor further teaches the method of claim 1, and a plurality of archetypal learning patterns ([0012] obtaining learning patterns from a teaching plan database), but does not disclose one or more macro archetypal learning patterns associated with a student's overall success relative to the electronic learning system; one or more course archetypal learning patterns associated with a single instructional course of the electronic learning system; and one or more micro archetypal learning patterns associated with a particular lesson of the electronic learning system.
Meitar teaches one or more course archetypal learning patterns associated with a single instructional course of an electronic learning system ([0263] The script may modify the path of learning, e.g., the sequence or the educational content elements that are presented or activated, according to a students' behavior or interaction with the educational content [i.e., course]. For example, built-in algorithms may assess or evaluate ["judge"] the students' interaction with the educational content. The assessment or evaluation ["judgment"] of students' interactions by the system is based on predicted patterns of behavior). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to allow production of differential learning processes for different groups or students (Meitar, [0262]).
In presenting a training course to a learner (Abstract), Hochwarth teaches one or more macro archetypal learning patterns and one or more micro archetypal learning patterns ([0028] Learner 104 may access and work through web based courses using the learning interface; [0060] Learning strategies may be created using macro-strategies and micro-strategies; [0034] dynamically adjust the number and sequence of learning objects to the learner's individual learning pattern; [0061] Macro-strategies are used in learning strategies to refer to the coarse-grained structure of a course; [0063] Micro-strategies, implemented by the learning strategies, target the learning progression within a learning unit). Further, wherein the macro/micro learning patterns are associated with specific data would have been a matter of design choice and a practice known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to allow a learner to select from a number of different learning strategies when taking a course.

Regarding claim 9, Connor further teaches the method of claim 1, but is silent on wherein the machine learning comprises a machine learning ensemble comprising a plurality of learned functions from multiple classes, the plurality of learned functions selected from a larger plurality of generated learned functions.
Hochwarth teaches wherein machine learning comprises a machine learning ensemble comprising a plurality of learned functions from multiple classes, the plurality of learned functions selected from a larger plurality of generated learned functions ([0043] Learning units 303 may be assembled using one or more knowledge items 304 to represent a distinct thematically-coherent unit; [0044] Sub-courses 302 may be assembled using other sub-courses 302, learning units 303, and/or knowledge items 304. The sub-course 302 may be used to split up an extensive course into several smaller subordinate courses; [0045] Courses 301 may be assembled from all of the subordinate structural elements including sub-courses 302, learning units 303, and knowledge items 304). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to provide different modules to perform different function within the system.

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Supplemental Box

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Continuation of:

Regarding claim 17, Connor further teaches the apparatus of claim 13, but is silent on further comprising an ensemble factory module configured to form the machine learning, the machine learning comprising a machine learning ensemble comprising a plurality of learned functions from multiple classes, the ensemble factory module configured to generate a larger plurality of generated learned functions using training data and to select the plurality of learned functions for the machine learning ensemble based on an evaluation of the larger plurality of learned functions using test data.
Hochwarth teaches an ensemble factory module configured to form the machine learning, the machine learning comprising a machine learning ensemble comprising a plurality of learned functions from multiple classes, the ensemble factory module configured to generate a larger plurality of generated learned functions ([0024] "software" may be written or described in any appropriate computer language including C, C++, Java, J#, Visual Basic, assembler; [0028] Learner 104 may access and work through web based courses using the learning interface; [0060] Learning strategies may be created using macro-strategies and micro-strategies; [0034] dynamically adjust the number and sequence of learning objects to the learner's individual learning pattern; [0061] Macro-strategies are used in learning strategies to refer to the coarse-grained structure of a course; [0063] Micro-strategies, implemented by the learning strategies, target the learning progression within a learning unit). Furthermore, using specific data, such as training data, to perform the functions would have been a matter of design choice, which would have been known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to allow a learner to select from a number of different learning strategies when taking a course.

Regarding claim 18, Connor further teaches the apparatus of claim 13, but is silent on wherein the machine learning comprises a plurality of machine learning ensembles, different machine learning ensembles associated with different archetypal learning patterns.
Hochwarth teaches a plurality of machine learning ensembles, and different machine learning ensembles ([0024] "software" may be written or described in any appropriate computer language including C, C++, Java, J#, Visual Basic, assembler; [0028] Learner 104 may access and work through web based courses using the learning interface; [0060] Learning strategies may be created using macro-strategies and micro-strategies; [0034] dynamically adjust the number and sequence of learning objects to the learner's individual learning pattern; [0061] Macro-strategies are used in learning strategies to refer to the coarse-grained structure of a course; [0063] Micro-strategies, implemented by the learning strategies, target the learning progression within a learning unit). Further, wherein the ensembles are associated with different learning patterns would have been a matter of design choice and a practice known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to allow a learner to select from a number of different learning strategies when taking a course.

Regarding claim 21, Connor further teaches the apparatus of claim 13, and a plurality of archetypal learning patterns ([0012] obtaining learning patterns from a teaching plan database), but is silent on wherein the plurality of archetypal learning patterns comprise one or more of a macro archetypal learning pattern associated with an overall result of a student's electronic learning interactions, a course archetypal learning pattern associated with a single electronic course, and a micro archetypal learning pattern associated with a particular electronic lesson.
Meitar teaches a course archetypal learning pattern associated with a single electronic course ([0263] The script may modify the path of learning, e.g., the sequence or the educational content elements that are presented or activated, according to a students' behavior or interaction with the educational content [i.e., course]. For example, built-in algorithms may assess or evaluate ["judge"] the students' interaction with the educational content. The assessment or evaluation ["judgment"] of students' interactions by the system is based on predicted patterns of behavior). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to allow production of differential learning processes for different groups or students (Meitar, [0262]).
Hochwarth teaches one or more of a macro archetypal learning pattern, and a micro archetypal learning pattern ([0024] "software" may be written or described in any appropriate computer language including C, C++, Java, J#, Visual Basic, assembler; [0028] Learner 104 may access and work through web based courses using the learning interface; [0060] Learning strategies may be created using macro-strategies and micro-strategies; [0034] dynamically adjust the number and sequence of learning objects to the learner's individual learning pattern; [0061] Macro-strategies are used in learning strategies to refer to the coarse-grained structure of a course; [0063] Micro-strategies, implemented by the learning strategies, target the learning progression within a learning unit). Further, wherein the macro/micro learning patterns are associated with specific data would have been a matter of design choice and a practice known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to allow a learner to select from a number of different learning strategies when taking a course.

Claim 10 lacks an inventive step under PCT Article 33(3) as being obvious over Connor in view of Meitar, and further in view of Landwehr.

Regarding claim 10, Connor further teaches the method of claim 1, but is silent on wherein the received data is collected using a browser extension installed in internet browsers for each of the plurality of students.
In timely learning of vocabulary and word units (Abstract), Landwehr teaches wherein received data is collected using a browser extension installed in internet browsers for each of a plurality of students ([0066] the learning system 100 is read in a web browser online the text of a foreign language news portal, for example via a link of this medium in the media database, the user of the learning system 100 transferred, or parallel to the reading of the message body with a built in browser add-on application of the learning system 100 to select a term in the message body). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Landwehr in order to make sure that the program is installed in the web browser itself, not really the webpage.

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Supplemental Box

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Claim 11 lacks an inventive step under PCT Article 33(3) as being obvious over Connor in view of Meitar, and further in view of Atkinson et al. (hereinafter, Atkinson).

Regarding claim 11, Connor further teaches the method of claim 1, wherein received data is collected ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130), but is silent on using a proxy server disposed between the plurality of students and the electronic learning system.
In disclosing a computer implemented education system (Title), Atkinson teaches using a proxy server disposed between a plurality of students and an electronic learning system (Col. 3 lns. 59-63, The client computers 101-106 can directly or indirectly communicate with the host system 150 to obtain data stored at the host 150. Indirect communication can include communication through a proxy server).
Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Atkinson in order to use the proxy server as a gateway.

Claims 1-27 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING TRANSMITTAL OF COPY OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (CHAPTER I OF THE PATENT COOPERATION TREATY)
(PCT Rule 44bis.1(c))

To:

HILTON, Scott, C.
8 East Broadway
Suite 600
Salt Lake City, Utah 84111
ETATS-UNIS D'AMERIQUE

Date of mailing *(day/month/year)*
23 July 2015 (23.07.2015)

Applicant's or agent's file reference
3128-2-4pct

IMPORTANT NOTICE

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2014/010729	08 January 2014 (08.01.2014)	08 January 2013 (08.01.2013)

Applicant
PUREPREDICTIVE, INC.

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty).

The International Bureau of WIPO
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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 3128-2-4pct	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2014/010729	International filing date *(day/month/year)* 08 January 2014 (08.01.2014)	Priority date *(day/month/year)* 08 January 2013 (08.01.2013)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant PUREPREDICTIVE, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 14 July 2015 (14.07.2015)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Nora Lindner e-mail: pt05.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	28 AUG 2014
Applicant's or agent's file reference 3128-2-4PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 14/10729	08 January 2014 (08.01.2014)	08 January 2013 (08.01.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/18 (2014.01)
USPC - 706/12

Applicant PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Fom PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	28 July 2014 (28.07.2014)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/10729

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/10729

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-20	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-20 lack an inventive step under PCT Article 33(3) as being obvious over US 7,689,520 B2 to Burges et al. (hereinafter Burgess) in view of US 2010/0306141 A1 to Chidlovskii.

Regarding claim 1, Burgess teaches an apparatus for machine learning in a data management product (a machine learning system that can be used to rank data with sets, col. 1, ln 53-58), the apparatus comprising: an input module configured to receive an analysis request for a data management product (Fig. 1, input data store 120 contains data to be input to and ranked by the ranking component 110, col. 3, ln 55-61); a learned function module (Fig. 1, ranking component 100 can be any machine learning system that can be trained using gradient descent, col. 3, ln 37-54); and a result module configured to provide native access, within the data management product, to the one or more unknown values (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components, col. 3, ln 62 to col. 4, ln 3). Burges does not expressly teach configured to execute one or more machine learning ensembles to predict one or more unknown values for the data management product. However Chidlovskii, in an analogous art, teaches configured to execute one or more machine learning ensembles (learning algorithm is trained with the training set and the concept evolution model , para [0021]) to predict one or more unknown values for the data management product (train a learning method for predicting class labels for unlabeled elements, para [0018]). It would have been obvious to one skilled in the art to combine the teachings of Burgess with those of Chidlovskii in order to more efficiently classify data items in the data ranking machine learning system of Burges (see Chidlovskii para [0005]-[0006]).

Regarding claim 2, Burges further teaches wherein one or more of the input module, the learned function module, and the result module are integrated with the data management product as one or more of an add-on, a plug-in, and an extension (a component can be a process running on a processor, a processor, an object, an executable, a program, and/or a computer. Also, both an application running on a server and the server can be components, col. 3, ln 7-17).

Regarding claim 3, Chidlovskii further teaches wherein the result module is further configured to provide native access, within the data management product, to a confidence value corresponding to each of the one or more unknown values (computing a confidence factor that the initial training set of predicted classes defined by element instance features within the data item, para [0037]).

Regarding claim 4, Burgess further teaches an ensemble factory module configured to generate the one or more machine learning ensembles using training data from the data management product (Fig. 4, an exemplary training set 400 is depicted. The training set 400 is subdivided into training examples 410 that are grouped into training pairs 420, col. 13, ln 29-45). Chidlovskii further teaches the one or more machine learning ensembles configured to predict the one or more unknown values in the data management product using workload data from the data management product (classified is initially annotated in accordance with a training set of predicted classes to be associated with element instances within the data item 10, para [0037]).

Regarding claim 5, Burgess further teaches wherein the result module provides native access through one or more of a native query language and a native interface of the data management product (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components or presented to a user, or both. An example of such ranked data is the result of a search for documents on a network, such as web pages on the Internet, that are responsive to a user's query. A set of responsive documents may be presented as input data and ranked in an order based upon certain criteria before being presented to the user as ranked search results, col. 3, ln 62 to col. 4, ln 3).

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/10729

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 6, Burgess teaches a method for machine learning in a data management product (a machine learning system that can be used to rank data with sets, col. 1, ln 53-58), the method comprising: receiving an analysis request for a data management product (Fig. 1, input data store 120 contains data to be input to and ranked by the ranking component 110, col. 3, ln 55-61); and providing native access, within the data management product, to one or more predicted values corresponding to the one or more unknown values (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components, col. 3, ln 62 to col. 4, ln 3). Burgess does not expressly teach executing one or more machine learning ensembles to predict one or more unknown values for the data management product. However Chidlovskii, in an analogous art, teaches executing one or more machine learning ensembles (learning algorithm is trained with the training set and the concept evolution model , para [0021]) to predict one or more unknown values for the data management product (train a learning method for predicting class labels for unlabeled elements, para [0018]). It would have been obvious to one skilled in the art to combine the teachings of Burgess with those of Chidlovskii in order to more efficiently classify data items in the data ranking machine learning system of Burges (see Chidlovskii para [0005]-[0006]).

Regarding claim 7, Chidlovskii further teaches providing native access, within the data management product, to a confidence value corresponding to each of the one or more unknown values (computing a confidence factor that the initial training set of predicted classes defined by element instance features within the data item, para [0037]).

Regarding claim 8, Burges further teaches modifying a data structure of the data management product (program modules include routines, programs, components, data structures, col. 16, ln 24-39). Chidlovskii further teaches to store the one or more predicted values (annotated in accordance with a training set of predicted classes to be associated with element instances within the data item 10, para [0037]).

Regarding claim 9, Burges further teaches wherein providing native access includes providing access through one or more of a native query language and a native interface of the data management product (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components or presented to a user, or both. An example of such ranked data is the result of a search for documents on a network, such as web pages on the Internet, that are responsive to a user's query. A set of responsive documents may be presented as input data and ranked in an order based upon certain criteria before being presented to the user as ranked search results, col. 3, ln 62 to col. 4, ln 3).

Regarding claim 10, Burges further teaches generating the one or more machine learning ensembles using training data from the data management product (Fig. 4, an exemplary training set 400 is depicted. The training set 400 is subdivided into training examples 410 that are grouped into training pairs 420, col. 13, ln 29-45). Chidlovskii further teaches the one or more machine learning ensembles configured to predict the one or more unknown values in the data management product using workload data from the data management product (classified is initially annotated in accordance with a training set of predicted classes to be associated with element instances within the data item 10, para [0037]).

Regarding claim 11, Chidlovskii further teaches receiving, by the machine learning module, a new ensemble request from the data management product (an adoption of a major active learning principle, namely uncertainty based sampling. It is based on measuring the learner confidence on unlabeled instances, para [0032]), wherein generating the one or more machine learning ensembles comprises: receiving the training data, the training data being associated with the new ensemble request (model function is defined as a complex curb (or non-linear SVM kernels), and an active learning principle is used to estimate the parameters for the optimal separation curb. In FIG. 3, question marks point to the most uncertain elements according to the last model trained with the available training set, para [0049]); generating a plurality of learned functions using the training data; evaluating the plurality of learned function using test data from the training data; and forming a machine learning ensemble comprising two or more learned functions based on the evaluation of the plurality of learned functions (Core features f.sub.1 to f.sub.3 are reported for all instances and are used to train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x). Observation x.sub.7 is the most uncertain and therefore is the top candidate for new labeling, para [0049]).

Regarding claim 12, Chidlovskii further teaches wherein the plurality of learned functions are generated from multiple classes using the training data and the machine learning ensemble is formed by combining a subset of the plurality of learned functions from at least two classes of the multiple classes (shows four instances x.sub.1 to x.sub.4 annotated with classes y.sub.1 and y.sub.2 (marked with) and at least three unlabeled instances x.sub.5 to x.sub.7. Core features f.sub.1 to f.sub.3 are reported for all instances and are used to train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x). Observation x.sub.7 is the most uncertain and therefore is the top candidate for new labeling, para [0049]).

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WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No. PCT/US 14/10729

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**

Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 13, Chidlovskii further teaches wherein generating the one or more machine learning ensembles comprises: generating a plurality of learned functions (an adoption of a major active learning principle, namely uncertainty based sampling. It is based on measuring the learner confidence on unlabeled instances, para [0032]); evaluating the plurality of learned function (model function is defined as a complex curb (or non-linear SVM kernels), and an active learning principle is used to estimate the parameters for the optimal separation curb, para [0049]); combining the plurality of learned functions in a plurality of learned function combinations (shows four instances x.sub.1 to x.sub.4 annotated with classes y.sub.1 and y.sub.2 (marked with) and at least three unlabeled instances x.sub.5 to x.sub.7. Core features f.sub.1 to f.sub.3 are reported for all instances and are used to train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x). Observation x.sub.7 is the most uncertain and therefore is the top candidate for new labeling, para [0049]); evaluating the pluraility of learned function combinations (train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x), para [0049]). Burges further teaches extending the plurality of learned function combinations with one or more layers, at least one of the layers comprising a probabilistic model (Ranks can be modeled probabilistically: that is, for each pair i, j, the model will learn an approximation to the probability that r.sub.i>r.sub.j. A probabilistic model may be more desirable for this problem than in the case of pattern recognition or regression estimation because during labeling, col. 6, ln 1-28); evaluating the extended combined learned functions using test data; selecting a subset of the extended combined learned functions (map R can be many to one in the sense that multiple samples can have the same rank, but every training sample is assigned a rank. In a more flexible manner, pairs of training examples can be presented to the system, where the first element of the pair is desired to be ranked above the second, col. 6, ln 1-28); synthesizing the selected subset of the extended combined learned functions with metadata generated by the evaluations (both the original image and metadata associated with the image can be used to generate features, col. 13, ln 46-65).

Regarding claim 14, Chidlovskii further teaches wherein the one or more machine learning ensembles are generated automatically in response to one or more of a command and a query from a user of the data management product without further interaction with the user (A confidence factor is computed that the applied annotation is accurate. When an element instance is identified such that a corresponding applied annotation has a low confidence factor, the applied annotation is adjusted by changing the classifying defining features of the selected item. A second annotating model is then composed for more accurate classifying of the data item, para [0021]).

Regarding claim 15, Chidlovskii further teaches regenerating the one or more machine learning ensembles in response to a trigger event (When an element instance is identified such that a corresponding applied annotation has a low confidence factor, the applied annotation is adjusted by changing the classifying defining features of the selected item. A second annotating model is then composed for more accurate classifying of the data item, para [0021]).

Regarding claim 16, Burges further teaches wherein the trigger event includes one or more of a change in data stored in the data management product, a manual update request, and a passing of a predetermined amount of time (a method for allowing the neural network to choose any mapping that is as consistent as possible with the set of ranked pairs used for training. Whereas in usual neural network training, the cost function is a function of the network output of a single pattern, here it is taken to be a function of the difference of the network outputs of a pair of patterns, col. 6, ln 28-53).

Regarding claim 17, Chidlovskii further teaches wherein the data management product comprises a spreadsheet product (data collection or an element instance within a document. Any element instance in the document is associated with a set of features indicative of accurate identification of the element instance, para [0018]).

Regarding claim 18, Burges further teaches wherein the data management product comprises a database product that operates using a structured query language (SQL) (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components or presented to a user, or both. An example of such ranked data is the result of a search for documents on a network, such as web pages on the Internet, that are responsive to a user's query. A set of responsive documents may be presented as input data and ranked in an order based upon certain criteria before being presented to the user as ranked search results, col. 3, ln 62 to col. 4, ln 3).

Regarding claim 19, Burges teaches a method for machine learning in a data management product (a machine learning system that can be used to rank data with sets, col. 1, ln 53-58), the method comprising: providing a machine learning module in communication with a data management product (Fig. 1, input data store 120 contains data to be input to and ranked by the ranking component 110, col. 3, ln 55 -61); receiving training data from the data management product (Fig. 1, ranking component 100 can be any machine learning system that can be trained using gradient descent, col. 3, ln 37-54); generating a plurality of learned functions using the training data (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components, col. 3, ln 62 to col. 4, ln 3). Burgess does not expressly teach transmitting a new ensemble request from the data management product to the machine learning module; forming a machine learning ensemble based on the plurality of learned functions; and integrating the machine learning ensemble with the data management product to provide access to machine learning results within the data management product. However Chidlovskii, in an analogous art, teaches transmitting a new ensemble request from the data management product to the machine learning module (learning algorithm is trained with the training set and the concept evolution model , para [0021]); forming a machine learning ensemble based on the plurality of learned functions (train a learning method for predicting class labels for unlabeled elements, para [0018]); and integrating the machine learning ensemble with the data management product to provide access to machine learning results within the data management product (a component can be a process running on a processor, a processor, an object, an executable, a program, and/or a computer. Also, both an application running on a server and the server can be components, col. 3, ln 7-17). It would have been obvious to one skilled in the art to combine the teachings of Burgess with those of Chidlovskii in order to more efficiently classify data items in the data ranking machine learning system of Burges (see Chidlovskii para [0005]-[0006]).

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No. PCT/US 14/10729

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**

Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 20, Chidlovskii further teaches wherein forming a machine learning ensemble based on the plurality of learned functions (an adoption of a major active learning principle, namely uncertainty based sampling. It is based on measuring the learner confidence on unlabeled instances, para [0032]) comprises: evaluating the plurality of learned function (model function is defined as a complex curb (or non-linear SVM kernels), and an active learning principle is used to estimate the parameters for the optimal separation curb, para [0049]); combining the plurality of learned functions m a plurality of learned function combinations (shows four instances x.sub.1 to x.sub.4 annotated with classes y.sub.1 and y.sub.2 (marked with) and at least three unlabeled instances x.sub.5 to x.sub.7. Core features f.sub.1 to f.sub.3 are reported for all instances and are used to train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x). Observation x.sub.7 is the most uncertain and therefore is the top candidate for new labeling, para [0049]); evaluating the plurality of learned function combinations (train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x), para [0049]). Burges further teaches extending the plurality of learned function combinations with one or more layers, at least one of the layers comprising a probabilistic model (Ranks can be modeled probabilistically: that is, for each pair i, j, the model will learn an approximation to the probability that r.sub.i>r.sub.j. A probabilistic model may be more desirable for this problem than in the case of pattern recognition or regression estimation because during labeling, col. 6, ln 1-28); evaluating the extended combined learned functions using test data; selecting a subset of the extended combined learned functions (map R can be many to one in the sense that multiple samples can have the same rank, but every training sample is assigned a rank. In a more flexible manner, pairs of training examples can be presented to the system, where the first element of the pair is desired to be ranked above the second, col. 6, ln 1-28); synthesizing the selected subset of the extended combined learned functions with metadata generated by the evaluations; and organizing the synthesized subset into a machine learning ensemble (both the original image and metadata associated with the image can be used to generate features, col. 13, ln 46-65).

Claims 1-20 have industrial applicability as defined by PCT Article 33(4), because the subject matter can be made or used in industry.

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by either submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 to on August 14, 2015.

/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2129 Examiner: Daywayshwar D. Misir

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

____ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

__X__ under 37 CFR 1 .97(c) together with either a:
__X__ Statement under 37 CFR 1.97(e), or
____ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

____ under 37 CFR 1.97(d) together with a:
_____ Statement under 37 CFR 1.97(e), and
_____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

__X__ under 37 CFR 1.97(e),

__X__ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: August 14, 2015
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Salt Lake City, UT 84101
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Fax (801) 531-1929

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13904963
Filing Date	2013-05-29
First Named Inventor	Kelly D. Phillipps
Art Unit	2129
Examiner Name	Daywayshwar D. Misir
Attorney Docket Number	3128.2.5

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7328218		2008-02-05	Steinberg, et al.	
	2	8229864		2012-07-24	Lin, et al.	
	3	8209271		2012-06-26	Lin, et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20080168011		2008-07-10	Steinberg	
	2	20120191631		2012-07-26	Breckenridge, et al.	
	3	20120158624		2012-06-21	Lingenfelder, et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2012151198	WO		2012-11-08	Google, Inc.		☐

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	1	STEINBERG, DAN, "CART 6.0", Salford Systems, 2006, pgs. 440, www.salford-systems, com	☐
	2	"SPM Features", Salford Systems - Data Mining and Predictive Analytics Software, downloaded April 30, 2015, pgs. 5, https://www.walford-systems, com/products/spm-features	☐
	3	Application No. PCT/US2013/070358, 3128.2.1PCT, International Preliminary Report on Patentability, May 28, 2015	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2129
	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2015-06-30
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING TRANSMITTAL OF COPY OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (CHAPTER I OF THE PATENT COOPERATION TREATY)
(PCT Rule 44bis.1(c))

To:

HILTON, Scott, C.
8 East Broadway
Suite 600
Salt Lake City, Utah 84111
ETATS-UNIS D'AMERIQUE

Date of mailing *(day/month/year)* 28 May 2015 (28.05.2015)	
Applicant's or agent's file reference 3128-2-1PCT	**IMPORTANT NOTICE**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2013/070358	15 November 2013 (15.11.2013)	15 November 2012 (15.11.2012)

Applicant
PUREPREDICTIVE, INC.

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. +41 22 338 82 70

Authorized officer
Mineko Mohri

e-mail: pt08.pct@wipo.int

Form PCT/IB/326 (January 2004)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 3128-2-1PCT	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2013/070358	International filing date *(day/month/year)* 15 November 2013 (15.11.2013)	Priority date *(day/month/year)* 15 November 2012 (15.11.2012)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant PUREPREDICTIVE, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 19 May 2015 (19.05.2015)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Mineko Mohri e-mail: pt08.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
HILTON,SCOTT, C.

8 EAST BROADWAY SUITE 600 SALT LAKE CITY UT
84111 USA

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)*	**28 February 2014 (28.02.2014)**
Applicant's or agent's file reference 3128-2-1PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2013/070358	**15 November 2013 (15.11.2013)**	15 November 2012 (15.11.2012)

International Patent Classification (IPC) or both national classification and IPC

G06F 17/00(2006.01)i

Applicant
PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR	Date of completion of this opinion	Authorized officer
International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea Facsimile No. +82-42-472-7140	27 February 2014 (27.02.2014)	NHO, Ji Myong Telephone No. +82-42-481-8528

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/070358

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of :

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

   ☐ on paper

   ☐ in electronic form

   b. (time)

   ☐ in the international application as filed.

   ☐ together with the international application in electronic form.

   ☐ subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additioanl copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/070358

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-27	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-27	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-27	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:

D1: US 2012-0191631 A1 (JORDAN M. BRECKENRIDGE et al.) 26 July 2012
D2: US 8,209,271 B1 (WEI-HAO LIN et al.) 26 June 2012
D3: US 2012-0158624 A1 (CHRISTOPH LINGENFELDER et al.) 21 June 2012
D4: WO 2012-151198 A1 (GOOGLE INC.) 08 November 2012
D5: US 8,229,864 B1 (WEI-HAO LIN et al.) 24 July 2012

2.1 Novelty and Inventive Step (PCT Article 33(2) and 33(3))

2.1.1 Independent claim 1 and dependent claims 2-14

The subject matter of **claim 1** differs from D1 in that the apparatus of claim 1 comprises a predictive compiler module configured to form a predictive ensemble, the predictive ensemble comprising a subset of multiple learned functions from the plurality of learned functions, the multiple learned functions selected and combined based on evaluation metadata for the plurality of learned functions, the predictive ensemble comprising a rule set synthesized from the evaluation metadata to direct data through the multiple learned functions. In addition, such different features are not disclosed in any one of the other available documents D2-D5, nor are they obvious to a person skilled in the art by documents D1-D5, taken alone or in combination. Therefore, claim 1 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 2-14 are directly or indirectly dependent on claim 1. Therefore, claims 2-14 meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Continued on Supplemental Box

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of : Box No. V

2.1.2 Independent claim 15 and dependent claims 16-17

The subject matter of **claim 15** differs from D1 in that the method of claim 1 comprises pseudo-randomly generating a plurality of learned functions based on training data without prior knowledge regarding suitability of the generated learned functions for the training data, the training data received for forming a predictive ensemble customized for the training data; evaluating the plurality of learned functions using test data to generate evaluation metadata; and forming the predictive ensemble comprising a subset of multiple learned functions from the plurality of learned functions, the subset of multiple learned functions selected and combined based on the evaluation metadata, the predictive ensemble comprising a rule set synthesized from the evaluation metadata to direct workload data through the multiple learned functions. In addition, such different features are not disclosed in any one of the other available documents D2-D5, nor are they obvious to a person skilled in the art by documents D1-D5, taken alone or in combination. Therefore, claim 15 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 16-17 are dependent on claim 15. Therefore, claims 16-17 meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

2.1.3 Independent claim 18 and dependent claims 19-23

The subject matter of **claim 18** differs from D1 in that the operations performed by the program code stored on the storage medium comprised in the computer program product of claim 18 comprises forming a predictive ensemble, the predictive ensemble comprising at least two learned functions from a plurality of learned functions, the at least two learned functions using a selected subset of features, the at least two learned functions selected and combined based on the evaluation metadata, the predictive ensemble comprising a rule set synthesized from the evaluation metadata to direct data through the at least two learned functions. In addition, such different features are not disclosed in any one of the other available documents D2-D5, nor are they obvious to a person skilled in the art by documents D1-D5, taken alone or in combination. Therefore, claim 18 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 19-23 are directly or indirectly dependent on claim 18. Therefore, claims 19-23 meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Continued on The Next Page

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of : Previous Page

2.1.4 Independent claim 24 and dependent claims 25-27

The subject matter of **claim 24** differs from D1 in that the predictive analytics ensemble of claim 24 comprises multiple learned functions synthesized from a larger plurality of learned functions, the multiple learned functions selected and combined based on evaluation metadata for the larger plurality of learned functions; a metadata rule set synthesized from the evaluation metadata for the plurality of learned functions for directing data through the multiple learned functions to produce a result; and an orchestration module configured to direct the data through the multiple learned functions based on the synthesized metadata rule set to produce the result. In addition, such different features are not disclosed in any one of the other available documents D2-D5, nor are they obvious to a person skilled in the art by documents D1-D5, taken alone or in combination. Therefore, claim 24 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 25-27 are directly or indirectly dependent on claim 24. Therefore, claims 25-27 meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

2.2 Industrial Applicability (PCT Article 33(4))

Claims 1-27 are industrially applicable under PCT Article 33(4).

Electronic Acknowledgement Receipt

EFS ID:	22793799
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	01-JUL-2015
Filing Date:	29-MAY-2013
Time Stamp:	01:08:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS12coversheet.pdf	48820 e3240228b576790cca3e4facec22b1a426e3aa73	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS12.pdf	612767 6acc9f089ee0b79e2a6a3ad2b57c70cccc4aca10	no	4
Warnings:					
Information:					
3	Non Patent Literature	3128_2_1pct_IPRP_05_28_15.pdf	1033652 092a92d3ca1cb31a17bb080cfa86972bd871fa31	no	7
Warnings:					
Information:					
4	Non Patent Literature	CART6.pdf	16170432 da9bb83a0a24f55e3ecbd6d9b451cb3ebdc18927	no	440
Warnings:					
Information:					
5	Non Patent Literature	SalfordSystems_DataMiningandPredictiveAnalyticsSoftware.pdf	808634 0721ecd3da371b421e21a46c4807e2a107e13a51	no	5
Warnings:					
Information:					
6	Foreign Reference	WO2012151198A1.pdf	4540370 583df113bc69c9d20dd0f46d2ca02e8dccdb759c	no	69
Warnings:					
Information:					
			Total Files Size (in bytes):	23214675	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by either submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 to on June 3, 2015.

/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2129 Examiner: Daywayshwar D. Misir

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

____ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

__X__ under 37 CFR 1 .97(c) together with either a:
__X__ Statement under 37 CFR 1.97(e), or
____ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

____ under 37 CFR 1.97(d) together with a:
_____ Statement under 37 CFR 1.97(e), and
_____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

__X__ under 37 CFR 1.97(e),

____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

__X__ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: June 30, 2015
50 West Broadway, 10th Floor
Salt Lake City, UT 84101
Telephone (801) 994-4646
Fax (801) 531-1929

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/904,963	05/29/2013	Kelly D. Phillipps	3128.2.5	6149

36491 7590 05/15/2015

Kunzler Law Group
50 W. Broadway
10th Floor
SALT LAKE CITY, UT 84101

EXAMINER	
MISIR, DAYWAYSHWAR D	

ART UNIT	PAPER NUMBER
2129	

NOTIFICATION DATE	DELIVERY MODE
05/15/2015	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket@kunzlerlaw.com

Office Action Summary	Application No. 13/904,963	Applicant(s) PHILLIPPS ET AL.	
	Examiner DAVE MISIR	Art Unit 2129	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05/29/2013*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-26* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-26* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *05/29/2013* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date *See Continuation Sheet*.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

Continuation of Attachment(s) 2). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :05/29/2013,09/19/2013,03/06/2014,03/11/2014,04/08/2014,05/19/2014,06/24/2014,07/09/2014,09/17/2014,11/20/2014,04/03/2015.

DETAILED ACTION

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

This Office Action is sent in response to applicants communication received on 05/29/2013.

Claims 1-26 are presented for examination.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):

> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 8 is rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

Claim 8 recites the limitation "the adjusted one or more machine learning parameters" in lines 4-5. There is insufficient antecedent basis for this limitation in the claim.

The Examiner suggests that perhaps in line 2 of the claim just *before* the word “adjusted” the word parameters should be inserted.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14, 17-22 are rejected under 35 U.S.C. 103 as being unpatentable over **Ingargiola** R. et al., US PG Pub. No. 2005/0090911 A1.

With respect to **Claim 1**, Ingargiola teaches:

An apparatus for machine learning results, the apparatus comprising (Abstract; paragraph 12: wherein results from machine learning mechanisms are discussed and used):

an input module configured to receive user input identifying one or more values for one or more machine learning parameters (paragraphs 12-14, 47: wherein

collectively it is discussed, among other things, a user input device for adjusting parameters, indicators, advisor, that are machine learning based components);

a display module configured to display one or more machine learning results for the one or more identified machine learning parameters, the one or more machine learning results determined using machine learning (Abstract; paragraphs 12-13, 46: wherein the use of GUI for displaying machine learning results based on parameters, as previously mentioned, is discussed and used);

and an update module configured to dynamically update the displayed one or more machine learning results in response to the input module receiving additional user input identifying one or more additional values for the one or more machine learning parameters (paragraphs 96, 119, 123, 182, 186, 189: wherein it is discussed the re-specifying or modifying of parameters that necessarily updates the machine learning results).

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to use the teachings of Ingargiola for the purposes of dynamically updating and displaying one or more machine learning results, determined using machine learning, in response to receiving user inputs identifying one or more additional values for one or more machine learning parameters.

The ordinary artisan would have been motivated to modify/use Ingargiola in the manner set forth above for the purposes of predicting the behavior or performance of a system using an interactive and dynamic methodology that includes machine learning [Ingargiola: Abstract; paragraphs 12-16].

(Examiner's Note: Elad and Pinto would also in combination teach the limitations of the above claim, as well as Breckenridge, US 2012/0191631 A1, see PTO-892).

With respect to **Claim 2**, Ingargiola further teaches:

The apparatus of claim 1, further comprising a pre-compute module configured to predetermine, using the machine learning, permutations of the machine learning results at predefined increments between a minimum value for the one or more machine learning parameters and a maximum value for the one or more machine learning parameters, prior to the input module receiving the user input (paragraphs 47, 51, 104: wherein collectively it is discussed preprocessing and predicting, based on raw data and indicators and advisors, which are machine learning based components, and the use of moving average convergence divergence –MACD- which is necessarily a permutation/combination of time series data between specified minimum and maximum ranges).

With respect to **Claim 3**, Ingargiola further teaches:

The apparatus of claim 2, wherein the pre-compute module is configured to cache the predetermined permutations of the machine learning results for the update module in a results data structure indexed by the one or more machine learning parameters (paragraphs 51, 94-95, 117, 186: wherein collectively it is discussed,

among other things, the storing of user/default selections and the use of indicators in accessing and displaying specified file location/name data).

With respect to **Claim 4**, Ingargiola further teaches:

The apparatus of claim 3, wherein the pre-compute module is configured to determine the machine learning results by looking up the machine learning results in the results data structure using the one or more machine learning parameters (paragraphs 51, 94-95: wherein it is discussed the ability of the system to browse or look up file content).

With respect to **Claim 5**, Ingargiola further teaches:

The apparatus of claim 1, wherein the display module is configured to display one or more attributes of a data set used by the machine learning to determine the one or more machine learning results and one or more impact metrics for each displayed attribute (Fig. 1; paragraphs 13-14, 16: wherein it is shown and described the displaying of a plurality of factors that can be considered as attributes and active indicators that can be considered impact metrics).

With respect to **Claim 6**, Ingargiola further teaches:

The apparatus of claim 1, further comprising a predictive compiler module configured to generate the machine learning, the machine learning comprising program code for a plurality of learned functions from multiple machine learning

classes, the program code generated by the predictive compiler module to predict the machine learning results based on the one or more machine learning parameters (paragraphs 47, 49, 62, 92, 181: wherein collectively it is discussed the use of a plurality of machine learning based components and their parameters used in predicting results).

With respect to **Claim 7**, Ingargiola further teaches:

The apparatus of claim 1, further comprising a recommendation module configured to select a suggested set of machine learning results, the display module configured to display the suggested set of machine learning results to the user prior to the input module receiving the user input (paragraphs 46-47, 51: wherein it is discussed a user interface for, among other things, displaying recommendations to the user).

With respect to **Claim 8**, Ingargiola further teaches:

The apparatus of claim 1, wherein the one or more machine learning parameters comprise one or more of an input and an output of the machine learning adjusted by the user input and the machine learning results comprise one or more of an input and an output of the machine learning determined based on the adjusted one or more machine learning parameters (paragraph 96, 119, 123, 182, 186, 189: wherein it is discussed the user input re-specifying or modifying parameters that necessarily updates or adjusts the machine learning results).

With respect to **Claim 9**, Ingargiola further teaches:

The apparatus of claim 1, wherein the one or more machine learning parameters comprise one or more of an attribute of a feature, a target value for a goal, an action relating to a goal, a confidence metric, and a target of an action (paragraphs 128, 163, 175, 198-201: wherein it is discussed, among other things, the use of features and confidence levels or metrics).

With respect to **Claim 10**, Ingargiola further teaches:

The apparatus of claim 1, wherein the machine learning results comprise one or more of an attribute of a feature, a target value for a goal, an action relating to a goal, a confidence metric, and a target of an action (paragraphs 128, 163, 175, 198-201: wherein it is discussed, among other things, the use of features and confidence levels or metrics).

With respect to **Claim 11**, Ingargiola further teaches:

The apparatus of claim 1, wherein the input module is configured to receive the user input as an adjustment to a slider graphical user interface element corresponding to the one or more machine learning parameters (paragraph 202: wherein as discussed the user interface can include controls such as sliders).

With respect to **Claim 12**, Ingargiola further teaches:

The apparatus of claim 1, wherein the input module is configured to receive the user input as a user entry in a graphical table and the display module is configured to display the one or more machine learning results as entries in the graphical table (Fig. 21A; paragraphs 10, 117, 201: wherein it is shown and discussed the use of tables for receiving and displaying data).

With respect to **Claim 13**, Ingargiola further teaches:

The apparatus of claim 1, wherein the input module is configured to receive the user input as a user manipulation of a displayed object (paragraphs 83, 88, 202: wherein it is discussed the user input can include, among other methods, drag and drop of symbols or icons, or the use of sliders).

With respect to **Claim 14**, Ingargiola further teaches:

The apparatus of claim 13, wherein the user input comprises one or more of: an adjustment to a size of the displayed object; an adjustment to a vertical position of the displayed object; an adjustment to a horizontal position of the displayed object; an adjustment to an opacity of the displayed object; an adjustment to a color of the displayed object; an adjustment to a shape of the displayed object; an adjustment to shading of the displayed object; a text entry in a text box for the displayed object; and user interaction with an animation for the displayed object (paragraphs 83, 88, 201, 202: wherein collectively it is discussed the moving and

resizing of windows/displays for a custom view, the use of text boxes, sliders, and drag and drop of symbols or icons that represents a user interaction with objects).

With respect to **Claim 17**, Ingargiola teaches:

A method for machine learning results, the method comprising (Abstract; paragraph 12: wherein results from machine learning mechanisms are discussed and used):

inputting permutations of machine learning parameters incrementally between minimum values for the machine learning parameters and maximum values for the machine learning parameters into a predictive program (paragraphs 47, 51, 104: wherein collectively it is discussed preprocessing and predicting, based on raw data and indicators and advisors, which are machine learning based components, and the use of moving average convergence divergence –MACD- which is necessarily a permutation/combination of time series data between specified minimum and maximum ranges. And, paragraphs 47, 49, 62, 92, 181: wherein collectively it is discussed the use of a plurality of machine learning based components and their parameters used in predicting results, that would necessarily involve the use of a predictive program);

determining machine learning results from the predictive program for the input permutations of the machine learning parameters (Abstract; paragraphs 12, 47, 49, 62, 92-93, 181: wherein collectively it is discussed the use of a plurality of machine learning based components and their parameters used in predicting results);

and populating a results data structure with the determined machine learning results indexed by the machine learning parameters (Abstract; Fig. 21A and 22A; paragraphs 51, 94-95, 117, 186, 201: wherein collectively it is shown and discussed, among other things, the storing, displaying or populating, of user/default selections, and the use of indicators, that are machine learning based components, in accessing and displaying specified file location/name data).

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to use the teachings of Ingargiola for the purposes of inputting permutations of machine learning parameters incrementally between minimum values for the machine learning parameters and maximum values for the machine learning parameters into a predictive program; determining machine learning results from the predictive program for the input permutations of the machine learning parameters; and populating a results data structure with the determined machine learning results indexed by the machine learning parameters.

The ordinary artisan would have been motivated to modify/use Ingargiola in the manner set forth above for the purposes of predicting the behavior or performance of a system using an interactive and dynamic methodology that includes machine learning [Ingargiola: Abstract; paragraphs 12-16].

With respect to **Claim 18**, Ingargiola further teaches:

The method of claim 17, wherein the results data structure is populated prior to receiving user input identifying a value for a machine learning parameter

(paragraphs 47, 51: wherein it is discussed the use of prior data and previously stored predetermined selections).

With respect to **Claim 19**, Ingargiola further teaches:

The method of claim 17, further comprising dynamically displaying one or more corresponding machine learning parameters and machine learning results from the results data structure in response to user input selecting a value for one or more of a machine learning parameter and a machine learning result (paragraphs 13, 96, 123, 186: wherein it is discussed the displaying of results based on a user active selection of indicators, that are machine learning based components).

With respect to **Claim 20**, Ingargiola further teaches:

The method of claim 19, further comprising dynamically changing the displayed one or more corresponding machine learning parameters and machine learning results using the results data structure in response to user input adjusting a value for a machine learning parameter (paragraphs 13, 96, 111, 119: wherein it is discussed the changing of parameters that changes the displayed results).

With respect to **Claim 21**, Ingargiola further teaches:

The method of claim 19, further comprising dynamically changing the displayed one or more corresponding machine learning parameters and machine learning results using the results data structure in response to user input adjusting a

value for a machine learning result (Abstract; paragraphs 119, 182, 186, 192, 202: wherein it is collectively discussed changing parameters that subsequently changes what is displayed).

With respect to **Claim 22**, Ingargiola teaches:

A system for machine learning results, the system comprising (Abstract; paragraph 12: wherein results from machine learning mechanisms are discussed and used):

a pre-compute module configured to predetermine, using one or more predictive programs, permutations of machine learning results for each of the one or more predictive programs at predefined increments between minimum values for machine learning parameters and maximum values for the machine learning parameters (paragraphs 47, 51, 104: wherein collectively it is discussed preprocessing and predicting, based on raw data and indicators and advisors, which are machine learning based components, and the use of moving average convergence divergence – MACD- which is necessarily a permutation/combination of time series data between specified minimum and maximum ranges. And, paragraphs 47, 49, 62, 92, 181: wherein collectively it is discussed the use of a plurality of machine learning based components and their parameters used in predicting results, that would necessarily involve the use of a predictive program);

an input module configured to receive user input from multiple users identifying values for one or more of the machine learning parameters for the one or more predictive programs (paragraphs 12-14, 47, 56, 73: wherein collectively it is

discussed, among other things, a user input device for adjusting parameters, indicators, advisor, that are machine learning based components);

and a display module configured to display one or more of the predetermined machine learning results to the multiple users based on the identified values (Abstract; Fig. 26; paragraphs 12-13, 46, 56, 73: wherein the use of GUI for displaying machine learning results based on parameters, as previously mentioned, is discussed and used).

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to use the teachings of Ingargiola for the purposes of having a pre-compute module configured to predetermine, using one or more predictive programs, permutations of machine learning results for each of the one or more predictive programs at predefined increments between minimum values for machine learning parameters and maximum values for the machine learning parameters; an input module configured to receive user input from multiple users identifying values for one or more of the machine learning parameters for the one or more predictive programs; and a display module configured to display one or more of the predetermined machine learning results to the multiple users based on the identified values.

The ordinary artisan would have been motivated to modify/use Ingargiola in the manner set forth above for the purposes of predicting the behavior or performance of a system using an interactive and dynamic methodology that includes machine learning [Ingargiola: Abstract; paragraphs 12-16].

Claims 15-16, 23-24 are rejected under 35 U.S.C. 103 as being unpatentable over **Ingargiola** R. et al., US PG Pub. No. 2005/0090911 A1, in view of **Xu** Z. et al., US Patent No. 8260117 B1.

With respect to **Claim 15**, Ingargiola teaches:

The apparatus of claim 1,

configured to determine an impact on the one or more machine learning results based on different user input received from a different user (Fig. 26; Abstract; paragraphs 56, 73: wherein it is shown and discussed the use of multiple users whose inputs and information can be leveraged in determining settings and subsequent results, i.e., the users impact can be determined).

Ingargiola does not teach:

further comprising a collaboration module.

However, Xu shows (C2, L48-63; C4, L8-20: wherein the use of a collaboration algorithm is described).

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to use the teachings of Xu with that of Ingargiola for the purposes of having a collaboration module.

The ordinary artisan would have been motivated to modify Ingargiola in the manner set forth above for the purposes of satisfying a user interests and their one or more goals [Xu: C4, L8-20].

With respect to **Claim 16**, Ingargiola further teaches:

The apparatus of claim 15, wherein the input module is configured to receive the different user input from the different user, the different user input identifying a different value for a different machine learning parameter, the display module configured to display multiple sets of one or more machine learning results to multiple users, and the update module configured to dynamically update the displayed multiple sets of one or more machine learning results (paragraphs 12-14, 47, 56, 73: wherein collectively it is discussed, among other things, a user input device for adjusting parameters, indicators, advisor, that are machine learning based components. And, Abstract; Fig. 26; paragraphs 12-13, 46, 56, 73: wherein the use of GUI for displaying machine learning results based on parameters, as previously mentioned, is discussed and used; and as shown and discussed therein, these inputs/displays can be to/from multiple users. And, Abstract; paragraphs 119, 182, 186, 192, 202: wherein it is collectively discussed changing parameters that subsequently changes what is displayed).

With respect to **Claim 23**, Ingargiola teaches:

The system of claim 22,

configured to determine an impact on machine learning results from one of the predictive programs based on an identified value for a machine learning parameter for another of the predictive programs (paragraphs 47, 49, 62, 92, 181: wherein collectively it is discussed the use of a plurality of machine learning based

components and their parameters used in predicting results, that would necessarily involve the use of predictive programs, and further it is discussed how these parameters and results can subsequently influence other parameters and results).

Ingargiola does not teach:

further comprising a collaboration module.

However, Xu shows (C2, L48-63; C4, L8-20: wherein the use of a collaboration algorithm is described).

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to use the teachings of Xu with that of Ingargiola for the purposes of having a collaboration module.

The ordinary artisan would have been motivated to modify Ingargiola in the manner set forth above for the purposes of satisfying a user interests and their one or more goals [Xu: C4, L8-20].

With respect to **Claim 24**, Ingargiola further teaches:

The system of claim 23, wherein the multiple users identify the values for different predictive programs of the predictive programs (Abstract; Figs. 4, 7, 12 and 26; paragraphs 12-13, 47, 51, 60, 92, 104: wherein it shown and described how users can select and input various parameters for the machine learning mechanism).

Claim 25 is rejected under 35 U.S.C. 103 as being unpatentable over **Ingargiola** R. et al., US PG Pub. No. 2005/0090911 A1, in view of **Xu** Z. et al., US Patent No. 8260117 B1, and further in view of **Pelton** G. et al., US PG Pub. No. 2009/0222742 A1.

With respect to **Claim 25**, Ingargiola teaches:

The system of claim 24, wherein the display module is configured to display the impact on the machine learning results

for the multiple users and to display the machine learning results for the different predictive programs on different displays for the multiple users (Abstract; Fig. 26; paragraphs 12-13, 46, 56, 73: wherein the use of GUI for displaying machine learning results based on parameters, as previously mentioned, is discussed and used; and as shown and discussed therein, these inputs/displays can be to/from multiple users on different display devices).

Neither Ingargiola nor Xu teaches:

on a shared display.

But Pelton shows (paragraphs 31, 40: wherein it is described the use of a shared collaborative display or workspace).

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to use the teachings of Pelton with that of Ingargiola and Xu for the purposes of having a shared display.

The ordinary artisan would have been motivated to modify Ingargiola and Xu in the manner set forth above for the purposes of enhancing and supporting collaboration between users with similar or relevant tasks [Pelton: paragraphs 40].

Claim 26 is rejected under 35 U.S.C. 103 as being unpatentable over **Ingargiola** R. et al., US PG Pub. No. 2005/0090911 A1, in view of **Pelton** G. et al., US PG Pub. No. 2009/0222742 A1.

With respect to **Claim 26**, Ingargiola teaches:

The system of claim 22, wherein the input module is configured to receive the user input from one or more of: separate client devices for the multiple users over a data network (Abstract; Fig. 26; paragraphs 12-14, 44, 46-47, 56, 73: wherein collectively it is discussed, among other things, a user input device for adjusting parameters, indicators, advisor, that are machine learning based components; and as shown and discussed therein, these inputs/displays can be to/from multiple users on different display devices over a data network that consists of the necessary internet routers and servers).

Ingargiola does not teach:

and a shared interface for the multiple users on a single device.

But Pelton shows (paragraphs 31, 40: wherein it is described the use of a shared collaborative display or workspace for many users).

It would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to use the teachings of Pelton with that of Ingargiola for the purposes of having a shared interface for the multiple users on a single device. The ordinary artisan would have been motivated to modify Ingargiola in the manner set forth above for the purposes of enhancing and supporting collaboration between users with similar or relevant tasks [Pelton: paragraphs 40].

Examiner's Note:

The Examiner cites particular columns, line numbers, and paragraphs in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in its entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner and the additional related prior arts made of record that are considered pertinent to applicant's disclosure to further show the general state of the art. The Examiner's interpretations in parenthesis are provided with the cited references to assist the applicants to better understand how the examiner interprets the prior art to read on the claims. Such comments are entirely consistent with the intent and spirit of compact prosecution.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVE MISIR whose telephone number is (571)272-5243. The examiner can normally be reached on M-Th 7:30 - 5 PM, F 7:30 - 4 PM (Off Alternate Fridays).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 571-272-4146. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/JEFFREY A GAFFIN/
Supervisory Patent Examiner, Art Unit 2129

/DAVE MISIR/
Examiner, Art Unit 2129

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	Examiner DAVE MISIR	Art Unit 2129	Page 1 of 2

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*	C	US-7,480,640 B1	01-2009	Elad et al.	706/14
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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Notice of References Cited	Application/Control No. 13/904,963	Applicant(s)/Patent Under Reexamination PHILLIPPS ET AL.	
	Examiner DAVE MISIR	Art Unit 2129	Page 2 of 2

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	D	US-			
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13749618
	Filing Date	2013-01-24
	First Named Inventor	Richard W. Wellman
	Art Unit	3715
	Examiner Name	Xuan Marian Thai
	Attorney Docket Number	3128.2.3

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Receipt date: 09/19/2013	Application Number	13749618 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-01-24
	First Named Inventor	Richard W. Wellman
(Not for submission under 37 CFR 1.99)	Art Unit	3715
	Examiner Name	Xuan Marian Thai
	Attorney Docket Number	3128.2.3

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Receipt date: 09/19/2013	Application Number	13749618 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-01-24
	First Named Inventor	Richard W. Wellman
	Art Unit	3715
(Not for submission under 37 CFR 1.99)	Examiner Name	Xuan Marian Thai
	Attorney Docket Number	3128.2.3

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Examiner Signature	/Daywayshwar Misir/	Date Considered	04/07/2015

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.M./

Receipt date: 09/19/2013	Application Number	13749618 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-01-24
	First Named Inventor	Richard W. Wellman
(Not for submission under 37 CFR 1.99)	Art Unit	3715
	Examiner Name	Xuan Marian Thai
	Attorney Docket Number	3128.2.3

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2013-09-19
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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S3	29	(richard near2 wellman).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/03/31 16:34
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S5	6	(cloudvu).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 09:56
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S68	129	(predictive with (analytics or modeling)) and (machine adj learning) and ((dynamic or predictive) with (user adj interface))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 16:18
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S70	9	S65 and S69	US-PGPUB; USPAT	OR	ON	2015/04/01 16:20
S71	5	S66 and S69	US-PGPUB; USPAT	OR	ON	2015/04/01 16:23
S72	319	(adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 16:31
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S75	31	S66 and S73	US-PGPUB; USPAT	OR	ON	2015/04/01 16:36
S76	8	((adjust or vary or updat$3) with ((machine adj learning) with (parameter or result))) and (user with input with display$3 with updat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/01 16:40
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S78	23	(predictive with (analytics or modeling)) and (machine adj learning) and ((dynamic or predictive) with (user adj interface)) and ((large with data with set) or (big adj data))	US-PGPUB; USPAT; USOCR; FPRS;	OR	ON	2015/04/02 08:29

			EPO; JPO; DERWENT; IBM_TDB			
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S82	18	((permutat$4 or combinat$4 or variation) with (machine adj learning) with (result or parameter)) and (predictive with (analytics or modeling))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2015/04/02 08:45
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S86	38	S81 and S85	US-PGPUB; USPAT	OR	ON	2015/04/02 08:51
S87	15235	(g06n99/005;g06n5/04;g06n5/02;g06n5/025;g06n99/00;g06q30/0241;g06f3/048).cpc.	US-PGPUB; USPAT	OR	ON	2015/04/02 08:57
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4/ 7/ 2015 4:24:24 PM
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PTO/SB/08a (04-10)
Approved for use through 07/31/2012. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

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	1					
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090327172		2009-12-31	Liu, et al.	
	2	20040059966		2004-03-25	Chan, et al.	
	3	20050132052		2005-06-16	Uttamchandani, et al.	
	4	20050228789		2005-10-13	Fawcett, et al.	
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

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Receipt date: 03/06/2014	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
(Not for submission under 37 CFR 1.99)	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

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	1	Application No. PCT/US2013/077236, 3128.2.2pct, International Search Report and Written Opinion, February 24, 2014	☐

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	Examiner Name	Kakali Chaki
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☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-03-06
Name/Print	Scott C. Hilton	Registration Number	66011

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	Examiner Name	Daywayshwar D. Misir
	Attorney Docket Number	3128.2.5

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8271536		2012-09-18	Amradkar, et al.	
	2	8443438		2013-05-14	Sharir, et al.	
	3	8116207		2012-02-14	Schekochikhin, et al.	
	4	7996415		2011-08-09	Raffill, et al.	
	5	6018619		2000-01-25	Allard, et al.	
	6	3327291		1967-06-20	Lee	
	7	5719692		1998-02-17	Cohen	
	8	5832467		1998-11-03	Wavish	

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	9	7023979		2006-04-04	Wu, et al.	
	10	7600007		2009-10-06	Lewis	
	11	7890929		2011-02-15	Johanson	
	12	8572290		2013-10-29	Mukhopadhyay, et al.	

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	1	20130004930		2013-01-03	Sorenson, et al.	
	2	20100131314		2010-05-27	Lo Yuk Ting, et al.	
	3	20110184575		2011-07-28	Kawamoto, et al.	
	4	20100138026		2010-06-03	Kaushal, et al.	
	5	20020159641		2002-10-31	Whitney, et al.	

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	6	20040059966		2004-03-25	Chan, et al.	
	7	20040078175		2004-04-22	Shaw, et al.	
	8	20050076245		2005-04-07	Graham, et al.	
	9	20050132052		2005-06-16	Uttamchandani, et al.	
	10	20050228789		2005-10-13	Fawcett, et al.	
	11	20050267913		2005-12-01	Stienhans, et al.	
	12	20060247973		2006-11-02	Mueller, et al.	
	13	20070043690		2007-02-22	Inakoshi, et al.	
	14	20070112824		2007-05-17	Lock, et al.	
	15	20090089078		2009-04-02	Bursey	
	16	20090327172		2009-12-31	Liu, et al.	

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	17	20090023798		2010-01-28	Meijer, et al.	
	18	20100138026		2010-06-03	Kaushal, et al.	
	19	20110302153		2011-12-08	Meretakis, et al.	
	20	20130218042		2013-08-22	Mardirossian	
	21	20140136452		2014-05-15	Wellman, et al.	
	22	20140180738		2014-06-26	Phillipps, et al.	
	23	20140205990		2014-07-24	Wellman, et al.	
	24	20140195466		2014-07-10	Phillipps, et al.	
	25	20140236875		2014-08-21	Phillipps, et al.	
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	27	20140358825		2014-12-04	Phillipps, et al.	

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	28	20140372513		2014-12-18	Jones	
	29	20140372346		2014-12-18	Phillipps, et al.	
	30	20150058266		2015-02-26	Wellman, et al.	

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	1	Application No. PCT/US14/42104, 3128.2.12PCT, International Search Report and Written Opinion, December 17, 2014	☐
	2	Application No. 13/749,618, 3128.2.3, Office Action, December 22, 2014	☐
	3	CABENA, ET AL., "Intelligent Miner for Data Applications Guide", IBM, 1998, pgs. 89-103	☐

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	4	Application No. 13/725,995, 3128.2.2, Office Action, April 2, 2015	☐
	5	ILIJASIC, LOVRO, "Computational Grids as Complex Networks", Torino, 2010	☐
	6	"HP Process Resource Manager User's Guide", Hewlett-Packard Development Company, Version C.03.05, January 2009	☐

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SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/904,963	05/29/2013 RULE	706	2129	3128.2.5

APPLICANTS
CloudVu, Inc., Sandy, UT

INVENTORS
Kelly D. Phillipps, Salt Lake City, UT;
Richard W. Wellman, Park City, UT;

** **CONTINUING DATA** **********

** **FOREIGN APPLICATIONS** **********

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Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /DAVE D MISIR/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
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10th Floor
SALT LAKE CITY, UT 84101
UNITED STATES

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	1	Application No. 13/749,618, 3128.2.3, Office Action, July 8, 2014	☐
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Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-07-09
Name/Print	Scott C. Hilton	Registration Number	66011

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7689520		2010-03-30	Burges, et al.	

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	1	20100306141		2010-12-02	Chidlovskii	
	2	20120158620		2012-06-21	Paquet, et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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Receipt date: 09/17/2014	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
(Not for submission under 37 CFR 1.99)	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. PCT/US14/10729, 3128.2.4PCT, International Search Report and Written Opinion, August 28, 2014	☐

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Examiner Signature	/Daywayshwar Misir/	Date Considered	04/07/2015

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Receipt date: 09/17/2014	Application Number	13904963	13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-05-29	
	First Named Inventor	Kelly D. Phillipps	
	Art Unit	2122	
	Examiner Name	Kakali Chaki	
	Attorney Docket Number	3128.2.5	

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Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-09-16
Name/Print	Scott C. Hilton	Registration Number	66011

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8260117		2012-09-04	Xu, et al.	
	2	5963910		1999-10-05	Ulwick	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050090911		2005-04-28	Ingargiola, et al.	
	2	20090222742		2009-09-03	Pelton, et al.	
	3	20030069869		2003-04-10	Gronau, et al.	
	4	20130066886		2013-03-14	Bagchi, et al.	

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Receipt date: 11/20/2014	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

	5	20080313110		2008-12-18	Kreamer, et al.	
	6	20120330971		2012-12-27	Thomas, et al.	
	7	20100145902		2010-06-10	Boyan, et al.	
	8	20050278362		2005-12-15	Maren, et al.	

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	1	Application No. PCT/US14/39859, 3128.2.5PCT, International Search Report and Written Opinion, October 16, 2014	☐
	2	Application No. PCT/US14/39861, 3128.2.7PCT, International Search Report and Written Opinion, October 16, 2014	☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
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	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

	3	Application No. PCT/US14/42754, 3128.2.8PCT, International Search Report and Written Opinion, October 15, 2014	☐

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13904963	PHILLIPPS ET AL.
	Examiner	Art Unit
	DAVE MISIR	2129

CPC- SEARCHED		
Symbol	Date	Examiner
G06N 99/005, 99/00, 5/04, 5/02, 5/025; G06Q 30/0241; G06F 3/048	4/7/2015	DM

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
706	11-12. With Keywords: predictive analytics/modeling, machine learning, dynamic/predictive user interface, large data set/big data, permutation/combination/variation machine learning results/parameters, update/adjust machine learning parameters/result.	4/7/2015	DM

SEARCH NOTES		
Search Notes	Date	Examiner
See EAST search history attached	4/7/2015	DM
Inventor name search in PALM	4/7/2015	DM
NPL search - Google Scholar.	4/7/2015	DM
InnovationQ - IP.com	4/7/2015	DM

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8214308		2012-07-03	Chu	
	2	8370280		2013-02-05	Lin, et al.	
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20140136452		2014-05-15	Wellman, et al.	
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Receipt date: 06/24/2014	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
(Not for submission under 37 CFR 1.99)	Art Unit	2122
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	Attorney Docket Number	3128.2.5

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. 13/870,861, 3128.2.1US1, Notice of Allowance, June 20, 2014	☐
	2	BENNETT, CASEY C., "EHRs Connect Research and Practice: Where Predictive Modeling, Artificial Intelligence, and Clinical Decision Support Intersect", Health Policy and Technology (2012), pgs. 24	☐

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Receipt date: 06/24/2014	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

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Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-06-20
Name/Print	Scott C. Hilton	Registration Number	66011

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	Application Number	
	Filing Date	
	First Named Inventor	Kelly D. Phillipps
	Art Unit	
	Examiner Name	
	Attorney Docket Number	3128.2.5

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7219085		2007-05-15	Buck, et al.	
	2	7814194		2010-10-12	Hellerstein, et al.	
	3	8160981		2012-04-17	Aparicio, IV	
	4	6523015		2003-02-18	Bera, et al.	
	5	6112304		2000-08-29	Clawson	
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	1	20110119300		2011-05-19	Marcade	
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Receipt date: 05/29/2013	Application Number	13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	
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	1	McTIGUE, JAKE, "Predictive Analytics for IT", Information Week, March 2012, pgs. 17	☐
	2	PURPURA, STEPHEN, "Statistically Adaptive Learning for a General Class of Cost Functions (SA L-BFGS)", September 5, 2012, pgs. 7, arXiv:1209.0029v3 [cs.LG]	☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6507726		2003-01-14	Atkinson, et al.	
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	1	20090186329		2009-07-23	Connor	
	2	20090035733		2009-02-05	Meitar, et al.	
	3	20100009330		2010-01-14	Yaskin	
	4	20070111179		2007-05-17	Hochwarth, et al.	
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	1	102010046439	DE		2012-03-29	Landwehr		☐

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	1	Application No. PCT/US2014/013028, 3128.2.3pct, International Search Report and Written Opinion, May 15, 2014	☐

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	1	8209274		2012-06-26	Lin, et al.	
	2	8209271		2012-06-26	Lin, et al.	
	3	8229864		2012-07-24	Lin, et al.	
	4	8250009		2012-08-21	Breckenridge, et al.	
	5	8311967		2012-11-13	Lin, et al.	
	6	8370279		2013-02-05	Lin, et al.	
	7	8527324		2013-09-03	Richter	

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	1	20080162487		2008-07-03	Richter	
	2	20090254379		2009-10-08	Adams, et al.	
	3	20100114663		2010-05-06	Casas, et al.	
	4	20100223212		2010-09-02	Manolescu, et al.	
	5	20110137672		2011-06-09	Adams, et al.	
	6	20120004893		2012-01-05	VAIDYANATHAN, et al.	
	7	20120030160		2012-02-02	Ratnam, et al.	
	8	20120191630		2012-06-26	Breckenridge, et al.	
	9	20120191631		2012-07-26	Breckenridge, et al.	
	10	20120284600		2012-11-08	Lin, et al.	

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Receipt date: 04/08/2014	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
(Not for submission under 37 CFR 1.99)	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

	11	20120284213		2012-11-08	Lin, et al.	
	12	20120284212		2012-11-08	Lin, et al.	

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	1	Application No. 13/870,861, 3128.2.1US1, Office Action, April 8, 2014	☐

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Examiner Signature	/Daywayshwar Misir/	Date Considered	04/07/2015

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	Art Unit	2122
	Examiner Name	Kakali Chaki
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Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-04-08
Name/Print	Scott C. Hilton	Registration Number	66011

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	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8209271		2012-06-26	Lin, et al.	
	2	8229864		2012-07-24	Lin, et al.	
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20120191631		2012-07-26	Breckenridge, et al.	
	2	20120158624		2012-06-21	Lingenfelder, et al.	
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2012151198	WO		2012-11-08	Google, Inc.		☐

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Receipt date: 03/11/2014	Application Number	13904963 13904963 - GAU: 2129
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
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	1	Application No. PCT/US2013/070358, 3128.2.1pct, International Search Report and Written Opinion, February 28, 2014	☐
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Application Number	13904963
Filing Date	2013-05-29
First Named Inventor	Kelly D. Phillipps
Art Unit	2129
Examiner Name	Daywayshwar D. Misir
Attorney Docket Number	3128.2.5

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	1	8271536		2012-09-18	Amradkar, et al.	
	2	8443438		2013-05-14	Sharir, et al.	
	3	8116207		2012-02-14	Schekochikhin, et al.	
	4	7996415		2011-08-09	Raffill, et al.	
	5	6018619		2000-01-25	Allard, et al.	
	6	3327291		1967-06-20	Lee	
	7	5719692		1998-02-17	Cohen	
	8	5832467		1998-11-03	Wavish	

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	Examiner Name	Daywayshwar D. Misir
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	9	7023979		2006-04-04	Wu, et al.	
	10	7600007		2009-10-06	Lewis	
	11	7890929		2011-02-15	Johanson	
	12	8572290		2013-10-29	Mukhopadhyay, et al.	

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	1	20130004930		2013-01-03	Sorenson, et al.	
	2	20100131314		2010-05-27	Lo Yuk Ting, et al.	
	3	20110184575		2011-07-28	Kawamoto, et al.	
	4	20100138026		2010-06-03	Kaushal, et al.	
	5	20020159641		2002-10-31	Whitney, et al.	

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	6	20040059966		2004-03-25	Chan, et al.	
	7	20040078175		2004-04-22	Shaw, et al.	
	8	20050076245		2005-04-07	Graham, et al.	
	9	20050132052		2005-06-16	Uttamchandani, et al.	
	10	20050228789		2005-10-13	Fawcett, et al.	
	11	20050267913		2005-12-01	Stienhans, et al.	
	12	20060247973		2006-11-02	Mueller, et al.	
	13	20070043690		2007-02-22	Inakoshi, et al.	
	14	20070112824		2007-05-17	Lock, et al.	
	15	20090089078		2009-04-02	Bursey	
	16	20090327172		2009-12-31	Liu, et al.	

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	17	20090023798		2010-01-28	Meijer, et al.	
	18	20100138026		2010-06-03	Kaushal, et al.	
	19	20110302153		2011-12-08	Meretakis, et al.	
	20	20130218042		2013-08-22	Mardirossian	
	21	20140136452		2014-05-15	Wellman, et al.	
	22	20140180738		2014-06-26	Phillipps, et al.	
	23	20140205990		2014-07-24	Wellman, et al.	
	24	20140195466		2014-07-10	Phillipps, et al.	
	25	20140236875		2014-08-21	Phillipps, et al.	
	26	20140358828		2014-12-04	Phillipps, et al.	
	27	20140358825		2014-12-04	Phillipps, et al.	

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	28	20140372513		2014-12-18	Jones	
	29	20140372346		2014-12-18	Phillipps, et al.	
	30	20150058266		2015-02-26	Wellman, et al.	

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	1	Application No. PCT/US14/42104, 3128.2.12PCT, International Search Report and Written Opinion, December 17, 2014	☐
	2	Application No. 13/749,618, 3128.2.3, Office Action, December 22, 2014	☐
	3	CABENA, ET AL., "Intelligent Miner for Data Applications Guide", IBM, 1998, pgs. 89-103	☐

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	Attorney Docket Number	3128.2.5

	4	Application No. 13/725,995, 3128.2.2, Office Action, April 2, 2015	☐
	5	ILIJASIC, LOVRO, "Computational Grids as Complex Networks", Torino, 2010	☐
	6	"HP Process Resource Manager User's Guide", Hewlett-Packard Development Company, Version C.03.05, January 2009	☐

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Examiner Signature		Date Considered	

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Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2015-04-03
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: Scott C. Hilton
8 East Broadway
Suite 600
Salt Lake City, Utah 84111
United States of America

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 17 DEC 2014
Applicant's or agent's file reference 31282-12pct	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US14/42104	International filing date *(day/month/year)* 12 June 2014 (12.06.2014)
Applicant PUREPREDICTIVE, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau of WIPO preferably through ePCT or on paper to, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **19 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Shane Thomas PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2014)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 31282-12pct	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US14/42104	International filing date *(day/month/year)* 12 June 2014 (12.06.2014)	(Earliest) Priority Date *(day/month/year)* 12 June 2013 (12.06.2013)
Applicant PUREPREDICTIVE, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☒ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

   a. the figure of the **drawings** to be published with the abstract is Figure No. 3

   ☒ as suggested by the applicant.

   ☐ as selected by this Authority, because the applicant failed to suggest a figure.

   ☐ as selected by this Authority, because this figure better characterizes the invention.

   b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US14/42104

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fee must be paid.

Group I: Claims 1-18 are directed toward a method and apparatus for multi-tenant enabling a single-tenant computer program product.

Group II: Claims 19-25 are directed toward a method for capturing data packets.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

-***-See Supplemental Page-***-

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-18

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US14/42104

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/173, 17/30, 21/50 (2014.01)
CPC - G06F 15/173, 17/30002, 21/50
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) Classifications: G06F 15/173, 17/30, 21/50 (2014.01)
CPC Classifications: G06F 15/173, 17/30002, 21/50; USPC Classifications: 707/802; 709/229; 726/4

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); ProQuest; IP.com; Google; multiple, numerous, plural, many, user, tenant, tenancy, application, program, service, enable, implement, single, solo, singular, individual, tag, associate

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 8271536 B2 (AMRADKAR, P et al.) September 18, 2012; abstract; figure 1B; column 2, lines 45-63; column 5, lines 39-42, 53-67; column 6, line 1; column 8, lines 40-67	1, 9-11, 18 --- 2-8, 12-17
Y	US 8443438 B1 (SHARIR, A et al.) May 14, 2013; figure 2; column 5, lines 37-67	2-6, 12-16
Y	US 8116207 B2 (SCHEKOCHIKHIN, A et al.) February 14, 2012; abstract; column 1, lines 32-42; column 17, lines 32-35; column 18, lines 17-22, 50-56	3-6, 13-16
Y	US 7996415 B1 (RAFFILL, T et al.) August 9, 2011; figure 1A; column 3, lines 47-49	7, 8, 17
Y	US 6018619 A (ALLARD, J et al.) January 25, 2000; column 16, lines 24-28	8

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 November 2014 (11.11.2014)	17 DEC 2014

Name and mailing address of the ISA/US	Authorized officer:
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US14/42104

-***-Continued from Box III: Lack of Unity of Invention-***-
The special technical features of Group I include tagging data associated with multiple tenants, a tag being uniquely associated with a tenant; providing the data to a single-tenant computer program product, the data associated with the multiple tenants; and presenting a user interface to a single tenant based on one or more tags associated with the single tenant, which are not present in Group II.

The special technical features of Group II include capturing, within a first computing device, data packets for the first computing device using a packet capturing module executing on the first computing device, the data packets comprising an identifier for a first destination; encapsulating the captured data packets with a packet header comprising an identifier for a second destination associated with a second computing device; and sending the encapsulated data packets to a packet receiving module executing on the second computing device, the packet receiving module configured to unencapsulate the encapsulated data packets and forward the unencapsulated data packets to a packet processing module executing on a third computing device associated with the first destination, which are not present in Group I.

The common technical feature shared by Groups I and II is sending data comprising an identifier to a computer program product.

However, these common features are previously disclosed by US 2013/0074091 A1 to Xavier, F et al. (hereinafter 'Xavier'). Xavier discloses sending data comprising an identifier to a computer program product (resource requests sent to a multi-tenant computer storage system are tagged with a tenant identity, paragraphs [0028]-[0036]).

Since the common technical features are previously disclosed by the Xavier reference, these common features are not special and so Groups I and II lack unity.

Form PCT/ISA/210 (extra sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: Scott C. Hilton
8 East Broadway
Suite 600
Salt Lake City, Utah 84111
United States of America

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	17 DEC 2014
Applicant's or agent's file reference 31282-12pct	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US14/42104	12 June 2014 (12.06.2014)	12 June 2013 (12.06.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/173, 17/30, 21/50 (2014.01)
CPC - G06F 15/173, 17/30002, 21/50

Applicant PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	11 November 2014 (11.11.2014)	Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/42104

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12,3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/42104

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:

   ☐ paid additional fees.

   ☐ paid additional fees under protest and, where applicable, the protest fee.

   ☐ paid additional fees under protest but the applicable protest fee was not paid.

   ☒ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fee must be paid.

Group I: Claims 1-18 are directed toward a method and apparatus for multi-tenant enabling a single-tenant computer program product.

Group II: Claims 19-25 are directed toward a method for capturing data packets.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical features of Group I include tagging data associated with multiple tenants, a tag being uniquely associated with a tenant; providing the data to a single-tenant computer program product, the data associated with the multiple tenants; and presenting a user interface to a single tenant based on one or more tags associated with the single tenant, which are not present in Group II.

The special technical features of Group II include capturing, within a first computing device, data packets for the first computing device using a packet capturing module executing on the first computing device, the data packets comprising an identifier for a first destination; encapsulating the captured data packets with a packet header comprising an identifier for a second destination associated with a second computing device; and sending the encapsulated data packets to a packet receiving module executing on the second computing device, the packet receiving module configured to unencapsulate the encapsulated data packets and forward the unencapsulated data packets to a packet processing module executing on a third computing device associated with the first destination, which are not present in Group I.

The common technical feature shared by Groups I and II is sending data comprising an identifier to a computer program product.

However, these common features are previously disclosed by US 2013/0074091 A1 to Xavier, F et al. (hereinafter 'Xavier'). Xavier discloses sending data comprising an identifier to a computer program product (resource requests sent to a multi-tenant computer storage system are tagged with a tenant identity, paragraphs [0028]-[0036]).

Since the common technical features are previously disclosed by the Xavier reference, these common features are not special and so Groups I and II lack unity.

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-18

Form PCT/ISA/237 (Box No. IV) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/42104

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	2-8, 12-17	YES
	Claims	1, 9-11, 18	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-18	NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims	NONE	NO

2. Citations and explanations:

Claims 1, 9-11 and 18 lack novelty under PCT Article 33(2) as being anticipated by US 8,271,536 B2 to Amradkar et al. (hereinafter 'Amradkar').

As per claims 1 and 11, Amradkar discloses a method and apparatus for multi-tenant enabling a single-tenant computer program product (implementing a multi-tenancy service component configured to provide multi-tenancy capabilities for submitted services, where a computer system instantiates a hosting service that includes a multi-tenancy component configured to provide resource access to multiple users through a single multi-tenant resource instance; abstract; column 2, lines 45-51), the method and apparatus comprising: a layer communication gateway module configured to tag data associated with multiple tenants, a tag being uniquely associated with a tenant (multi-tenancy component (layer communication gateway module) provides resource access for multiple users through a single multi-tenant resource instance, where each user provides a resource instance claim (tag) indicating a resource instance level authorization for the user (tag data associated with multiple tenants, each tag being uniquely associated with a tenant); abstract; figure 1B; column 2, lines 55-63; column 5, lines 39-42); a common repository module configured to provide the data to a single-tenant computer program product, the data associated with the multiple tenants (upon authenticating the user's validated security token, and verifying the user's resource instance claim, authentication database 170 (common repository module) sends reply 172 to instance 125, indicating that the user is or is not authorized to access resource 118; figure 1B; column 5, lines 53-61); and a user interface gateway module configured to present a user interface for the computer program product to a single tenant based on one or more tags associated with the single tenant (upon receiving an indication that both user 155 and user 156 are authorized and have valid resource instance claims (tags), each user's resource claim 161 is sent to store 130, whereupon resources 118 are sent to and provided to each user by multi-tenant resource instance 125; figure 1B; column 5, lines 64-67; column 6, line 1).

As per claims 9 and 18, Amradkar discloses the method of claim 1 and the apparatus of claim 11, and Amradkar discloses further comprising organizing the data into one or more user interface components and storing data associated with the one or more user interface components in a user interface server (online hosting service 110 may include a plug-in configured to authorize tenants at an operation level; the plug-in may provide an application programming interface (API) for creating, updating and deleting resource instance claims; column 8, lines 40-47).

As per claim 10, Amradkar discloses the method of claim 9, further comprising querying a data store associated with one or more user interface servers to locate a user interface server comprising data having a tag associated with the single tenant (an API may be used to create, delete, and/or update resource instance claims (tags) 161A and/or 161B; hosting module 115 may receive submitted service 106 submitted to be hosted by online hosting service 110; submitted service 106 may include a portion of use information 107 usable to configure various parameters of multi-tenancy component 121; use information 107 may be used to set a variety of parameters regarding component use in association with submitted service 106; column 8, lines 47-67).

Claims 2 and 12 lack an inventive step under PCT Article 33(3) as being obvious over Amradkar in view of US 8,443,438 B1 to Sharir et al. (hereinafter 'Sharir').

As per claims 2 and 12, Amradkar discloses the method of claim 1 and the apparatus of claim 11, but Amradkar does not disclose wherein providing the data comprises forwarding the data from one or more monitoring agents to one or more monitoring servers executing the single-tenant computer program product, a monitoring agent being assigned to a monitoring server, the one or more monitoring agents associated with the multiple tenants. Sharir does disclose wherein providing the data comprises forwarding the data from one or more monitoring agents to one or more monitoring servers executing the single-tenant computer program product, a monitoring agent being assigned to a monitoring server, the one or more monitoring agents associated with the multiple tenants (agents are deployed in conjunction with one or more known application components; traffic flowing to and from the application component is monitored to identify unknown or unmonitored application components; the agents can be implemented to deploy software at any layer in a tiered architecture (e.g., at web servers, application servers, database servers or other servers or components); figure 2; column 5, lines 37-67). It would have been a matter of obvious experimentation to a person of ordinary skill in the art, at the time of the invention, to modify the Amradkar invention to provide wherein providing the data comprises forwarding the data from one or more monitoring agents to one or more monitoring servers executing the single-tenant computer program product, a monitoring agent being assigned to a monitoring server, the one or more monitoring agents associated with the multiple tenants, as taught by Sharir, in order to provide a means to identify unknown application components, improving system security and reliability.

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/42104

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

-***-Continued from Box V: Citations and Explanations-***-
Claims 3-6 and 13-16 lack an inventive step under PCT Article 33(3) as being obvious over Amradkar in view of Sharir and further in view of US 8,116,207 B2 to Schekochikhin et al. (hereinafter 'Schekochikhin').

As per claims 3 and 13, Amradkar and Sharir, in combination, disclose the method of claim 2 and the apparatus of claim 12, but Amradkar does not disclose further comprising logging an assignment of a monitoring agent to a monitoring server such that data comprising one or more tags associated with the single tenant is tracked to the assigned monitoring server. Schekochikhin discloses further comprising logging an assignment of a monitoring agent to a monitoring server such that data comprising one or more tags associated with the single tenant is tracked to the assigned monitoring server (establishing, by an appliance, a plurality of agents, the plurality of agents monitoring a service executing on a server, and each agent having an assigned weight; abstract; column 1, lines 32-42). It would have been a matter of obvious experimentation to a person of ordinary skill in the art, at the time of the invention, to modify the Amradkar invention to provide logging an assignment of a monitoring agent to a monitoring server such that data comprising one or more tags associated with the single tenant is tracked to the assigned monitoring server, as taught by Schekochikhin, in order to provide a means for an appliance to determine whether a service is available based on availability reports from more than one monitoring agent.

As per claims 4 and 14, Amradkar and Sharir, in combination, disclose the method of claim 2 and the apparatus of claim 12, but Amradkar does not disclose wherein the data comprises one or more monitor agent event messages generated by the one or more monitoring agents. Schekochikhin discloses wherein the data comprises one or more monitor agent event messages generated by the one or more monitoring agents (a branch office appliance 200
requests information from connected servers 106 upon an event, such as receiving a request from a client 102, or receiving a DNS request; the information requested may comprise any operational or performance characteristic; column 17, lines 32-35). It would have been a matter of obvious experimentation to a person of ordinary skill in the art, at the time of the invention, to modify the Amradkar invention to provide wherein the data comprises one or more monitor agent event messages generated by the one or more monitoring agents, as taught by Schekochikhin, in order to provide a means for obtaining event information such as operational or performance characteristics.

As per claims 5 and 15, Amradkar, Sharir and Schekochikhin, in combination, disclose the method of claim 4 and the apparatus of claim 14, but Amradkar does not disclose further comprising translating the one or more monitor agent event messages such that the one or more monitor agent event messages are readable by the single-tenant computer program product. Schekochikhin discloses further comprising translating the one or more monitor agent event messages such that the one or more monitor agent event messages are readable by the single-tenant computer program product (in order to seamlessly splice communications from a client 102 to a server 106 via a pooled transport layer connection, the appliance 200 translates or multiplexes communications by modifying sequence number and acknowledgment numbers at the transport layer protocol level; column 18, lines 17-22). It would have been a matter of obvious experimentation to a person of ordinary skill in the art, at the time of the invention, to modify the Amradkar invention to provide translating the one or more monitor agent event messages such that the one or more monitor agent event messages are readable by the single-tenant computer program product, as taught by Schekochikhin, in order to provide for smoother connectivity between system components.

As per claims 6 and 16, Amradkar and Sharir, in combination, disclose the method of claim 2 and the apparatus of claim 12, but Amradkar does not disclose further comprising selecting a monitoring server to process one or more monitor agent event messages based on one or more processing criteria. Schekochikhin discloses further comprising selecting a monitoring server to process one or more monitor agent event messages based on one or more processing criteria (the health monitoring programs 216 of the appliance 200 monitor the health of servers to determine the server 106 for which to distribute a client's request; if the appliance 200 detects a server 106 is not available or has a load over a predetermined threshold, the appliance 200 can direct or distribute client requests to another server 106; column 18, lines 50-56). It would have been a matter of obvious experimentation to a person of ordinary skill in the art, at the time of the invention, to modify the Amradkar invention to provide selecting a monitoring server to process one or more monitor agent event messages based on one or more processing criteria, as taught by Schekochikhin, in order to provide the ability to select a specific server for processing requests.

Claims 7 and 17 lack an inventive step under PCT Article 33(3) as being obvious over Amradkar in view of US 7,996,415 B1 to Raffill et al. (hereinafter 'Raffill').

As per claims 7 and 17, Amradkar discloses the method of claim 1 and the apparatus of claim 11, but Amradkar does not disclose further comprising providing data processed by the single-tenant computer program product to a pattern recognition engine, the processed data having one or more tags associated with a single tenant. Raffill does disclose further comprising providing data processed by the single-tenant computer program product to a pattern recognition engine, the processed data having one or more tags associated with a single tenant (a pattern matching engine that performs on-the-fly pattern recognition; figure 1A; column 3, lines 47-49). It would have been a matter of obvious experimentation to a person of ordinary skill in the art, at the time of the invention, to modify the Amradkar invention to provide providing data processed by the single-tenant computer program product to a pattern recognition engine, the processed data having one or more tags associated with a single tenant, as taught by Raffill, in order to provide additional versatility and functionality to the system.

-***-Continued Within the Next Supplemental Box-***-

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

-***-Continued from Previous Supplemental Box-***-
Claim 8 lacks an inventive step under PCT Article 33(3) as being obvious over Amradkar in view of Raffill and further in view of US 6,018,619 A to Allard et al. (hereinafter 'Allard').

As per claim 8, Amradkar and Raffill, in combination, disclose the method of claim 7, but Amradkar does not disclose further comprising querying a data store associated with one or more assigned monitoring servers to locate the assigned monitoring server comprising the processed data having one or more tags associated with the single tenant. Allard discloses further comprising querying a data store associated with one or more assigned monitoring servers to locate the assigned monitoring server comprising the processed data having one or more tags associated with the single tenant (identifying a designated server for receiving tracked session events; column 16, lines 24-28). It would have been a matter of obvious experimentation to a person of ordinary skill in the art, at the time of the invention, to modify the
Amradkar invention to provide querying a data store associated with one or more assigned monitoring servers to locate the assigned monitoring server comprising the processed data having one or more tags associated with the single tenant, as taught by Allard, in order to provide the system with the ability to identify a particular monitoring server.

Claims 1-18 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

PCT Recordation of Search History

Case/PCT Application Number: PCT/US14/42104

CLIN Number/Technical Field of PCT Application: 005

Date(s) during which the search was conducted: 10-11 November 2014

Date of Completion of Recordation of Search History Form: 11 November 2014

Research Analyst Initials: JCA

Search Approval Official (SAO) Initials: CEH

Field of Search/Classification Information:

IPC(8) Classifications: G06F 15/173, 17/30, 21/50 (2014.01)

CPC Classifications: G06F 15/173, 17/30002, 21/50

USPC Classifications: 707/802; 709/229; 726/4

Database(s) Searched (Patent and Non-Patent Literature (NPL), Including Sub-Databases and Files Searched) and Search Terms Used:

MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); ProQuest; IP.com; Google; multiple, numerous, plural, many, user, tenant, tenancy, application, program, service, enable, implement, single, solo, singular, individual, tag, associate

Database Search String Recordation, Including Dates of Searches:

MicroPatent

10 November 2014

Assignee/Applicant PUREPREDICTIVE INC

Inventor(s) JONES, Bradley W

Any Classification 707802 or 709229 or 726004 and (locat* or identif*) near6 (monitoring or tracking) near5 server*

Any Classification 707802 or 709229 or 726004 or G06F001730 and pattern* near4 recogni* near6 engine*

Any Classification 709 and ((monitoring or track*) near5 agent*) same (assign* near6 server*)

Any Classification 709 and (monitoring or track*) near5 agent* near5 server*

((multiple or many or plural* or numerous) near4 (user* or tenant* or tenancy) near6 (application* or program* or service*)) same ((enabl* or implement*) near5 (single or solo or singular)) and ((tag*4 or associat*) near6 (user* or tenant*))

(multiple or many or plural* or numerous) and (user* or tenant* or tenancy) and (application* or program* or service*) and (enabl* or implement*) and (single or solo or singular) and (tag*4 or associat*)

11 November 2014

Any Classification G06F0015173 or G06F001730 or G06F002150 and ((multiple or many or plural* or numerous) near4 (user* or tenant* or tenancy) near6 (application* or program* or service*)) same ((enabl* or implement*) near5 (single or solo or singular)) and ((tag*4 or associat*) near6 (user* or tenant*))

ProQuest

11 November 2014

cpc("G06F 15/173" OR "G06F 17/30002" OR "G06F 21/50") AND ((multi OR many OR plural) NEAR/5 (tenant OR user OR client) NEAR/5 (program OR application OR software) NEAR/10 (enable OR implement OR allow) NEAR/8 (single OR singular OR individual) NEAR/5 (instance OR usage OR user OR tenant))

cpc("G06F 15/173" OR "G06F 17/30002" OR "G06F 21/50") AND ((multi OR many OR plural) NEAR/5 (tenant OR user OR client) NEAR/5 (program OR application OR software) NEAR/30 (enable OR implement OR allow) NEAR/8 (single OR singular OR individual) NEAR/5 (instance OR usage OR user OR tenant))

cpc("G06F 15/173" OR "G06F 17/30002" OR "G06F 21/50") AND ((multi OR many OR plural) NEAR/5 (tenant OR user OR client) NEAR/5 (program OR application OR software OR architecture OR platform) NEAR/30 (single OR singular OR individual) NEAR/5 (instance OR usage OR user OR tenant))

Patent Database Search Strategy/Results:

#	results	criteria	last run
12	35 hits	Any Classification G06F0015173 or G06F001730 or G06F002150 ((multiple or many or plural* or numerous) near4 (user* or tenant* or tenancy) near6 (application* or program* or service*)) same ((enabl* or implement*) near5 (single or solo or singular)) and ((tag*4 or associat*) near6 (user* or tenant*)) Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	2014-11-11
11	75 hits	Any Classification 707802 or 709229 or 726004 (locat* or identif*) near6 (monitoring or tracking) near5 server* Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	2014-11-10
10	266 hits	Any Classification 707802 or 709229 or 726004 or G06F001730 pattern* near4 recogni* near6 engine* Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	2014-11-10
9	65 hits	Any Classification 709 ((monitoring or track*) near5 agent*) same (assign* near6 server*)	2014-11-10

		Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	
8	696 hits	Any Classification 709 (monitoring or track*) near5 agent* near5 server* Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	2014-11-10
7	228 hits	Combined query 5 not (2 or 3 or 4)	2014-11-10
6	18474 hits	Combined query 4 not (2 or 3)	2014-11-10
5	270 hits	((multiple or many or plural* or numerous) near4 (user* or tenant* or tenancy) near6 (application* or program* or service*)) same ((enabl* or implement*) near5 (single or solo or singular)) and ((tag*4 or associat*) near6 (user* or tenant*)) Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	2014-11-10
4	18759 hits	Claims, Title or Abstract (multiple or many or plural* or numerous) and (user* or tenant* or tenancy) and (application* or program* or service*) and (enabl* or implement*) and (single or solo or singular) and (tag*4 or associat*) Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	2014-11-10
3	285 hits	Title or Abstract (multiple or many or plural* or numerous) and (user* or tenant* or tenancy) and (application* or program* or service*) and (enabl* or implement*) and (single or solo or singular) and (tag*4 or associat*) Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	2014-11-10
2	67 hits	Inventor(s) JONES, Bradley W	2014-11-10

		Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	
1	8 hits	Assignee/Applicant PUREPREDICTIVE INC Databases USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA Years 1836-2014	2014-11-10

Non-Patent Literature (NPL) Search Strategy/Results:

ProQuest

11 November 2014

ti((multiple OR many OR plural) (user OR tenant) program enable (single OR solo OR individual))

ab((multiple OR many OR plural) (user OR tenant) program enable (single OR solo OR individual))

(multiple OR many OR plural) NEAR/4 (user OR tenant) NEAR/5 program NEAR/10 (enable OR implement OR allow) NEAR/8 (single OR solo OR individual)

IP.com

11 November 2014

Multi-user application enabling a single-user computer program

multi-tenant enabling a single-tenant computer program

tag data associated with multiple tenants

Google

11 November 2014

multi-tenant enabling a single-tenant computer program

multi-tenant architecture serving multiple users

single-tenant computer program product to be executed as a service

Electronic Acknowledgement Receipt

EFS ID:	21971310
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	03-APR-2015
Filing Date:	29-MAY-2013
Time Stamp:	23:54:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS11coversheet.pdf	48422 e57aa6a68781860f88438f9fff1670e4e180ce55	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS11.pdf	613942 1efef7b70dcb1c90d0d7ddd8396464bbf2584006	no	8
Warnings:					
Information:					
3	Non Patent Literature	3128_2_2_OfficeAction_04_02_15.pdf	1593236 38e53cc90446e25503091fef49b6962422ea0b39	no	16
Warnings:					
Information:					
4	Non Patent Literature	3128_2_3_OfficeAction_12_22_14.pdf	1727101 0dcb23577410b0d2ec33b324f7f09b55cab5c14d	no	18
Warnings:					
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5	Non Patent Literature	3128_2_12PCT_ISR.pdf	2403202 2441c635352f5f2f4af7784ef5ed68195591dd2b	no	16
Warnings:					
Information:					
6	Non Patent Literature	ComputationalGrids.pdf	8441295 689a6a3a1b4ef54c8c138d53aade0a787ee2a143	no	130
Warnings:					
Information:					
7	Non Patent Literature	HP_ProcessResource.pdf	9051109 951c3ea275dac4eaee8d455ea0abd1dfa338ebfd	no	310
Warnings:					
Information:					
8	Non Patent Literature	IntelligentMiner.pdf	4941338 0a58cf8f1d411f926eb36cfbc271b82b2861ca97	no	15
Warnings:					
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		Total Files Size (in bytes):	28819645		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by either submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 to on April 3, 2015.

/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2129 Examiner: Daywayshwar D. Misir

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

___ under 37 CFR 1.97(d) together with a:
____ Statement under 37 CFR 1.97(e), and
____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

_____ under 37 CFR 1.97(e),

_____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: April 3, 2015
50 West Broadway, 10th Floor
Salt Lake City, UT 84101
Telephone (801) 994-4646
Fax (801) 531-1929

UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/904,963	05/29/2013	Kelly D. Phillipps	3128.2.5

CONFIRMATION NO. 6149

36491
Kunzler Law Group
50 W. Broadway
10th Floor
SALT LAKE CITY, UT 84101

PUBLICATION NOTICE

OC000000072193528

Title:USER INTERFACE FOR MACHINE LEARNING

Publication No.US-2014-0358825-A1
Publication Date:12/04/2014

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13904963
Filing Date	2013-05-29
First Named Inventor	Kelly D. Phillipps
Art Unit	2122
Examiner Name	Kakali Chaki
Attorney Docket Number	3128.2.5

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8260117		2012-09-04	Xu, et al.	
	2	5963910		1999-10-05	Ulwick	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050090911		2005-04-28	Ingargiola, et al.	
	2	20090222742		2009-09-03	Pelton, et al.	
	3	20030069869		2003-04-10	Gronau, et al.	
	4	20130066886		2013-03-14	Bagchi, et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

	5	20080313110		2008-12-18	Kreamer, et al.	
	6	20120330971		2012-12-27	Thomas, et al.	
	7	20100145902		2010-06-10	Boyan, et al.	
	8	20050278362		2005-12-15	Maren, et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. PCT/US14/39859, 3128.2.5PCT, International Search Report and Written Opinion, October 16, 2014	☐
	2	Application No. PCT/US14/39861, 3128.2.7PCT, International Search Report and Written Opinion, October 16, 2014	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

	3	Application No. PCT/US14/42754, 3128.2.8PCT, International Search Report and Written Opinion, October 15, 2014	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-11-20
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
8 EAST BROADWAY, SUITE 600
SALT LAKE CITY, UT 84111

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 16 OCT 2014
Applicant's or agent's file reference 3128-2-5PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 14/39859	International filing date *(day/month/year)* 28 May 2014 (28.05.2014)
Applicant PUREPREDICTIVE, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau of WIPO preferably through ePCT or on paper to, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **19 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Lee W. Young Telephone No. PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2014)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 3128-2-5PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 14/39859	International filing date *(day/month/year)* 28 May 2014 (28.05.2014)	(Earliest) Priority Date *(day/month/year)* 29 May 2013 (29.05.2013)
Applicant PUREPREDICTIVE, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1A

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 14/39859

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 3/048 (2014.01)
CPC - G06F 3/0481
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8): G06F 3/048 (2014.01)
CPC: G06F 3/0481

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC(8): G06F 3/048 (2014.01); USPC: 706/12; 715/961; 715/764; CPC: G06F 3/0481; G06F 9/4443; G06F 3/0482; G06Q 10/10; G06F 3/04847 (keyword limited; terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase; Google(Web); Search terms used: user interface machine learning parameter visualize modify display range variable predict slider chart result frequency increment metric factor effect affect collaboration adjust set conference

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2005/0090911 A1 (Ingargiola et al.) 28 April 2005 (28.04.2005), entire document especially abstract; Fig. 21A to 22B; para [0012], [0013], [0043]-[0055], [0094], [0097], [0111], [0119], [0182], [0186], [0193], [0195]	1-14, 17-22 --- 15, 16, 23-26
Y	US 8,260,117 B1 (Xu et al.) 04 September 2012 (04.09.2012), col. 2, ln. 45-65; col. 3, ln. 30-45	15, 16, 23-25
Y	US 2009/0222742 A1 (Pelton et al.) 03 September 2009 (03.09.2009), para [0031], [0037], [0046], [0112]	25, 26

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
09 September 2014 (09.09.2014)	16 OCT 2014
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
8 EAST BROADWAY, SUITE 600
SALT LAKE CITY, UT 84111

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	16 OCT 2014
Applicant's or agent's file reference 3128-2-5PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 14/39859	28 May 2014 (28.05.2014)	29 May 2013 (29.05.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 3/048 (2014.01)
CPC - G06F 3/0481

Applicant PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	09 September 2014 (09.09.2014)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/39859

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/39859

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	15, 16, 23-26	YES
	Claims	1-14, 17-22	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-26	NO
Industrial applicability (IA)	Claims	1-26	YES
	Claims	NONE	NO

2. Citations and explanations:

Claims 1-14 and 17-22 lack novelty under PCT Article 33(2) as being anticipated by US 2005/0090911 A1 to Ingargiola et al. (hereinafter 'Ingargiola').

Regarding claim 1, Ingargiola teaches an apparatus for machine learning results (visualizing machine learning results; abstract; Fig. 21A to 22B; para [0012]), the apparatus comprising: an input module configured to receive user input identifying one or more values for one or more machine learning parameters (user specified inputs / indicators used in a learning / modeling processes; para [0012], [0013], [0053]-[0055], [0094]); a display module configured to display one or more machine learning results for the one or more identified machine learning parameters, the one or more machine learning results determined using machine learning (GUI provides / outputs of machine learning produced predictions and recommendations based on the specified parameters; abstract; para [0013], [0046], [0047], [0097], [0193], [0195]); and an update module configured to dynamically update the displayed one or more machine learning results in response to the input module receiving additional user input identifying one or more additional values for the one or more machine learning parameters (re-specifying and tuning parameters to modify the results; para [0085], [0111], [0119], [0182], [0186]).

Regarding claim 2, Ingargiola teaches a pre-compute module configured to predetermine, using the machine learning, permutations of the machine learning results at predefined increments between a minimum value for the one or more machine learning parameters and a maximum value for the one or more machine learning parameters, prior to the input module receiving the user input (output dynamic results in response to a variety of pre-processing default, pre-learned and pre-stored library ranges / spectrum of parameter values and sampling frequencies; Fig. 8; para [0047], [0051], [0055], [0103], [0104]).

Regarding claim 3, Ingargiola teaches the pre-compute module is configured to cache the predetermined permutations of the machine learning results for the update module in a results data structure indexed by the one or more machine learning parameters (pre-processing the library / cache of output producing input variables / indicators using an organized folder / structure; Fig. 3, 5; para [0094], [0095], [0177]).

Regarding claim 4, Ingargiola teaches the pre-compute module is configured to determine the machine learning results by looking up the machine learning results in the results data structure using the one or more machine learning parameters (reference / import the library of pre-processed results using one of the organization or class parameters, e.g., using a name; Fig. 3, 5; para [0094], [0121]).

Regarding claim 5, Ingargiola teaches the display module is configured to display one or more attributes of a data set used by the machine learning to determine the one or more machine learning results and one or more impact metrics for each displayed attribute (display the set of data features and factors / indicators used to influence / affect the corresponding result metrics; Fig. 1, 3, 5; para [0013], [0090], [0108], [0193]).

Regarding claim 6, Ingargiola teaches a predictive compiler module configured to generate the machine learning, the machine learning comprising program code for a plurality of learned functions from multiple machine learning classes (para [0047], [0049], [0060], [0092]), the program code generated by the predictive compiler module to predict the machine learning results based on the one or more machine learning parameters (para [0049], [0181]).

Regarding claim 7, Ingargiola teaches a recommendation module configured to select a suggested set of machine learning results, the display module configured to display the suggested set of machine learning results to the user prior to the input module receiving the user input (results / recommendations based on default / prior inputs; para [0047], [0051], [0119], [0199]).

--CONTINUED IN SUPPLEMENTAL BOX--

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/39859

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box No. V. 2. Citations and explanations:

Regarding claim 8, Ingargiola teaches the one or more machine learning parameters comprise one or more of an input and an output of the machine learning adjusted by the user input and the machine learning results comprise one or more of an input and an output of the machine learning determined based on the adjusted one or more machine learning parameters (re-specifying and tuning parameters to modify the results; para [0085], [0111], [0119], [0182], [0186]).

Regarding claim 9, Ingargiola teaches the one or more machine learning parameters comprise one or more of an attribute of a feature (para [0175]), a target value for a goal (objectives for target instruments; para [0085], [0089]), an action relating to a goal (objectives and strategies; para [0085], [0092]), a confidence metric (para [0163], [0198]-[0201]), and a target of an action (para [0085], [0089]).

Regarding claim 10, Ingargiola teaches the machine learning results comprise one or more of an attribute of a feature (para [0175]), a target value for a goal (objectives for target instruments; para [0085], [0089]), an action relating to a goal (objectives and strategies; para [0085], [0092]), a confidence metric (para [0163], [0198]-[0201]), and a target of an action (para [0085], [0089]).

Regarding claim 11, Ingargiola teaches the input module is configured to receive the user input as an adjustment to a slider graphical user interface element corresponding to the one or more machine learning parameters (drag and drop slider input parameters; para [0083], [0202]).

Regarding claim 12, Ingargiola teaches the input module is configured to receive the user input as a user entry in a graphical table and the display module is configured to display the one or more machine learning results as entries in the graphical table (Fig. 8, 10, 21A to 22B; para [0110], [0198], [0201]).

Regarding claim 13, Ingargiola teaches the input module is configured to receive the user input as a user manipulation of a displayed object (drag and drop slider input parameters; para [0083], [0202]).

Regarding claim 14, Ingargiola teaches the user input comprises one or more of: an adjustment to a size of the displayed object (para [0083], [0088], [0202]); an adjustment to a vertical position of the displayed object (drag and drop slider input parameters; para [0083], [0202]); an adjustment to a horizontal position of the displayed object (drag and drop slider input parameters; para [0083], [0202]); an adjustment to an opacity of the displayed object; an adjustment to a color of the displayed object; an adjustment to a shape of the displayed object; an adjustment to shading of the displayed object; a text entry in a text box for the displayed object (para [0202]); and user interaction with an animation for the displayed object (drag and drop slider input parameters; para [0083], [0088], [0202]).

Regarding claim 17, Ingargiola teaches a method for machine learning results, the method comprising: inputting permutations of machine learning parameters incrementally between minimum values for the machine learning parameters and maximum values for the machine learning parameters into a predictive program (output dynamic results in response to a variety of pre-processing default, pre-learned and pre-stored library ranges / spectrum of parameter values and sampling frequencies; Fig. 8; para [0047], [0051], [0055], [0103], [0104]); determining machine learning results from the predictive program for the input permutations of the machine learning parameters (abstract; para [0012], [0047], [0093]); and populating a results data structure with the determined machine learning results indexed by the machine learning parameters (abstract; Fig. 21A to 22B; para [0137], [0192], [0201]).

Regarding claim 18, Ingargiola teaches the results data structure is populated prior to receiving user input identifying a value for a machine learning parameter (results / recommendations based on default / prior inputs; para [0047], [0051], [0119], [0199]).

Regarding claim 19, Ingargiola teaches dynamically displaying one or more corresponding machine learning parameters and machine learning results from the results data structure in response to user input selecting a value for one or more of a machine learning parameter and a machine learning result (re-specifying and tuning parameters to modify the results; para [0085], [0111], [0119], [0182], [0186]).

Regarding claim 20, Ingargiola teaches dynamically changing the displayed one or more corresponding machine learning parameters and machine learning results using the results data structure in response to user input adjusting a value for a machine learning parameter (re-specifying and tuning parameters to modify the results; para [0085], [0111], [0119], [0182], [0186]).

Regarding claim 21, Ingargiola teaches dynamically changing the displayed one or more corresponding machine learning parameters and machine learning results using the results data structure in response to user input adjusting a value for a machine learning result (abstract; Fig. 21A to 22B; para [0085], [0111], [0119], [0137], [0182], [0186], [0192], [0201]).

Regarding claim 22, Ingargiola teaches system for machine learning results (visualizing machine learning results; abstract; Fig. 21A to 22B; para [0012]), the system comprising: a pre-compute module configured to predetermine, using one or more predictive programs, permutations of machine learning results for each of the one or more predictive programs at predefined increments between minimum values for machine learning parameters and maximum values for the machine learning parameters (output dynamic results in response to a variety of pre-processing default, pre-learned and pre-stored library ranges / spectrum of parameter values and sampling frequencies; Fig. 8; para [0047], [0051], [0055], [0103], [0104]); an input module configured to receive user input from multiple users identifying values for one or more of the machine learning parameters for the one or more predictive programs (user input data from a user's company / peers; para [0056], [0073], [0163]); and a display module configured to display one or more of the predetermined machine learning results to the multiple users based on the identified values (Fig. 26; para [0056], [0073], [0163]).

--CONTINUED IN NEXT SUPPLEMENTAL BOX--

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/39859

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box No. V. 2. Citations and explanations:

Claims 15, 16, 23 and 24 lack an inventive step under PCT Article 33(3) as being obvious over Ingargiola in view of US 8,260,117 B1 to Xu et al. (hereinafter 'Xu').

Regarding claim 15, Ingargiola teaches configured to determine an impact on the one or more machine learning results based on different user input received from a different user (user input data from a user's company / peers or a population of participants; Fig. 26; para [0056], [0073], [0145], [0163]), but fails to disclose a collaboration module. Xu teaches a collaboration module (to provide collaborative input parameters for machine learning to provide recommendations that satisfy a particular goal; col 2 ln 45-65; col 3 ln 30-45). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the apparatus of Ingargiola to include a collaboration module as taught by Xu for the advantage of providing more desirable inputs and recommendations.

Regarding claim 16, Xu teaches the input module is configured to receive the different user input from the different user, the different user input identifying a different value for a different machine learning parameter (col 2 ln 45-65; col 3 ln 30-45), and Ingargiola further teaches the display module configured to display multiple sets of one or more machine learning results to multiple users (user input data from a user's company / peers / participants; Fig. 26; para [0056], [0073], [0145], [0163]), and the update module configured to dynamically update the displayed multiple sets of one or more machine learning results (Fig. 21A to 22B; para [0050], [0084], [0125], [0168], [0202]).

Regarding claim 23, Ingargiola teaches configured to determine an impact on machine learning results from one of the predictive programs based on an identified value for a machine learning parameter for another of the predictive programs (reuse predictive learning program advisors from a population of participants for influencing predictions / recommendations; para [0060], [0145], [0151], [0168], [0192]), but fails to disclose a collaboration module. Xu teaches a collaboration module (to provide collaborative input parameters for machine learning to provide recommendations that satisfy a particular goal; col 2 ln 45-65; col 3 ln 30-45). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Ingargiola to include a collaboration module as taught by Xu for the advantage of providing more desirable inputs and recommendations.

Regarding claim 24, Xu teaches the multiple users identify the values for different predictive programs of the predictive programs (col 2 ln 45-65; col 3 ln 30-45).

Claim 26 lacks an inventive step under PCT Article 33(3) as being obvious over Ingargiola in view of US 2009/0222742 A1 to Pelton et al. (hereinafter 'Pelton').

Regarding claim 26, Ingargiola teaches the input module is configured to receive the user input from one or more of: separate client devices for the multiple users over a data network (Fig. 26; para [0070]-[0076]), but fails to disclose a shared interface for the multiple users on a single device. Pelton teaches a shared interface for the multiple users on a single device (a server interface to provide a proactive / real-time collaboration workspaces using machine learning; para [0031], [0037], [0046], [0112]).

Claim 25 lack an inventive step under PCT Article 33(3) as being obvious over Ingargiola in view of Xu and further in view of Pelton.

Regarding claim 25, Xu teaches the display module is configured to display the impact on the machine learning results for the multiple users (user input data from a user's company / peers or a population of participants; Fig. 26; para [0056], [0073], [0145], [0163]) and Ingargiola further teaches to display the machine learning results for the different predictive programs on different displays for the multiple users (Fig. 26; para [0056], [0073], [0145], [0163]), but fails to disclose on a shared display. Pelton teaches on a shared display (to provide a proactive / real-time collaboration workspaces using machine learning; para [0031], [0037], [0046]). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the system of Ingargiola in view of Xu to include on a shared display as taught by Pelton for the advantage of providing enhanced participation.

Claims 1-26 have industrial applicability as defined by PCT Article 33(4), because the subject matter can be made or used in industry.

SEARCH HISTORY

Application Number	PCT/US 14/39859
Search Conducted By	CHJ
Search Approved By	PCL

US/IPC Classifications Searched	IPC(8): G06F 3/048 (2014.01) CPC: G06F 3/0481
Date Conducted	09 September 2014 (09.09.2014)

Documentation Searched	IPC(8): G06F 3/048 (2014.01); USPC: 706/12; 715/961; 715/764; CPC: G06F 3/0481; G06F 9/4443; G06F 3/0482; G06Q 10/10; G06F 3/04847 (keyword limited; terms below)
Search Terms Used	user interface machine learning parameter visualize modify display range variable predict slider chart result frequency increment metric factor effect affect collaboration adjust set conference
Date Conducted	09 September 2014 (09.09.2014)

Electronic Database Searched	PatBase
Files Searched	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
Date Conducted	09 September 2014 (09.09.2014)
Search Logic:	
1) ic=(G06F3/048) or uc=(706/12 or 715/961 or 715/764) or cpc=(G06F3/0481 or G06F9/4443 or G06F3/0482 or G06Q10/10 or G06F3/04847) (100000)	

2) 1 and (GUI or user interface) w6 machine learning (24)
3) 1 and (predict*) w6 machine learning (198)
4) 3 and (parameter% or variable%) (160)
5) 4 and (modif* or adjust* or slider) w6 (user% or input% or factor%) (53)
6) 4 not 5 (107)
7) 3 not 6 (91)
8) (modif* or adjust* or slider) w6 (user% or input% or factor%) (100000)
9) (parameter% or affect* or influenc* or impact* or adjust*) w8 (predict* or machine learn*) (48002)
10) machine learning (15338)
11) 8 and 9 (8576)
12) 11 and 10 (726)
13) 11 and chart% (3306)
14) 13 and (display* or visualiz* or screen%) (2695)
15) 12 and 13 (380)
16) 15 and 14 (357)
17) (frequency or sampl* or increment* or interval or range) w6 (indicat* or variable% or parameter% or value%) (100000)
18) 16 and 17 (270)
19) 18 not 3 (259)
20) 19 and (conferenc* or collaborat*) (113)

Electronic Database Searched	Google
Files Searched	Web
Date Conducted	09 September 2014 (09.09.2014)
Search Logic:	

"user interface" "machine learning" "user input" parameter visualize modify display "range" variable "prediction" "slider" chart result frequency increment "metrics" factor effect affect collaboration adjust set conference 86

"user interface" "machine learning" "user input" parameter visualize modify display "range" variable "prediction" "slider" chart result frequency increment "metrics" factor effect affect adjust set 94

"user interface" "machine learning" "user input" parameter "visualize" modify display "range" variable "prediction" "slider" chart result frequency increment "metrics" factor effect affect adjust set 87

Supplemental Search:

Electronic Database Searched	PatBase
Files Searched	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB

	IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
Date Conducted	16 September 2014

Search Logic:

Search 1: (machine learning) (Results 15444)
Search 2: 1 and display* w3 result* (Results 1709)
Search 3: 2 and diaply w3 module (Results 0)
Search 3: 2 and display w3 module (Results 119)
Search 4: 3 and permutation* (Results 15)
Search 5: 1 and dynamic w3 (user interface) (Results 50)
Search 6: 5 and chang* w3 parameter* (Results 5)

Electronic Database Searched	Google
Files Searched	Web, Scholar with patents
Date Conducted	15 September 2014

Search Logic:

Scholar:
dynamic user interface for machine learning results About 288,000 results (0.13 sec)
dynamic user interface for machine learning results having changeable parameters About 17,100 results (0.15 sec)
dynamic user interface for machine learning results having changeable parameters for additional data input About 16,000 results (0.15 sec)

Web:
dynamic user interface for machine learning results About 4,000,000 results
dynamic user interface for machine learning results having changeable parameters About 4,520,000 results
dynamic user interface for machine learning results having changeable parameters for additional data input About 5,620,000 results

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
8 EAST BROADWAY, SUITE 600
SALT LAKE CITY, UT 84111

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 16 OCT 2014
Applicant's or agent's file reference 3128-2-7PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 14/39861	International filing date *(day/month/year)* 28 May 2014 (28.05.2014)
Applicant PUREPREDICTIVE, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau of WIPO preferably through ePCT or on paper to, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **19 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Lee W. Young PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2014)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 3128-2-7PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 14/39861	International filing date *(day/month/year)* 28 May 2014 (28.05.2014)	(Earliest) Priority Date *(day/month/year)* 29 May 2013 (29.05.2013)
Applicant PUREPREDICTIVE, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1C

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 14/39861

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/18 (2014.01)
CPC - G06N 99/005
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC: 706/919; CPC: G06N 99/005; IPC(8): G06F 15/18 (2014.01)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC(8): G06F 15/18 (2014.01); CPC: G06K9/6256, G06K9/6269, G06N5/025, G06N7/00; USPC: 706/12, 706/919

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase, Google, Google Scholar
terms: Business Plan, Action Plan, Machine Learning, Recommendation, Prediction, Confidence, Iterative, Outcome, Inputs

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2003/0069869 A1 (Gronau et al.) 10 April 2003 (10.04.2003), entire document especially Para [0052]-[0056], [0068]-[0071].	1-8, 17-19, 21 --- 9-16, 20, 22
Y	US 2013/0066886 A1 (Bagchi et al.) 14 March 2013 (14.03.2013), entire document especially Para [0041]-[0044], [0046]-[0047].	9-12, 15, 16
Y	US 5,963,910 A (Ulwick) 05 October 1999 (05.10.1999), entire document especially Col 6, ln 42 -65.	13, 14, 20, 22
A	US 2008/0313110 A1 (Kreamer et al.) 18 December 2008 (18.12.2008), entire document.	1-22

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
08 September 2014 (08.09.2014)	16 OCT 2014
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
8 EAST BROADWAY, SUITE 600
SALT LAKE CITY, UT 84111

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	16 OCT 2014
Applicant's or agent's file reference 3128-2-7PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 14/39861	28 May 2014 (28.05.2014)	29 May 2013 (29.05.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/18 (2014.01)
CPC - G06N 99/005

Applicant PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	08 September 2014 (08.09.2014)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/39861

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

   ☐ on paper

   ☐ in electronic form

   b. (time)

   ☐ in the international application as filed

   ☐ together with the international application in electronic form

   ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/39861

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	9-16, 20, 22	YES
	Claims	1-8, 17-19, 21	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-22	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims	NONE	NO

2. Citations and explanations:

Claims 1-8, 17-19, 21 lack novelty under PCT Article 33(2) as being anticipated by US 2003/0069869 A1 (Gronau et al.).

As to Claim 1, Gronau teaches a method for an action plan (Abstract, Para [0052], [0053]), the method comprising: processing different instances of data using machine learning to produce one or more results (Para [0052], [0053], [0068]), the different instances of data comprising different values for one or more actionable features (Para [0068]); selecting one or more recommended actions based on the one or more results (Para [0070], [0071]); and providing an action plan associated with the one or more recommended actions (Para [0070], [0071]).

As to Claim 2, Gronau teaches the method of claim 1 wherein the one or more recommended actions are selected for achieving a goal associated with the machine learning (Para [0052], [0053], [0069], [0070]).

As to Claim 3, Gronau teaches the method of claim 1, wherein the one or more recommended actions are selected based on one or more of a confidence metric associated with the one or more results and a predicted outcome associated with the one or more recommended actions (Para [0054]-[0056]).

As to Claim 4, Gronau teaches the method of claim 1, further comprising varying values of one or more non-actionable features for the different instances of data (Para [0068]).

As to Claim 5, Gronau teaches the method of claim 4, wherein the one or more recommended actions include a recommendation for data collection associated with the one or more non-actionable features (Para [0053]).

As to Claim 6, Gronau teaches the method of claim 1, further comprising storing the one or more results in a results data structure indexed by one or more of the one or more actionable features and the different instances of data (Para [0071]).

As to Claim 7, Gronau teaches the method of claim 6, further comprising dynamically updating the provided action plan based on the stored one or more results in response to user input changing one or more machine learning parameters associated with the action plan (Para [0071]).

As to Claim 8, Gronau teaches the method of claim 7, wherein the one or more machine learning parameters comprise one or more of: a value for an actionable feature; a recommended action; a target for a recommended action; a count for a recommended action; an action time for a recommended action; a cost for a recommended action; and a predicted outcome for a recommended action (Para-[0071], [0072]).

As to Claim 17, Gronau teaches an apparatus for an action plan (Para [0052], [0053]), the apparatus comprising: a machine learning module configured to process different instances of data using machine learning to produce one or more results (Para [0052], [0053], [0068]), the different instances of data comprising different values for one or more features (Para [0068]), the one or more results comprising at least one of a confidence metric and a predicted outcome (Para [0054]-[0056]); a recommended action module configured to select one or more recommended actions for achieving a goal associated with the machine learning (Para [0052], [0053], [0069], [0070]), the recommended action module selecting the one or more recommended actions based on the one or more results; and an action plan interface module configured to provide an action plan associated with the one or more recommended actions (Para [0053]).

As to Claim 18, Gronau teaches the apparatus of claim 17, further comprising a pre-compute module configured to store the one or more results in a results data structure indexed by the one or more features and the different instances of data (Para [0071]).

As to Claim 19, Gronau teaches the apparatus of claim 18, further comprising an update module configured to dynamically update the provided action plan based on the stored one or more results in response to user input changing one or more machine learning parameters associated with the action plan (Para [0071]).

---(Please See Supplemental Box)---

Form PCT/ISA/237 (Box No. V) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/39861

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box V. 2 Citations and Explanations

As to Claim 21, Gronau teaches an apparatus for an action plan (Para [0052], [0053]), the apparatus comprising: means for processing different instances of data using machine learning to produce one or more results (Para [0052], [0053], [0068]), the different instances of data comprising different values for one or more features (Para [0068]); means for selecting one or more recommended actions based on the one or more results; and means for providing an action plan comprising the one or more recommended actions and one or more target subjects for the one or more recommended actions (Para [0052], [0053], [0069], [0070]).

Claims 9-12, 15, 16 lack an inventive step under PCT Article 33(3) as being obvious over Gronau in view of US 2013/0066886 A1 (Bagchi et al.).

As to Claim 9, Gronau teaches the method of claim 1, but does not teach wherein the action plan comprises one or more lists of target subjects for the one or more recommended actions, the target subjects in the one or more lists ordered by confidence metrics generated by the machine learning for the target subjects. However, Bagchi teaches wherein the action plan comprises one or more lists of target subjects for the one or more recommended actions, the target subjects in the one or more lists ordered by confidence metrics generated by the machine learning for the target subjects (Para [0041]-[0043]). It would have been obvious to one of ordinary skill in the art to apply Bagchi's list of target subjects to Gronau's action plan in order to provide the ability to quickly identify, in a real-time setting, the relevant information from amongst the potentially huge amounts of unstructured information available.

As to Claim 10, Gronau teaches the method of claim 1, but does not teach wherein processing the different instances comprises predetermining, using the machine learning, permutations of the one or more results at predefined increments between one or more minimum values for the one or more actionable features and one or more maximum values for the one or more actionable features. However, Bagchi discloses processing the different instances comprises predetermining, using the machine learning, permutations of the one or more results at predefined increments between one or more minimum values for the one or more actionable features and one or more maximum values for the one or more actionable features(Para [0041]-[0044]. It would have been obvious to one of ordinary skill in the art to apply Bagchi's actionable features to Gronau's action plan in order to allow the operators to more fully understand and evaluate the events to make their own judgments as to relevance to and impact upon the actions of the action plan.

As to Claim 11, Gronau teaches the method of claim 1, but does not teach further comprising increasing one or more of a range of and a frequency of the different values for the one or more actionable features until the one or more results satisfy a predefined threshold. However, Bagchi teaches increasing one or more of a range of and a frequency of the different values for the one or more actionable features until the one or more results satisfy a predefined threshold (Para [0047]). It would have been obvious to one of ordinary skill in the art to apply Bagchi's actionable features to Gronau's action plan in order to allow the operators to more fully understand and evaluate the events to make their own judgments as to relevance to and impact upon the actions of the action plan

As to Claim 12, Bagchi further wherein the one or more results satisfy the predefined threshold in response to determining a predictable relationship between at least one set of adjacent results (Para [0046]-[0047]).

As to Claim 15, Gronau teaches the method of claim 1 but does not teach further comprising fitting the one or more recommended actions to an action function, the action plan comprising the action function. However, Bagchi teaches fitting the one or more recommended actions to an action function, the action plan comprising the action function (Para [0036]-[0038]). It would have been obvious to one of ordinary skill in the art to apply Bagchi's action function to Gronau's action plan in order to provide the ability to quickly identify, in a real-time setting, the relevant information from amongst the potentially huge amounts of unstructured information available.

As to Claim 16, Bagchi further teaches wherein the action function interpolates recommended actions between the one or more recommended actions (Para [0036]-[0038]).

Claims 13, 14, 20, 22 lack an inventive step under PCT Article 33(3) as being obvious over Gronau in view of US 5,963,910 A1 (Ulwick).

As to Claim 13, Gronau teaches the method of claim 1, but does not teach further comprising generating the machine learning, the machine learning comprising program code for a plurality of learned functions from multiple machine learning classes, the program code generated to predict the one or more results based on the different instances of data. However Ulwick teaches generating the machine learning, the machine learning comprising program code for a plurality of learned functions from multiple machine learning classes, the program code generated to predict the one or more results based on the different instances of data (Col 6, ln 42-65). It would have been obvious to one of ordinary skill in the art to apply Ulwick's program code to Gronau's action plan in order to quickly provide products and analysis for different users, markets or industries.

As to Claim 14, Gronau teaches the method of claim 13, but does not teach wherein the machine learning comprises a different predictive program for each different recommended action, the different instances of data processed based on one or more dependent relationships between the different predictive programs. However Ulwick teaches wherein the machine learning comprises a different predictive program for each different recommended action, the different instances of data processed based on one or more dependent relationships between the different predictive programs (Col 6, ln 42-65). It would have been obvious to one of ordinary skill in the art to apply Ulwick's different program code to Gronau's action plan in order to quickly provide products and analysis for different users, markets or industries.

---(Please See Supplemental Box)---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/39861

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box V. 2 Citations and Explanations

As to Claim 20, Gronau teaches the apparatus of claim 17, but does not teach further comprising a predictive compiler module configured to generate the machine learning, the machine learning comprising program code for a plurality of learned functions from multiple machine learning classes, the program code generated to predict the one or more results based on the different instances of data. However, Ulwick teaches further comprising a predictive compiler module configured to generate the machine learning, the machine learning comprising program code for a plurality of learned functions from multiple machine learning classes, the program code generated to predict the one or more results based on the different instances of data (Col 6, ln 42-65). It would have been obvious to one of ordinary skill in the art to apply Ulwick's different program code to Gronau's action plan in order to quickly provide products and analysis for different users, markets or industries.

As to Claim 22, Gronau teaches the apparatus of claim 21, but does not teach further comprising means for generating the machine learning, the machine learning comprising program code for a plurality of learned functions from multiple machine learning classes, the program code generated to predict the one or more results based on the different instances of data. However, Ulwick teaches means for generating the machine learning, the machine learning comprising program code for a plurality of learned functions from multiple machine learning classes, the program code generated to predict the one or more results based on the different instances of data (Col 6, ln 42-65). It would have been obvious to one of ordinary skill in the art to apply Ulwick's different program code to Gronau's action plan in order to quickly provide products and analysis for different users, markets or industries.

Claims 1-22 have industrial applicability as defined by PCT Article 33(4), because the subject matter can be made or used in industry.

SEARCH HISTORY

Application Number	PCT/US 14/39861
Search Conducted By	KB
Search Approved By	PCL

US/IPC Classifications Searched	USPC: 706/919; CPC: G06N 99/005; IPC(8): G06F 15/18 (2014.01)
Date Conducted	08 September 2014 (08.09.2014)

Documentation Searched	IPC(8): G06F 15/18 (2014.01); CPC: G06K9/6256, G06K9/6269, G06N5/025, G06N7/00; USPC: 706/12, 706/919
Search Terms Used	Business Plan, Action Plan, Machine Learning, Recommendation, Prediction, Confidence, Iterative, Outcome, Inputs
Date Conducted	08 September 2014 (08.09.2014)

Electronic Database Searched	Patbase
Files Searched	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ 0D DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
Date Conducted	08 September 2014 (08.09.2014)

Search Logic:

Search 1: CPC=(G06K9/6256 or G06K9/6269 or G06N5/025 or G06N7/005) (Results 1403)
Search 2: UC=(706/12 or 706/919) (Results 3030)
Search 3: IC=(G06F15/18) (Results 11742)
Search 4: 1 or 2 or 3 (Results 13431)

Search 5:	4 and (Business or Action) w5 Plan% (Results 172)
Search 6:	5 and (Machine Learning) (Results 40)
Search 7:	6 and (Recommend* or Suggest*) w8 (Action% or Plan%) (Results 6)
Search 8:	4 and ((Recommend* or Suggest*) w8 (Action% or Plan%)) w20 (Pattern% or (Machine Learning) or Iterative or Confidence) (Results 24)
Search 9:	8 and (Confidence) w5 (Metric%) (Results 0)
Search 10:	6 and (Confidence) w5 (Metric%) (Results 0)
Search 11:	4 and (Cognitiv* or Visual) w5 (Model*) (Results 258)
Search 12:	11 and Dynamic* (Results 198)
Search 13:	12 and (Predict*) w6 (Data or Outcome%) (Results 41)
Search 14:	(Machine Learning) (Results 15338)
Search 15:	14 and TAC=((Business or Action) w5 Plan%) (Results 28)
Search 16:	14 and (Business or Action) w5 Plan% (Results 214)
Search 17:	16 and (Recommend* or Suggest*) w8 (Action% or Plan%) (Results 60)
Search 18:	17 and (Confidenc*) (Results 29)
Search 19:	14 and (Outcome%) w10 Predict* (Results 1025)
Search 20:	19 and (Different) w4 (Data or Input%) (Results 479)
Search 21:	20 and TAC=((Recommend* or Suggest*) w8 (Action% or Plan%)) (Results 12)

Electronic Database Searched	Google
Files Searched	Google Scholar: Articles and Patents
Date Conducted	08 September 2014 (08.09.2014)
Search Logic:	
Business Action Plan - About 2,690,000 results (0.10 sec) Business Action Plan "Machine Learning" - About 26,100 results (0.22 sec) Business Action Plan "Machine Learning" Recommendation - About 18,500 results (0.19 sec) Business Action Plan "Machine Learning" Recommendation Confidence - About 9,910 results (0.24 sec) Business "Action Plan" "Machine Learning" Recommendation Confidence - About 321 results (0.17 sec)	

Supplemental Search:

Electronic Database Searched	Patbase
Files Searched	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ 0D DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
Date Conducted	15 September 2014

Search Logic:

Search 1: (machine learning) w3 plan* (Results 19)
Search 2: (machine learning) and plan* (Results 6028)
Search 3: 2 and action w4 plan* (Results 130)
Search 4: 3 and recommend* (Results 60)
Search 5: 4 and goal (Results 37)
Search 6: 5 and subject (Results 28)
Search 7: 6 and confidence (Results 12)

Electronic Database Searched	Google
Files Searched	Google Scholar: Articles and Patents
Date Conducted	15 September 2014

Search Logic:

Scholar:
machine learning system for action planning and recommendations About 134,000 results (0.13 sec)
machine learning system for action planning and recommendations for goals About 108,000 results (0.18 sec)
machine learning system for action planning and recommendations for goals with confidence value About 63,600 results (0.14 sec)

Web:
machine learning system for action planning and recommendations About 9,920,000 results
machine learning system for action planning and recommendations for goals About 8,250,000 results
machine learning system for action planning and recommendations for goals with confidence value About 4,650,000 results

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: Scott C. Hilton
8 East Broadway
Suite 600
Salt Lake City, Utah 84111
United States of America

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 15 OCT 2014
Applicant's or agent's file reference 3128-2-8PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US14/42754	International filing date *(day/month/year)* 17 June 2014 (17.06.2014)
Applicant PUREPREDICTIVE, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau of WIPO preferably through ePCT or on paper to, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within **19 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Shane Thomas PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2014)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 3128-2-8PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US14/42754	International filing date *(day/month/year)* 17 June 2014 (17.06.2014)	(Earliest) Priority Date *(day/month/year)* 17 June 2013 (17.06.2013)
Applicant PUREPREDICTIVE, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US14/42754

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 17/27; G06N 5/02 (2014.01)
CPC - G06F 17/2785, 17/30713
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) Classification(s): G06F 17/27, 17/28; G06N 5/02; G10L 15/06 (2014.01)
CPC Classification(s): G06F 17/2785, 17/30713; G10L 15/063; G06N 5/025

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C, B, DE-A, DE-T, DE-U, GB-A, FR-A); ProQuest; IEEE/IEEEXplore; Google/Google Scholar; KEYWORDS: extract, load, structure, format, organize, learn, assemble

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012/0330971 A1 (THOMAS, J et al.) 27 December 2012; 1, 7, 8A; Paragraphs [0008], [0021], [0025], [0027], [0029], [0030], [0035], [0047], [0055], [0058], [0060]-[0065], [0112], [0114], [0116], [0119], [0129], [0135], [0140]	1-25
A	US 2010/0145902 A1 (BOYAN, J et al.) 10 June 2010; entire document	1-25
A	US 2005/0278362 A1 (MAREN, A et al.) 15 December 2005; entire document	1-25

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 September 2014 (19.09.2014)	15 OCT 2014
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: Scott C. Hilton
8 East Broadway
Suite 600
Salt Lake City, Utah 84111
United States of America

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	15 OCT 2014
Applicant's or agent's file reference 3128-2-8PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US14/42754	17 June 2014 (17.06.2014)	17 June 2013 (17.06.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 17/27; G06N 5/02 (2014.01)
CPC - G06F 17/2785, 17/30713

Applicant PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [x] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	19 September 2014 (19.09.2014)	Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/42754

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

   ☐ on paper

   ☐ in electronic form

   b. (time)

   ☐ in the international application as filed

   ☐ together with the international application in electronic form

   ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/42754

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	NONE	YES
	Claims	1-25	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-25	NO
Industrial applicability (IA)	Claims	1-25	YES
	Claims	NONE	NO

2. Citations and explanations:

Claims 1-25 lack novelty under PCT Article 33(2) as being anticipated by US 2012/0330971 A1, to THOMAS et al. (hereinafter 'Thomas').

As per claim 1, Thomas discloses an apparatus for performing data analytics using machine learning (a computer system to extract details from receipts to train a language model (data analytics) using machine learning; Paragraphs [0008], [0021]), the apparatus comprising: an extract module configured to extract data from one or more structured data sources (an email crawling module (extract module) retrieves receipts from HTML emails (structured data sources); Figure 1; Paragraphs [0029], [0030]); a load module configured to load the data into an unstructured data set (the feature extraction module 38 (load module) extracts receipt labels into a text blocks of tokens (an unstructured data set); Figure 1; Paragraphs [0025], [0035]); and an unsupervised learning module configured to assemble the unstructured data set into an organized data set using a plurality of unsupervised learning techniques (receipt parsing application 32 (an unsupervised learning module) normalizes text blocks into well-formed structured data (an organized data set) using algorithms such as Hidden Markov Model, HMM, or Conditional Random Field, CRF (unsupervised learning techniques); Paragraphs [0047], [0055], [0135]).

As per claim 2, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, further comprising a supervised learning module configured to generate one or more machine learning ensembles based on the organized data set (evaluation module 64 uses supervised learning to aggregate event counts and indicate accuracy using metric equations (machine learning ensembles) to generate an accuracy report of the normalized tokens (organized data set); Figures 1, 7; Paragraphs [0064], [0065], [0114], [0140]).

As per claim 3, Thomas discloses the apparatus of claim 2. Thomas additionally discloses, wherein the unsupervised learning module is configured to assemble the unstructured data set into multiple versions of the organized data set (normalization sub-module 72 (unsupervised learning module) normalizes token labels (unstructured data set) replacing text blocks from different versions of control receipts with normalized text (organized data set); Figure 1; Paragraphs [0055], [0112], [0129], [0135]), each version of the organized data set using a unique combination of one or more of the plurality of unsupervised learning techniques (refining how features are extracted from additional receipts into normalized text (each version) by adjusting extraction parameters (unique combination) of the multiple algorithms used for training (unsupervised learning techniques); Paragraphs [0055], [0078], [0115], [0116]).

As per claim 4, Thomas discloses the apparatus of claim 3. Thomas additionally discloses, wherein the supervised learning module is configured to generate one or more machine learning ensembles based on each of the multiple versions of the organized data set (evaluation module 64 uses supervised learning to aggregate event counts and indicate accuracy in metric equations (machine learning ensembles) to generate an accuracy report of the different versions; Figures 1, 7; Paragraphs [0064], [0065], [0112], [0114]), and to select one version of the organized data set based on results from the one or more machine learning ensembles (choosing the implementation of feature extraction with the highest scoring receipt (one version of the organized data set) based on the overall quality score F-measure (machine learning ensemble); Paragraph [0065]).

As per claim 5, Thomas discloses the apparatus of claim 2. Thomas additionally discloses, further comprising an update module configured to update the one or more data sources with predicted results generated by the one or more machine learning ensembles (in step 110 of the training method (update module), refines the training data (data sources) by testing the module at 116 and analyzing the evaluation results (machine learning ensembles); Figure 2; Paragraphs [0078], [0116]).

As per claim 6, Thomas discloses the apparatus of claim 2. Thomas additionally discloses, wherein the unsupervised learning module is configured to create training data from the organized data set (receipt parsing application 32 (unsupervised learning module) utilizes receipts from queue 90 to update Itemize Database 82 (create training data); Figure 10; Paragraphs [0133], [0135]), and wherein the supervised learning module is configured to use the training data to generate the one or more machine learning ensembles (evaluation module (supervised learning module) uses newly processed receipt data (training data) to calculate an accuracy score (machine learning ensemble) for each receipt; Paragraphs [0131], [0134]).

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/42754

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

Claims 20 is objected to under PCT Rule 66.2(a)(iii) as containing the following defects in the form or contents thereof: Claim 20, in line 2, recites "one or more machine learning ensemble". For the purposes of this opinion, as best understood, is considered to be a typographical error and will be interpreted as "one or more machine learning ensembles".

Claims 22 is objected to under PCT Rule 66.2(a)(iii) as containing the following defects in the form or contents thereof: Claim 22, in line 6, recites "based on each versions". For the purposes of this opinion, as best understood, is considered to be a typographical error and will be interpreted as "based on each version".

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
-***-Continued from Box V: Citations and Explanations-***-

As per claim 7, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the plurality of unsupervised learning techniques includes clustering data from the unstructured data set using one or more clustering algorithms (analysis by sub-module 60 (unsupervised learning techniques) of features extracted from receipt data (unstructured data set) includes using software for clustering analysis (clustering algorithms); Figure 1; Paragraphs [0048], [0049], [0055]).

As per claim 8, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the plurality of unsupervised learning techniques includes mining metadata from the data in the unstructured data set (analysis by sub-module 60 (unsupervised learning techniques) of features extracted from receipt data (unstructured data set) includes information extraction (mining metadata) and other mining tool operations for text-based data (unstructured data set); Paragraphs [0025], [0048], [0049], [0055]).

As per claim 9, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the plurality of unsupervised learning techniques includes identifying relationships in data of the unstructured data set based on one or more queries submitted for the one or more structured data sources (analysis by sub-module 60 (unsupervised learning techniques) includes mapping text blocks to extracted features (relationships in data) by checking transaction dates (queries) for HTML receipts in the email inbox; Figure 4; Paragraphs [0055], [0069], [0135]).

As per claim 10, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the plurality of unsupervised learning techniques includes identifying relationships in data of the unstructured data set by identifying semantic distances between data in the unstructured data set (analysis by sub-module 60 (unsupervised learning techniques) uses brand name dictionaries in a mapping database (identifying relationships) to identify similar canonical and unique product names using an algorithm (identifying semantic distances) to accurately extract items from receipt data that look like a product or brand name; Paragraphs [0055], [0068], [0139]).

As per claim 11, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the plurality of unsupervised learning techniques includes using statistical data to determine a relationship between data in the unstructured data set (analysis by sub-module 60 (unsupervised learning techniques) uses a statistical labeling toolkit (statistical data) to automatically update features and weights (a relationship between data) extracted from receipt data; Paragraphs [0047], [0055]).

As per claim 12, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the plurality of unsupervised learning techniques includes identifying relationships in data of the unstructured data set based on an access frequency of data of the unstructured data set (analysis by sub-module 60 (unsupervised learning techniques) presents summary analytics for labels (relationships in data) such as a recall measure indicating how much of the desired information is extracted (an access frequency); Figure 1; Paragraphs [0065], [0123]).

As per claim 13, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the plurality of unsupervised learning techniques includes querying external data sources to determine a relationship between data in the unstructured data set (analysis by sub-module 60 (unsupervised learning techniques) consults external merchant APIs (data sources) to map extracted receipt items to canonical and product names (relationship between data); Paragraph [0139]).

As per claim 14, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the plurality of unsupervised learning techniques includes correlating data elements based on text search results (analysis by sub-module 60 (unsupervised learning techniques) compares hand annotation to normalized tokens (correlating data elements) from labels retrieved from text (text search results); Paragraphs [0114], [0115]).

As per claim 15, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the extract module is configured to extract executable code from the one or more structured data sources (email crawling module extracts text in Hypertext Markup Language format (executable code) from the given receipt (data source); Figure 1; Paragraph [0027]) and the unsupervised learning module is configured to determine relationships between data elements based on the executable code (machine learning based sequence labeling module 60 (unsupervised learning module) defines a receipt language model (determine relationships) of features and weights based on items extract from HTML; Paragraph [0047]).

As per claim 16, Thomas discloses the apparatus of claim 1. Thomas additionally discloses, wherein the extract module is configured to extract data from a running data source and the load module is configured to load data extracted from the running data source into the unstructured data set (email crawling module retrieves receipts by periodically scanning an email inbox (running data source) and feature extraction module 38 uses the retrieved receipts to extract receipt data of tokens and features (unstructured data set); Paragraphs [0069], [0076]).

As per claim 17, Thomas discloses a method for performing data analytics using machine learning (extracting details from receipts to train a language model (data analytics) using machine learning; Paragraph [0021]), the method comprising: extracting data from one or more data sources (data from electronic and scanned receipts (data sources); Paragraph [0021]); loading the data into an unstructured data set having an unstructured format (scanning into system 20 extracted unstructured receipt token data; Figure 1; Paragraphs [0027], [0029]); assembling the unstructured data set into an organized data set having a structured format (storing tokens extracted by preprocessing module (assembling the unstructured data set) in Itemizer Annotation File 66 (organized data set) as XML (structured format); Figure 1; Paragraphs [0030], [0058]); and generating one or more learned functions based on the organized data set (storing metrics of evaluation module 64 to machine learning database 70 (learned functions) by comparing events in Itemizer Annotation File 66 (organized data set) to the model; Figure 1; Paragraphs [0060]-[0065]).

-***-Continued Within the Next Supplemental Box-***-

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

-***-Continued from Previous Supplemental Box-***-

As per claim 18, Thomas discloses the method of claim 17. Thomas additionally discloses, wherein assembling the unstructured data set includes assembling the unstructured data set into a structured data set using a plurality of unsupervised learning techniques (normalizing token labels (unstructured data) replacing text blocks from control receipts with normalized text (a structured data set) using Hidden Markov and Conditional Random Field algorithms (unsupervised learning techniques); Figure 1; Paragraphs [0055], [0112], [0129], [0135]).

As per claim 19, Thomas discloses the method of claim 18. Thomas additionally discloses, wherein assembling the unstructured data set includes assembling the unstructured data set into multiple versions of an organized data set (normalizing token labels (unstructured data) replacing text blocks from different versions of control receipts with normalized text (organized data set); Paragraphs [0055], [0112], [0129], [0135]), each of the multiple versions of the organized data set being assembled using a unique combination of the plurality of unsupervised learning techniques (refining how features are extracted from additional receipts into normalized text (each version) by adjusting extraction parameters (unique combination) of the multiple algorithms used for training (unsupervised learning techniques); Paragraphs [0055], [0078], [0115], [0116]).

As per claim 20, Thomas discloses the method of claim 19. Thomas additionally discloses, wherein generating one or more learned functions includes generating one or more machine learning ensembles based on each of the multiple versions of the organized data set (aggregating event counts to indicate accuracy in metric equations (learned functions) to generate an accuracy report of the metrics (machine learning ensemble) of the different versions; Figures 1, 7; Paragraphs [0064], [0065], [0112], [0114]); and the method further comprising determining which machine learning ensemble exhibits the highest predictive performance (choosing the implementation of feature extraction based on the overall quality score F-measure (machine learning ensemble) with the highest scoring receipt (predictive performance); Paragraph [0065]).

As per claim 21, Thomas discloses the method of claim 20. Thomas additionally discloses, wherein assembling the unstructured data set into multiple versions of an organized data set (normalizing token labels (unstructured data set) replacing text blocks from different versions of control receipts with normalized text (an organized data set); Paragraphs [0055], [0112], [0129], [0135]) includes assembling a samples set of the unstructured data set into multiple versions of an organized data set (repeating the normalization on additional test receipts (a samples set) at step 274, again comparing the annotations associated with the different control receipts (multiple versions); Figure 7; Paragraphs [0114], [0115]); and further comprising: assembling the unstructured data set into a complete organized data set using the unique combination of the plurality of unsupervised learning techniques (refining how features are extracted from additional receipts into normalized text until no additional receipts are retrieved at step 276 (a complete organized data set), adjusting extraction parameters (unique combination) for the multiple algorithms used for training (unsupervised learning techniques); Figure 7; Paragraphs [0055], [0078], [0115], [0116]) used to assemble the version of the organized data set determined to have the best predictive quality (to process a retrieved test receipts (version of the organized data set) to determine the highest quality score, F-Measure (a highest predictive performance); Figure 8A; Paragraphs [0065], [0116], [0119]); and generating one or more machine learning ensembles based on the complete organized data set (from metric equations (machine learning ensembles) for a retrieved test receipt that improves the model at step 278; Figures 1, 7; Paragraphs [0064], [0065], [0112], [0114]).

As per claim 22, Thomas discloses an apparatus for performing data analytics using machine learning (a computer system to extract details from receipts to train a language model (data analytics) using machine learning; Paragraphs [0008], [0021]), the apparatus comprising: an unsupervised learning module configured to assemble an unstructured data set into multiple versions of an organized data set (normalization module uses the model (an unsupervised learning module) to normalize token labels (unstructured data set) replacing text blocks from different versions of control receipts with normalized text (an organized data set); Paragraphs [0055], [0112], [0129], [0135]); and a supervised learning module configured to generate one or more machine learning ensembles based on each version of the multiple versions of the organized data set (evaluation module 64 uses supervised learning in the model (supervised learning module) to aggregate event counts and indicate accuracy in metric equations (machine learning ensembles) to generate an accuracy report of the different versions in step 270; Figures 1, 7; Paragraphs [0064], [0065], [0112], [0114]), and to determine which machine learning ensemble exhibits a highest predictive performance (to obtain the quality score, F-Measure, for any given test receipt (which machine learning ensemble exhibits a highest predictive performance); Figure 8A; Paragraphs [0065], [0116], [0119]).

As per claim 23, Thomas discloses the apparatus of claim 22. Thomas additionally discloses, wherein the unsupervised learning module is configured to assemble each version of the organized data set (normalization sub-module 72 (unsupervised learning module) normalizes token labels into different versions of normalized text (organized data set); Figure 1; Paragraphs [0112], [0129], [0135]) using a unique combination of unsupervised learning techniques (refining how features are extracted by adjusting parameters (unique combination) of the multiple algorithms used for training (unsupervised learning techniques); Paragraphs [0055], [0078], [0115], [0116]).

As per claim 24, Thomas discloses the apparatus of claim 22. Thomas additionally discloses, wherein the plurality of unsupervised learning techniques includes clustering data from the unstructured data set using one or more clustering algorithms (analysis by sub-module 60 (unsupervised learning techniques) of features extracted from receipt data includes using software for clustering analysis (clustering data from the unstructured data set); Figure 1; Paragraphs [0048], [0049], [0055]) and one or more of: mining metadata from the data in the unstructured data set (information extraction (mining metadata) and other mining tool operations for text-based data (unstructured data set); Paragraphs [0025], [0048]); identifying relationships in data of the unstructured data set based on one or more of analyzing process reports and analyzing process SQL queries; identifying relationships in data of the unstructured data set by identifying semantic distances between data in the unstructured data set; using statistical data to determine a relationship between data in the unstructured data set; identifying relationships in data of the unstructured data set based on analyzing the access frequency of data of the unstructured data set; querying external data sources to determine a relationship between data m the unstructured data set; and correlating data elements based on text search results.

-***-Continued Within the Next Supplemental Box-***-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US14/42754

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
-***-Continued from Previous Supplemental Box-***-

As per claim 25, Thomas discloses the apparatus of claim 22. Thomas additionally discloses, further comprising: an extract module configured to extract data from one or more structured data sources (email crawling module (extract module) retrieves receipts (data) from HTML emails (structured data sources); Figure 1; Paragraphs [0029], [0030]); and a load module configured to load the data into an unstructured data set having an unstructured format (feature extraction module 38 (load module) extracts receipt labels into a text blocks of tokens (an unstructured data set); Figure 1; Paragraphs [0025], [0035]).

Claims 1-25 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

PCT Recordation of Search History

Case/PCT Application Number: PCT/US14/42754

CLIN Number/Technical Field of PCT Application: 4

Date(s) during which the search was conducted: 11 September 2014 - 19 September 2014

Date of Completion of Recordation of Search History Form: 19 September 2014

Research Analyst Initials: NJH

Search Approval Official (SAO) Initials: HKP

Field of Search/Classification Information:

IPC(8) Classification(s): G06F 17/27, 17/28; G06N 5/02; G10L 15/06 (2014.01)

CPC Classification(s): G06F 17/2785, 17/30713; G10L 15/063; G06N 5/025

Database(s) Searched (Patent and Non-Patent Literature (NPL), Including Sub-Databases and Files Searched) and Search Terms Used:

MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C, B, DE-A, DE-T, DE-U, GB-A, FR-A); ProQuest; IEEE/IEEEXplore; Google/Google Scholar;

KEYWORDS: extract*, load*, structure*, format*, organize*, learn*, assemble*

Database Search String Recordation, Including Dates of Searches):
Patent Database Search Strategy/Results:

#	results	criteria		last run
21	1 hit	Combined query	19 NOT 20	9/17/2014
20	82 hits	Combined query	19 NOT (5 OR 12)	9/17/2014
19	83 hits	Full patent spec	(*3supervise* ADJ2 (learn* OR classif*)) AND ((extract* OR mine* OR mining) ADJ4 (data OR text*)) AND (*2sembl* NEAR10 (predict* OR expla*))	9/17/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
18	31 hits	Combined query	12 AND 17	9/17/2014
17	44172 hits	Combined query	13 OR 14 OR 15 OR 16	9/17/2014
16	7887 hits	Any Classification	G10L001506	9/17/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
15	7922 hits	Any Classification	G06N000502	9/17/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
14	16100 hits	Any Classification	G06F001728	9/17/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
13	17414 hits	Any Classification	G06F001727	9/17/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
12	280 hits	Title or Abstract	machin* AND learn* AND extract* AND data	9/17/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	

#	results	criteria		last run
11	133 hits	Combined query	9 AND 10	9/11/2014
10	85857 hits	Full patent spec	(*4structur* OR *4format* OR *4organi*) AND (*4supervise*)	9/11/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
9	2225 hits	Combined query	6 NOT 8	9/11/2014
8	27 hits	Combined query	6 AND 7	9/11/2014
7	3090 hits	Full patent spec	(*3supervise* ADJ2 (learn* OR classif*)) NEAR30 (*3structur* OR *3format* OR *3organiz* OR *3normaliz* OR *3standardiz* OR raw OR (plain ADJ text*))	9/11/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	

		Years	1836-2014	
6	2252 hits	Combined query	4 NOT 5	9/11/2014
5	242 hits	Title or Abstract	(extract* OR pars* OR retriev* OR min* OR load*) AND (((un OR "not") ADJ2 (structur* OR format* OR organiz* OR normaliz* OR standardiz*)) OR raw OR (plain ADJ text*)) AND (assembl* OR format* OR structur* OR normaliz* OR standardiz*) AND (learn* OR train* OR classif*)	9/11/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
4	2494 hits	Claims, Title or Abstract	(extract* OR pars* OR retriev* OR min* OR load*) AND (((un OR "not") ADJ2 (structur* OR format* OR organiz* OR normaliz* OR standardiz*)) OR raw OR (plain ADJ text*)) AND (assembl* OR format* OR structur* OR normaliz* OR standardiz* OR XML) AND (learn* OR train* OR classif*)	9/11/2014
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
3	5 hits	Assignee/Applicant	PURE*1PREDICT*	9/11/2014
		Full patent spec	(extract* OR pars* OR retriev* OR min* OR load*) AND (((un OR "not" OR no) ADJ2 (structur* OR format* OR organiz* OR normaliz* OR standardiz*)) OR raw OR (plain ADJ text*)) AND (assembl* OR format* OR structur* OR normaliz* OR standardiz* OR XML) AND (learn* OR train* OR classif*)	
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
2	9 hits	Claims, Title or Abstract	learn* OR train*	9/11/2014
		Inventor(s)	(PHILLIP*1S NEAR2 Kelly) OR (WELLMAN NEAR2 Rich*) OR (RAHMAN NEAR2 Sardar) OR (PHILLIPS NEAR2 Matt*)	
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	
1	7 hits	Full patent spec	(extract* OR pars* OR retriev* OR min* OR load*) AND (((un OR "not" OR no) ADJ2 (structur* OR format* OR organiz* OR normaliz* OR standardiz*)) OR raw OR (plain ADJ text*)) AND (assembl* OR format* OR structur* OR normaliz* OR standardiz* OR XML) AND (learn* OR train* OR classif*)	9/11/2014
		Inventor(s)	(PHILLIP*1S NEAR2 Kelly) OR (WELLMAN NEAR2 Rich*) OR (RAHMAN NEAR2 Sardar) OR (PHILLIPS NEAR2 Matt*)	
		Databases	USG USA EPA EPB WO JP DEG DEA DET DEU GBA FRA	
		Years	1836-2014	

ProQuest:
11 September 2014

Set ▾	Search	Databases	Results
S6	⊟ cpc("G06N 5/025") AND (unstructur* OR structur*) AND (learning OR mining) AND ensemble* **Databases:** Derwent World Patents Index® European Patents Fulltext INPADOC / Family and Legal Status	3 databases	30
S5	⊟ cpc("G06N 5/025") AND (unstructur* OR structur*) AND (learning OR mining) **Databases:** Derwent World Patents Index® European Patents Fulltext INPADOC / Family and Legal Status	3 databases	286
S4	⊟ cpc("G10L 15/063") AND (ensembl* OR assembl*) AND (supervise* OR unsupervise*) **Databases:** Derwent World Patents Index® European Patents Fulltext INPADOC / Family and Legal Status	3 databases	9
S3	⊟ cpc("G06F 17/30713") AND *supervise* AND ensemb* **Databases:** Derwent World Patents Index® European Patents Fulltext INPADOC / Family and Legal Status	3 databases	1
S2	⊟ cpc("G06F 17/30713") AND (*supervise* NEAR/3 learn*) AND ensemb* **Databases:** Derwent World Patents Index® European Patents Fulltext INPADOC / Family and Legal Status	3 databases	0
S1	⊟ cpc("G06F 17/2785") AND (machin* NEAR/3 learn*) AND (ensemb* OR assembl*) **Databases:** Derwent World Patents Index® European Patents Fulltext INPADOC / Family and Legal Status	3 databases	8

Non-Patent Literature (NPL) Search Strategy/Results:

ProQuest:
11 September 2014

- (unstructur* NEAR/4 format*) AND (machin* NEAR/2 learn*) AND organiz*
- (integrat* NEAR/10 sourc*) AND structur* AND format* AND languag*
- (text* NEAR/12 pars*) AND (assembl* NEAR/10 structur*) AND train*

Google/Google Scholar:
11 September 2014

- convert unstructured format to train data
- normalize raw text for machine learning
- structure plain text for unsupervised learning

IEEE/IEEEXplore:
11 September 2014

- (structur* <near/10> extract*) AND (semantic* <near/10> classif*) AND learn*
- (text* <near/10> (pars* OR extract*)) AND supervis* AND train*
- (learn* <near/10> function*) AND format* AND text* AND mining

Electronic Acknowledgement Receipt

EFS ID:	20755066
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	20-NOV-2014
Filing Date:	29-MAY-2013
Time Stamp:	18:22:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS10coversheet.pdf	56974 a548b00af1882fa71630d1fd18c050c4d7a0fd04	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS10.pdf	612836 2d8aed4875c779ebf1869f83ebfa3c13bbbafc31	no	5
Warnings:					
Information:					
3	Non Patent Literature	3128_2_5PCT_ISR.pdf	2894260 6b133b9f4adc00bbbfe1d556a310c5349214128a	no	11
Warnings:					
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4	Non Patent Literature	3128_2_7PCT_ISR.pdf	2883962 0e3486f8e6abfebb64a8cbeb079172ea60deeca8	no	11
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5	Non Patent Literature	3128_2_8PCT_ISR.pdf	4158930 6bb6e8aeaad66463a87f903fc9d57788ebcd63b4	no	15
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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CERTIFICATE OF TRANSMISSION

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/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2122 Examiner: Kakali Chaki

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

___ under 37 CFR 1.97(d) together with a:
____ Statement under 37 CFR 1.97(e), and
____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

_____ under 37 CFR 1.97(e),

_____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: November 20, 2014
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7689520		2010-03-30	Burges, et al.	

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	1	20100306141		2010-12-02	Chidlovskii	
	2	20120158620		2012-06-21	Paquet, et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. PCT/US14/10729, 3128.2.4PCT, International Search Report and Written Opinion, August 28, 2014	☐

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EXAMINER SIGNATURE

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-09-16
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
8 EAST BROADWAY
SUITE 600
SALT LAKE CITY, UT 84111

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 28 AUG 2014
Applicant's or agent's file reference 3128-2-4PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 14/10729	International filing date *(day/month/year)* 08 January 2014 (08.01.2014)
Applicant PUREPREDICTIVE, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau of WIPO preferably through ePCT or on paper to, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide,* International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide,* National Chapters.

   Within **19 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide,* International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Lee W. Young PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2014)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 3128-2-4PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 14/10729	International filing date *(day/month/year)* 08 January 2014 (08.01.2014)	(Earliest) Priority Date *(day/month/year)* 08 January 2013 (08.01.2013)
Applicant PUREPREDICTIVE, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

   a. the figure of the **drawings** to be published with the abstract is Figure No. 1

   ☒ as suggested by the applicant.

   ☐ as selected by this Authority, because the applicant failed to suggest a figure.

   ☐ as selected by this Authority, because this figure better characterizes the invention.

   b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 14/10729

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 15/18 (2014.01)
USPC - 706/12
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC: 706/12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 706/934; 706/925; CPC: G06N99/005; G06F17/30542; G06Q10/10 (keyword limited - see search terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase; Google; Google Scholar
Terms: machine, learning, database, predict, forecast, training, confidence, certainty, score, ranking, rate, data, learn, ensemble, modality, algorithm, application, native, integrated, modular, query, search, error, adaptive, trigger.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 7,689,520 B2 (Burges et al.) 30 March 2010 (30.03.2010), entire document, especially abstract, Fig. 1, col. 1, ln 53-58, col. 3, ln 7-17, col. 3, ln 55-61, col. 3, ln 62 to col. 4, ln 3, col. 13, ln 29-45.	1-20
Y	US 2010/0306141 A1 (Chidlovskii) 02 December 2010 (02.12.2010), entire document, especially abstract, para [0005], [0006], [0018], [0021], [0037], [0049].	1-20
A	US 2012/0158620 A1 (Paquet et al.) 21 June 2012 (21.06.2012), entire document.	1-20

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 July 2014 (28.07.2014)	28 AUG 2014
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
8 EAST BROADWAY
SUITE 600
SALT LAKE CITY, UT 84111

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	28 AUG 2014
Applicant's or agent's file reference 3128-2-4PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 14/10729	08 January 2014 (08.01.2014)	08 January 2013 (08.01.2013)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 15/18 (2014.01)
USPC - 706/12

Applicant PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	28 July 2014 (28.07.2014)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/10729

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/10729

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-20	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-20 lack an inventive step under PCT Article 33(3) as being obvious over US 7,689,520 B2 to Burges et al. (hereinafter Burgess) in view of US 2010/0306141 A1 to Chidlovskii.

Regarding claim 1, Burgess teaches an apparatus for machine learning in a data management product (a machine learning system that can be used to rank data with sets, col. 1, ln 53-58), the apparatus comprising: an input module configured to receive an analysis request for a data management product (Fig. 1, input data store 120 contains data to be input to and ranked by the ranking component 110, col. 3, ln 55-61); a learned function module (Fig. 1, ranking component 100 can be any machine learning system that can be trained using gradient descent, col. 3, ln 37-54); and a result module configured to provide native access, within the data management product, to the one or more unknown values (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components, col. 3, ln 62 to col. 4, ln 3). Burges does not expressly teach configured to execute one or more machine learning ensembles to predict one or more unknown values for the data management product. However Chidlovskii, in an analogous art, teaches configured to execute one or more machine learning ensembles (learning algorithm is trained with the training set and the concept evolution model , para [0021]) to predict one or more unknown values for the data management product (train a learning method for predicting class labels for unlabeled elements, para [0018]). It would have been obvious to one skilled in the art to combine the teachings of Burgess with those of Chidlovskii in order to more efficiently classify data items in the data ranking machine learning system of Burges (see Chidlovskii para [0005]-[0006]).

Regarding claim 2, Burges further teaches wherein one or more of the input module, the learned function module, and the result module are integrated with the data management product as one or more of an add-on, a plug-in, and an extension (a component can be a process running on a processor, a processor, an object, an executable, a program, and/or a computer. Also, both an application running on a server and the server can be components, col. 3, ln 7-17).

Regarding claim 3, Chidlovskii further teaches wherein the result module is further configured to provide native access, within the data management product, to a confidence value corresponding to each of the one or more unknown values (computing a confidence factor that the initial training set of predicted classes defined by element instance features within the data item, para [0037]).

Regarding claim 4, Burgess further teaches an ensemble factory module configured to generate the one or more machine learning ensembles using training data from the data management product (Fig. 4, an exemplary training set 400 is depicted. The training set 400 is subdivided into training examples 410 that are grouped into training pairs 420, col. 13, ln 29-45). Chidlovskii further teaches the one or more machine learning ensembles configured to predict the one or more unknown values in the data management product using workload data from the data management product (classified is initially annotated in accordance with a training set of predicted classes to be associated with element instances within the data item 10, para [0037]).

Regarding claim 5, Burgess further teaches wherein the result module provides native access through one or more of a native query language and a native interface of the data management product (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components or presented to a user, or both. An example of such ranked data is the result of a search for documents on a network, such as web pages on the Internet, that are responsive to a user's query. A set of responsive documents may be presented as input data and ranked in an order based upon certain criteria before being presented to the user as ranked search results, col. 3, ln 62 to col. 4, ln 3).

---continued in supplemental box---

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 6, Burgess teaches a method for machine learning in a data management product (a machine learning system that can be used to rank data with sets, col. 1, ln 53-58), the method comprising: receiving an analysis request for a data management product (Fig. 1, input data store 120 contains data to be input to and ranked by the ranking component 110, col. 3, ln 55-61); and providing native access, within the data management product, to one or more predicted values corresponding to the one or more unknown values (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components, col. 3, ln 62 to col. 4, ln 3). Burgess does not expressly teach executing one or more machine learning ensembles to predict one or more unknown values for the data management product. However Chidlovskii, in an analogous art, teaches executing one or more machine learning ensembles (learning algorithm is trained with the training set and the concept evolution model , para [0021]) to predict one or more unknown values for the data management product (train a learning method for predicting class labels for unlabeled elements, para [0018]). It would have been obvious to one skilled in the art to combine the teachings of Burgess with those of Chidlovskii in order to more efficiently classify data items in the data ranking machine learning system of Burges (see Chidlovskii para [0005]-[0006]).

Regarding claim 7, Chidlovskii further teaches providing native access, within the data management product, to a confidence value corresponding to each of the one or more unknown values (computing a confidence factor that the initial training set of predicted classes defined by element instance features within the data item, para [0037]).

Regarding claim 8, Burges further teaches modifying a data structure of the data management product (program modules include routines, programs, components, data structures, col. 16, ln 24-39). Chidlovskii further teaches to store the one or more predicted values (annotated in accordance with a training set of predicted classes to be associated with element instances within the data item 10, para [0037]).

Regarding claim 9, Burges further teaches wherein providing native access includes providing access through one or more of a native query language and a native interface of the data management product (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components or presented to a user, or both. An example of such ranked data is the result of a search for documents on a network, such as web pages on the Internet, that are responsive to a user's query. A set of responsive documents may be presented as input data and ranked in an order based upon certain criteria before being presented to the user as ranked search results, col. 3, ln 62 to col. 4, ln 3).

Regarding claim 10, Burges further teaches generating the one or more machine learning ensembles using training data from the data management product (Fig. 4, an exemplary training set 400 is depicted. The training set 400 is subdivided into training examples 410 that are grouped into training pairs 420, col. 13, ln 29-45). Chidlovskii further teaches the one or more machine learning ensembles configured to predict the one or more unknown values in the data management product using workload data from the data management product (classified is initially annotated in accordance with a training set of predicted classes to be associated with element instances within the data item 10, para [0037]).

Regarding claim 11, Chidlovskii further teaches receiving, by the machine learning module, a new ensemble request from the data management product (an adoption of a major active learning principle, namely uncertainty based sampling. It is based on measuring the learner confidence on unlabeled instances, para [0032]), wherein generating the one or more machine learning ensembles comprises: receiving the training data, the training data being associated with the new ensemble request (model function is defined as a complex curb (or non-linear SVM kernels), and an active learning principle is used to estimate the parameters for the optimal separation curb. In FIG. 3, question marks point to the most uncertain elements according to the last model trained with the available training set, para [0049]); generating a plurality of learned functions using the training data; evaluating the plurality of learned function using test data from the training data; and forming a machine learning ensemble comprising two or more learned functions based on the evaluation of the plurality of learned functions (Core features f.sub.1 to f.sub.3 are reported for all instances and are used to train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x). Observation x.sub.7 is the most uncertain and therefore is the top candidate for new labeling, para [0049]).

Regarding claim 12, Chidlovskii further teaches wherein the plurality of learned functions are generated from multiple classes using the training data and the machine learning ensemble is formed by combining a subset of the plurality of learned functions from at least two classes of the multiple classes (shows four instances x.sub.1 to x.sub.4 annotated with classes y.sub.1 and y.sub.2 (marked with) and at least three unlabeled instances x.sub.5 to x.sub.7. Core features f.sub.1 to f.sub.3 are reported for all instances and are used to train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x). Observation x.sub.7 is the most uncertain and therefore is the top candidate for new labeling, para [0049]).

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/10729

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 13, Chidlovskii further teaches wherein generating the one or more machine learning ensembles comprises: generating a plurality of learned functions (an adoption of a major active learning principle, namely uncertainty based sampling. It is based on measuring the learner confidence on unlabeled instances, para [0032]); evaluating the plurality of learned function (model function is defined as a complex curb (or non-linear SVM kernels), and an active learning principle is used to estimate the parameters for the optimal separation curb, para [0049]); combining the plurality of learned functions in a plurality of learned function combinations (shows four instances x.sub.1 to x.sub.4 annotated with classes y.sub.1 and y.sub.2 (marked with) and at least three unlabeled instances x.sub.5 to x.sub.7. Core features f.sub.1 to f.sub.3 are reported for all instances and are used to train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x). Observation x.sub.7 is the most uncertain and therefore is the top candidate for new labeling, para [0049]); evaluating the plurality of learned function combinations (train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x), para [0049]). Burges further teaches extending the plurality of learned function combinations with one or more layers, at least one of the layers comprising a probabilistic model (Ranks can be modeled probabilistically: that is, for each pair i, j, the model will learn an approximation to the probability that r.sub.i>r.sub.j. A probabilistic model may be more desirable for this problem than in the case of pattern recognition or regression estimation because during labeling, col. 6, ln 1-28); evaluating the extended combined learned functions using test data; selecting a subset of the extended combined learned functions (map R can be many to one in the sense that multiple samples can have the same rank, but every training sample is assigned a rank. In a more flexible manner, pairs of training examples can be presented to the system, where the first element of the pair is desired to be ranked above the second, col. 6, ln 1-28); synthesizing the selected subset of the extended combined learned functions with metadata generated by the evaluations (both the original image and metadata associated with the image can be used to generate features, col. 13, ln 46-65).

Regarding claim 14, Chidlovskii further teaches wherein the one or more machine learning ensembles are generated automatically in response to one or more of a command and a query from a user of the data management product without further interaction with the user (A confidence factor is computed that the applied annotation is accurate. When an element instance is identified such that a corresponding applied annotation has a low confidence factor, the applied annotation is adjusted by changing the classifying defining features of the selected item. A second annotating model is then composed for more accurate classifying of the data item, para [0021]).

Regarding claim 15, Chidlovskii further teaches regenerating the one or more machine learning ensembles in response to a trigger event (When an element instance is identified such that a corresponding applied annotation has a low confidence factor, the applied annotation is adjusted by changing the classifying defining features of the selected item. A second annotating model is then composed for more accurate classifying of the data item, para [0021]).

Regarding claim 16, Burges further teaches wherein the trigger event includes one or more of a change in data stored in the data management product, a manual update request, and a passing of a predetermined amount of time (a method for allowing the neural network to choose any mapping that is as consistent as possible with the set of ranked pairs used for training. Whereas in usual neural network training, the cost function is a function of the network output of a single pattern, here it is taken to be a function of the difference of the network outputs of a pair of patterns, col. 6, ln 28-53).

Regarding claim 17, Chidlovskii further teaches wherein the data management product comprises a spreadsheet product (data collection or an element instance within a document. Any element instance in the document is associated with a set of features indicative of accurate identification of the element instance, para [0018]).

Regarding claim 18, Burges further teaches wherein the data management product comprises a database product that operates using a structured query language (SQL) (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components or presented to a user, or both. An example of such ranked data is the result of a search for documents on a network, such as web pages on the Internet, that are responsive to a user's query. A set of responsive documents may be presented as input data and ranked in an order based upon certain criteria before being presented to the user as ranked search results, col. 3, ln 62 to col. 4, ln 3).

Regarding claim 19, Burges teaches a method for machine learning in a data management product (a machine learning system that can be used to rank data with sets, col. 1, ln 53-58), the method comprising: providing a machine learning module in communication with a data management product (Fig. 1, input data store 120 contains data to be input to and ranked by the ranking component 110, col. 3, ln 55 -61); receiving training data from the data management product (Fig. 1, ranking component 100 can be any machine learning system that can be trained using gradient descent, col. 3, ln 37-54); generating a plurality of learned functions using the training data (ranking component 110 processes the data and outputs a set of ranked data 130 that may then be used by other components, col. 3, ln 62 to col. 4, ln 3). Burgess does not expressly teach transmitting a new ensemble request from the data management product to the machine learning module; forming a machine learning ensemble based on the plurality of learned functions; and integrating the machine learning ensemble with the data management product to provide access to machine learning results within the data management product. However Chidlovskii, in an analogous art, teaches transmitting a new ensemble request from the data management product to the machine learning module (learning algorithm is trained with the training set and the concept evolution model , para [0021]); forming a machine learning ensemble based on the plurality of learned functions (train a learning method for predicting class labels for unlabeled elements, para [0018]); and integrating the machine learning ensemble with the data management product to provide access to machine learning results within the data management product (a component can be a process running on a processor, a processor, an object, an executable, a program, and/or a computer. Also, both an application running on a server and the server can be components, col. 3, ln 7-17). It would have been obvious to one skilled in the art to combine the teachings of Burgess with those of Chidlovskii in order to more efficiently classify data items in the data ranking machine learning system of Burges (see Chidlovskii para [0005]-[0006]).

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 14/10729

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 20, Chidlovskii further teaches wherein forming a machine learning ensemble based on the plurality of learned functions (an adoption of a major active learning principle, namely uncertainty based sampling. It is based on measuring the learner confidence on unlabeled instances, para [0032]) comprises: evaluating the plurality of learned function (model function is defined as a complex curb (or non-linear SVM kernels), and an active learning principle is used to estimate the parameters for the optimal separation curb, para [0049]); combining the plurality of learned functions m a plurality of learned function combinations (shows four instances x.sub.1 to x.sub.4 annotated with classes y.sub.1 and y.sub.2 (marked with) and at least three unlabeled instances x.sub.5 to x.sub.7. Core features f.sub.1 to f.sub.3 are reported for all instances and are used to train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x). Observation x.sub.7 is the most uncertain and therefore is the top candidate for new labeling, para [0049]); evaluating the plurality of learned function combinations (train the basic learning algorithm and evaluating the normalized ME-confidence conf.sub.me.sup.n(x), para [0049]). Burges further teaches extending the plurality of learned function combinations with one or more layers, at least one of the layers comprising a probabilistic model (Ranks can be modeled probabilistically: that is, for each pair i, j, the model will learn an approximation to the probability that r.sub.i>r.sub.j. A probabilistic model may be more desirable for this problem than in the case of pattern recognition or regression estimation because during labeling, col. 6, ln 1-28); evaluating the extended combined learned functions using test data; selecting a subset of the extended combined learned functions (map R can be many to one in the sense that multiple samples can have the same rank, but every training sample is assigned a rank. In a more flexible manner, pairs of training examples can be presented to the system, where the first element of the pair is desired to be ranked above the second, col. 6, ln 1-28); synthesizing the selected subset of the extended combined learned functions with metadata generated by the evaluations; and organizing the synthesized subset into a machine learning ensemble (both the original image and metadata associated with the image can be used to generate features, col. 13, ln 46-65).

Claims 1-20 have industrial applicability as defined by PCT Article 33(4), because the subject matter can be made or used in industry.

Electronic Acknowledgement Receipt

EFS ID:	20153983
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	17-SEP-2014
Filing Date:	29-MAY-2013
Time Stamp:	00:19:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS9CoverSheet.pdf	47461 edfad7da1e3fb6c6167ccaff277cfad625b4d2f3	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS9.pdf	612354 448c7970d76ed0308e215ec2e208cb6d7dde6a6c	no	4
Warnings:					
Information:					
3	Non Patent Literature	3128_2_4PCT_ISR_8_28_2014.pdf	1750985 a60499161e609b14bdc42382a7d4fa0ffece999d	no	9
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New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
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New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2122 Examiner: Kakali Chaki

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

___ under 37 CFR 1.97(d) together with a:
____ Statement under 37 CFR 1.97(e), and
____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

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_____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: September 16, 2014
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	13904963
Filing Date	2013-05-29
First Named Inventor	Kelly D. Phillipps
Art Unit	2122
Examiner Name	Kakali Chaki
Attorney Docket Number	3128.2.5

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	1	20100131314		2010-05-27	Ting, et al.	
	2	20110111384		2011-05-12	Dietrich, et al.	
	3	20130004930		2013-01-03	Sorenson, et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

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	1	Application No. 13/749,618, 3128.2.3, Office Action, July 8, 2014	☐
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Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-07-09
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	19535985
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	09-JUL-2014
Filing Date:	29-MAY-2013
Time Stamp:	18:56:57
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS8CoverSheet.pdf	56593 83fb16e4e1f3b9bb418aa2b2c5f5092567a4fb1b	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS8.pdf	612304 303e8f361ce4f7d3c38f6fe1e0fafa7a0f3fba19	no	4
Warnings:					
Information:					
3	Non Patent Literature	3128_2_3_OfficeAction_07_08_14.pdf	1495455 0da7867a7b87684634eed2f4f89f6838328a9027	no	17
Warnings:					
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New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
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/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2122 Examiner: Kakali Chaki

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
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Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: July 9, 2014
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

PTO/SB/08a (01-10)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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(Not for submission under 37 CFR 1.99)

Application Number	13904963
Filing Date	2013-05-29
First Named Inventor	Kelly D. Phillipps
Art Unit	2122
Examiner Name	Kakali Chaki
Attorney Docket Number	3128.2.5

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8214308		2012-07-03	Chu	
	2	8370280		2013-02-05	Lin, et al.	

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20140136452		2014-05-15	Wellman, et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. 13/870,861, 3128.2.1US1, Notice of Allowance, June 20, 2014	☐
	2	BENNETT, CASEY C., "EHRs Connect Research and Practice: Where Predictive Modeling, Artificial Intelligence, and Clinical Decision Support Intersect", Health Policy and Technology (2012), pgs. 24	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-06-20
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	19367330
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	24-JUN-2014
Filing Date:	29-MAY-2013
Time Stamp:	20:05:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS7CoverSheet.pdf	56375 7e879a8139698812 16f42734154a8310f73d542d	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS7.pdf	612502 d2954b22cf4eccd190582fab909932384e2155cc	no	4
Warnings:					
Information:					
3	Non Patent Literature	3128_2_1US1_NoticeofAllowance_06_20_14.pdf	2018730 38e6f551228526af37bcf05415c66cb167c3a1b6	no	20
Warnings:					
Information:					
4	Non Patent Literature	EHRs_Connect.pdf	880906 c21d7f88a68784891ec7c3e820de78ee10cd4795	no	24
Warnings:					
Information:					
			Total Files Size (in bytes):	3568513	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by either submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 to on June 20, 2014.

/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2122 Examiner: Kakali Chaki

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

___ under 37 CFR 1.97(d) together with a:
_____ Statement under 37 CFR 1.97(e), and
_____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

_____ under 37 CFR 1.97(e),

_____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: June 20, 2014
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13904963
Filing Date	2013-05-29
First Named Inventor	Kelly D. Phillipps
Art Unit	2122
Examiner Name	Kakali Chaki
Attorney Docket Number	3128.2.5

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6507726		2003-01-14	Atkinson, et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090186329		2009-07-23	Connor	
	2	20090035733		2009-02-05	Meitar, et al.	
	3	20100009330		2010-01-14	Yaskin	
	4	20070111179		2007-05-17	Hochwarth, et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]

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	Application Number	13904963
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	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

	1	102010046439	DE		2012-03-29	Landwehr		☐
If you wish to add additional Foreign Patent Document citation information please click the Add button Add								
NON-PATENT LITERATURE DOCUMENTS Remove								
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.						T[5]
	1	Application No. PCT/US2014/013028, 3128.2.3pct, International Search Report and Written Opinion, May 15, 2014						☐
If you wish to add additional non-patent literature document citation information please click the Add button Add								

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

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OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-05-19
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
8 EAST BROADWAY
SUITE 600
SALT LAKE CITY, UT 84111

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing *(day/month/year)* 15 MAY 2014
Applicant's or agent's file reference 3128-2-3PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US2014/013028	International filing date *(day/month/year)* 24 January 2014
Applicant PUREPREDICTIVE, INC.	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 3128-2-3PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2014/013028	International filing date *(day/month/year)* 24 January 2014	(Earliest) Priority Date *(day/month/year)* 24 January 2013
Applicant PUREPREDICTIVE, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

   ☒ the text is approved as submitted by the applicant.

   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

   a. the figure of the **drawings** to be published with the abstract is Figure No. 1A

   ☐ as suggested by the applicant.

   ☐ as selected by this Authority, because the applicant failed to suggest a figure.

   ☒ as selected by this Authority, because this figure better characterizes the invention.

   b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2014/013028

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G09B 7/00 (2014.01)
USPC - 434/350
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - G09B 3/00, 5/00, 5/14, 7/00, 7/04 (2014.01)
USPC - 273/432; 434/322, 350, 354, 362

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
CPC - G09B 5/067, 5/08, 5/125; G06Q 10/101 (2014.02)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Orbit, Google Patents, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009/0186329 A1 (CONNOR) 23 July 2009 (23.07.2009) entire document	1-27
Y	US 2009/0035733 A1 (MEITAR et al) 05 February 2009 (05.02.2009) entire document	1-27
Y	US 2010/0009330 A1 (YASKIN) 14 January 2010 (14.01.2010) entire document	2
Y	US 2007/0111179 A1 (HOCHWARTH et al) 17 May 2007 (17.05.2007) entire document	8-9, 17-18, 21
Y	DE 10 2010 046 439 A1 (LANDWEHR) 29 March 2012 (29.03.2012) see machine translation	10
Y	US 6,507,726 B1 (ATKINSON et al) 14 January 2003 (14.01.2003) entire document	11

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
02 May 2014	15 MAY 2014
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: SCOTT C. HILTON
8 EAST BROADWAY
SUITE 600
SALT LAKE CITY, UT 84111

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	15 MAY 2014
Applicant's or agent's file reference 3128-2-3PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2014/013028	24 January 2014	24 January 2013

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G09B 7/00 (2014.01)
USPC - 434/350

Applicant PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- [X] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [X] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	02 May 2014	Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2014/013028

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

      ☐ on paper

      ☐ in electronic form

   b. (time)

      ☐ in the international application as filed

      ☐ together with the international application in electronic form

      ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2014/013028

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	1-27	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-27	NO
Industrial applicability (IA)	Claims	1-27	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1, 3-7, 12-16, 19-20, 22-27 lack an inventive step under PCT Article 33(3) as being obvious over Connor in view of , and further in view of Meitar et al. (hereinafter, Meitar).

Regarding claim 1, Connor discloses a method, the method comprising:
receiving data collected from interactions of a plurality of students with an electronic learning system ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130; [0013] Step S110, which includes collecting results of a first literacy test of a first group of students, functions to gather information about an initial literacy performance level of a student; [0016] Step S130, which includes collecting results of a second literacy test of a first group of students, functions to determine literacy progress of a student since the first literacy test);
identifying a plurality of archetypal learning patterns in the received data using machine learning ([0012] identifying learning patterns based on the student profile data and teaching plan data S140, and implementing a recommendation engine; [0017] Step S140, which includes identifying learning patterns based on the student profile data and teaching plan data, functions to analyze the teaching plan data and student profile and identify patterns in the educational process. The learning patterns are preferably relationships between an initial literacy performance, final literacy performance, characteristics of the educational method, and additionally other data stored within the student profile); and
associating each student with at least one of the identified archetypal learning patterns using the machine learning ([0012] The implementation of the recommendation engine includes: matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern S160, and recommending a teaching plan for a student of the second group of students S170. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans; [0020] Step S160, which includes matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern, functions to determine a teaching plan pattern that generally produces an increase in literacy performance over a stage of education), but does not explicitly disclose a method for determining student engagement.
In the field of electronic learning ([0001]), Meitar teaches a method for determining student engagement ([0126] The student stations 301-303 are used by students to perform personal learning activities, to conduct personal assignments, to participate in learning activities in-class, to participate in assessment activities, to collaborate in group assignments, to participate in discussions, to perform exercises, to participate in a learning community, to communicate with the teacher station 310 or with other student stations 301-303, to receive or perform personalized learning activities, or the like; [0135] teaching, learning and/or assessment activities are monitored, recorded and stored; [0137] the generated reports are used as alternative or additional assessment of students performance, students' knowledge, students classroom behavior [engagement], e.g., a student is responsive to instructions, a student is non-responsive to instructions, or other student parameters). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide methods of adaptive teaching and learning (Meitar, [0003]).

Regarding claim 3, Connor further teaches the method of claim 1, further comprising sending data for at least one student of the plurality of students based on the at least one archetypal learning pattern associated with the at least one student ([0021] produce recommendations [i.e., data] for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation preferably specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc. Preferably, a software application provides [i.e., sends] the teaching plan recommendation. The various student, group, or class teaching plan recommendations are additionally communicated through the software application. The lesson plan is preferably specific for a class, group and/or student), but is silent on sending an alert for at least one student.
Meitar teaches sending an alert for at least one student ([0133] the teacher station 310 may generate an alert-type message that alerts the teacher to a particular event, e.g., failure or success of a student or a group of students; [0134] For example, system 300 may alert the teacher, using a graphical or textual or audible notification through the teacher station 310, that one or more students or groups of students do not progress at all, or according to pre-defined mile-stones in the learning activity or learning object assigned to them). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to substantially continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

WRITTEN OPINION OF THE
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Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding claim 4, Connor further teaches the method of claim 1, wherein the plurality of archetypal learning patterns are based at least partially on known learning outcomes for a set of students ([0013] The first literacy test is administered at the beginning of a new school year, but may alternatively be administered at any suitable time such as when starting a new literacy curriculum, when a new student arrives, or at agreed upon date. The result of the literacy test is stored in a student profile. The student profile additionally or alternatively includes additional test results, and/or any suitable data on educational variables – it is interpreted that the first literacy test result and the additional test results are representative of known learning outcomes; [0017] The learning patterns are relationships between an initial literacy performance, final literacy performance, characteristics of the educational method, and additionally other data stored within the student profile).

Regarding claim 5, Connor further teaches the method of claim 1, but is silent on wherein the received data comprises monitored mouse movement of the plurality of students using the electronic learning system.
Meitar teaches wherein received data comprises monitored mouse movement of a plurality of students using the electronic learning system ([0132] System 300 monitors, logs and reports the performance of student based on their operation of student stations 301-303. System 300 may determine and report that Student B did not operate the keyboard or mouse for a particular time period, e.g., two minutes; [0150] the integrated evaluation and assessment module 403 may determine that the user of a particular student station did not operate its student station, e.g., did not move the mouse, did not click the mouse, for at least a pre-defined time period, e.g., two minutes). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

Regarding claim 6, Connor further teaches the method of claim 1, but is silent on wherein the received data comprises an amount of time the plurality of students remain on areas of a presented page of the electronic learning system.
Meitar teaches wherein received data comprises an amount of time a plurality of students remain on areas of a presented page of the electronic learning system ([0132] System 300 monitors, logs and reports the performance of student based on their operation of student stations 301-303. System 300 may determine and report that Student A appears to be "stuck" or lingering on a particular exercise or learning object; [0134] the teacher may use the teacher station 310 to view a report detailing progress status of students, e.g., whether the student is "stuck" for more than sixty seconds in front of the third question or the fourth screen of a learning object). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

Regarding claim 7, Connor further teaches the method of claim 1, but is silent on wherein the received data comprises text selected by the plurality of students from material of the electronic learning system.
Meitar teaches wherein received data comprises text selected by a plurality of students from material of an electronic learning system ([0106] A learning object includes a stand-alone application, applet, program, or assignment addressed to a student. For example, learning object 211 is an Active-X interactive animated story, in which a student is required to select graphical items using a pointing device, learning object 213 is a Flash application in which the student is required to move textual objects, learning object 215 is a JavaScript program in which the student selects answers in a multiple-choice quiz. Learning objects may include various other content items, for example, interactive text or "live text", writing tools, textual content, or the like). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide various ways to determine the skill level of a student.

Regarding claim 12, Connor further teaches the method of claim 1, but is silent on wherein the received data is collected using executable code embedded in pages sent to the plurality of students by the electronic learning system.
Meitar teaches wherein received data is collected using executable code embedded in pages sent to a plurality of students by an electronic learning system ([0104] system 100 may be implemented using a web 108, such that one or substantially all functions of teaching/learning are available through a web, optionally utilizing web services or web components e.g., web browsers, plug-ins, web applets, or the like – it is known in the art that plug-ins are embedded inside a webpage). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to affect only the page in which the code is embedded.

Regarding claim 13, Connor discloses an apparatus for determining student engagement, the apparatus comprising:
an activity monitor module configured to receive monitored electronic learning interactions of one or more students ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130; [0013] Step S110, which includes collecting results of a first literacy test of a first group of students, functions to gather information about an initial literacy performance level of a student; [0016] Step S130, which includes collecting results of a second literacy test of a first group of students, functions to determine literacy progress of a student since the first literacy test);
a machine learning module configured to compare, using machine learning, the monitored electronic learning interactions to a plurality of archetypal learning patterns ([0012] identifying learning patterns based on the student profile data and teaching plan data and implementing a recommendation engine. The implementation of the recommendation engine includes: matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern S160. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans; [0020] Step S160, which includes matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern, functions to determine a teaching plan pattern that generally produces an increase in literacy performance over a stage of education); and
a result module based on the machine learning comparison ([0012] recommending a teaching plan for a student of the second group of students S170; [0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student. [0021]Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on wherein the result module is configured to send an alert for at least one student of the one or more students.

WRITTEN OPINION OF THE
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Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Meitar teaches a module configured to send an alert for at least one student of the one or more students ([0133] the teacher station 310 may generate an alert-type message that alerts the teacher to a particular event, e.g., failure or success of a student or a group of students; [0134] For example, system 300 may alert the teacher, using a graphical or textual or audible notification through the teacher station 310, that one or more students or groups of students do not progress at all, or according to pre-defined mile-stones in the learning activity or learning object assigned to them). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to substantially continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

Regarding claim 14, Connor further teaches the apparatus of claim 13, wherein the result module is configured to recommend a learning action to take with regard to the at least one student, the machine learning module configured to determine the recommended learning action using machine learning ([0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student; [0021] Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on to send the alert to an authority associated with the at least one student.
Meitar teaches to send an alert to an authority associated with at least one student ([0134] reports or alerts may be generated by system 300 substantially in real-time, during the lesson process in class. For example, system 300 may alert the teacher [i.e., authority], using a graphical or textual or audible notification through the teacher station 310, that one or more students or groups of students do not progress at all, or according to pre-defined mile-stones in the learning activity or learning object assigned to them). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to further retrieve details of the actual progress, for example, by obtaining detailed information on the progress of the relevant student(s) (Meitar, [0134]).

Regarding claim 15, Connor further teaches the apparatus of claim 13, wherein the result module is configured to recommend a learning action for the student to take, the machine learning module configured to determine the recommended learning action using machine learning ([0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student; [0021] Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on to send the alert to the at least one student.
Meitar teaches to send an alert to at least one student ([0151] an alert message may be transferred to the teacher station. Optionally, additional notification may be presented to the student on the relevant student station, e.g., alerting the attention of the student to the determined triggering event. Optionally, additional help or support information, e.g., educational content, explanations, narrations, or the like, may be presented to the student on the relevant student station, either automatically or in response to a pre-approval of the teacher using the teacher station). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to enable students to obtain assistance or help.

Regarding claim 16, Connor further teaches the apparatus of claim 15, but is silent on wherein the alert comprises a real-time notification presented to the at least one student during the electronic learning interactions of the at least one student.
Meitar teaches wherein an alert comprises real-time notification presented to at least one student during electronic learning interactions of the at least one student ([0031] the assessment module is to generate an alert substantially in real-time; [0151] an alert message may be transferred to the teacher station. Optionally, additional notification may be presented to the student on the relevant student station, e.g., alerting the attention of the student to the determined triggering event. Optionally, additional help or support information, e.g., educational content, explanations, narrations, or the like, may be presented to the student on the relevant student station, either automatically or in response to a pre-approval of the teacher using the teacher station). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to enable students to obtain assistance or help.

Regarding claim 19, Connor further teaches the apparatus of claim 13, but is silent on wherein the monitored electronic learning interactions comprise one or more of monitored mouse movement of the one or more students, an amount of time the one or more students remain on a presented electronic learning page, and text selected by the one or more students from electronic learning material.
Meitar teaches wherein monitored electronic learning interactions comprise one or more of monitored mouse movement of the one or more students, an amount of time the one or more students remain on a presented electronic learning page, and text selected by the one or more students from electronic learning material ([0132] System 300 monitors, logs and reports the performance of student based on their operation of student stations 301-303. System 300 may determine and report that Student B did not operate the keyboard or mouse for a particular time period, e.g., two minutes; [0150] the integrated evaluation and assessment module 403 may determine that the user of a particular student station did not operate its student station, e.g., did not move the mouse, did not click the mouse, for at least a pre-defined time period, e.g., two minutes). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding claim 20, Connor further teaches the apparatus of claim 13, but is silent on wherein the activity module is configured to receive the monitored electronic learning interactions from one or more of a browser extension installed in internet browsers for each of the one or more students, a proxy server disposed between the one or more students and an electronic learning system providing the electronic learning interactions, and executable code embedded in pages with which one or more students are interacting.
Meitar teaches wherein an activity module is configured to receive monitored electronic learning interactions from one or more of a browser extension installed in internet browsers for each of the one or more students, a proxy server disposed between one or more students and an electronic learning system providing the electronic learning interactions, and executable code embedded in pages with which one or more students are interacting ([0104] system 100 may be implemented using a web 108, such that one or substantially all functions of teaching/learning are available through a web, optionally utilizing web services or web components e.g., web browsers, plug-ins, web applets, or the like – it is known in the art that plug-ins are embedded inside a webpage). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to affect only the page in which the code is embedded.

Regarding claim 22, Connor discloses a computer program product comprising a computer readable storage medium storing computer usable program code executable to perform operations ([0015] a software application is preferably a web application, but may be any suitable computer or device program; [0021] a software application provides the teaching plan recommendation), the operations comprising:
receiving data associated with interaction of a plurality of students with electronic learning material ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130; [0013] Step S110, which includes collecting results of a first literacy test of a first group of students, functions to gather information about an initial literacy performance level of a student; [0016] Step S130, which includes collecting results of a second literacy test of a first group of students, functions to determine literacy progress of a student since the first literacy test); and
comparing, using machine learning, the data associated with the interaction with a plurality of archetypal learning patterns ([0012] identifying learning patterns based on the student profile data and teaching plan data and implementing a recommendation engine. The implementation of the recommendation engine includes: matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern S160, and recommending a teaching plan for a student of the second group of students S170. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans; [0020] Step S160, which includes matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern, functions to determine a teaching plan pattern that generally produces an increase in literacy performance over a stage of education); but is silent on determining student engagement; and evaluating the electronic learning material based on the machine learning comparison.
Meitar teaches a method for determining student engagement ([0126] The student stations 301-303 are used by students to perform personal learning activities, to conduct personal assignments, to participate in learning activities in-class, to participate in assessment activities, to collaborate in group assignments, to participate in discussions, to perform exercises, to participate in a learning community, to communicate with the teacher station 310 or with other student stations 301-303, to receive or perform personalized learning activities, or the like; [0135] teaching, learning and/or assessment activities are monitored, recorded and stored; [0137] the generated reports are used as alternative or additional assessment of students performance, students' knowledge, students classroom behavior [engagement], e.g., a student is responsive to instructions, a student is non-responsive to instructions, or other student parameters); and
evaluating an electronic learning material based on a machine learning comparison ([0167] store the teacher's newly-created content and/or the teacher's modified content, e.g., reflecting changes that the teacher introduced to system-provided content, and/or imported educational content. Workstation 500 further includes a content publishing module 534, to allow the teacher to manage a publishing process for created and/or modified and/or imported educational content, e.g., transferring or sending altered or created content from the teacher's personal content repository 533 to other teacher stations, to a shared or general repository accessible by other teachers, or the like. Optionally, the publishing process includes review [i.e., evaluation] and approval procedures, e.g., by other teachers, and results in the placing of approved educational content in a publicly accessible repository such that other teachers may use it; [0022] automatically modifying the second portion of the digital learning activity based on performance by the student of the first portion of the digital learning activity; [0034] the lesson planning module is to modify the lesson plan). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide methods of adaptive teaching and learning (Meitar, [0003]).

Regarding claim 23, Connor further teaches the computer program product of claim 22, but is silent on the operations further comprising recommending based on the machine learning comparison ([0012] identifying learning patterns based on the student profile data and teaching plan data S140, and implementing a recommendation engine. The implementation of the recommendation engine includes: collecting results of a third literacy test of a second group of students S150, matching [i.e., comparing] a student profile of a student of the second group of students with an identified learning pattern S160, and recommending a teaching plan for a student of the second group of students S170. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans), but is silent on a modification to the electronic learning material.
Meitar teaches modification to the electronic learning material ([0022] automatically modifying the second portion of the digital learning activity based on performance by the student of the first portion of the digital learning activity; [0034] the lesson planning module is to modify the lesson plan; [0147] The educational content 401 includes learning materials created by modifying prior or other learning materials). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide replacement of a first learning activity in the lesson plan with a second, different, learning activity (Meitar, [0042]).

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2014/013028

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:

Regarding claim 24, Connor discloses a system, the system comprising:
a module comprising, an activity monitor module configured to monitor electronic learning interactions of the plurality of students with electronic learning material ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130; [0013] Step S110, which includes collecting results of a first literacy test of a first group of students, functions to gather information about an initial literacy performance level of a student; [0016] Step S130, which includes collecting results of a second literacy test of a first group of students, functions to determine literacy progress of a student since the first literacy test); and
a machine learning module configured to associate a student with a determined learning archetype, using machine learning, based on the monitored electronic learning interactions and on publisher data from the one or more electronic learning publishers ([0012] identifying learning patterns based on the student profile data and teaching plan data [i.e., publisher data], and implementing a recommendation engine. The implementation of the recommendation engine includes: matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern S160, and recommending a teaching plan for a student of the second group of students S170. Obtaining learning patterns from a teaching plan database functions to determine ideal teaching plans; [0020] Step S160, which includes matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern, functions to determine a teaching plan pattern that generally produces an increase in literacy performance over a stage of education), but does not explicitly disclose a system for determining student engagement; a student engagement module configured to be in communication with a plurality of students, one or more electronic learning publishers one or more learning institutions.
Meitar teaches a system for determining student engagement ([0126] The student stations 301-303 are used by students to perform personal learning activities, to conduct personal assignments, to participate in learning activities in-class, to participate in assessment activities, to collaborate in group assignments, to participate in discussions, to perform exercises, to participate in a learning community, to communicate with the teacher station 310 or with other student stations 301-303, to receive or perform personalized learning activities, or the like; [0135] teaching, learning and/or assessment activities are monitored, recorded and stored; [0137] the generated reports are used as alternative or additional assessment of students performance, students' knowledge, students classroom behavior [engagement], e.g., a student is responsive to instructions, a student is non-responsive to instructions, or other student parameters), the system comprising:
a student engagement module (Fig. 3, Collaboration Tools 330) configured to be in communication with a plurality of students (Fig. 3, Student Stations 301, 302, 303), one or more electronic learning publishers (Fig. 3, Content Development Tools 323), and one or more learning institutions (Fig. 3, Teacher Station 310; [0128] Content development tools 323 are used, locally or remotely, to generate original or new education content, or to modify or edit or update content items, for example, utilizing templates, editors, step-by-step "wizard" generators, packaging tools, sequencing tools, "wrapping" tools, authoring tools, or the like; [0140] a system 300 may include collaboration tools 330 to allow real-time in-class collaboration, e.g., allowing students to send or submit their accomplishments or their work results to a common space, from which the teacher utilizing the teacher station 310 selects one or more of the submission items for projection, for comparison, or the like). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide methods of adaptive teaching and learning (Meitar, [0003]).

Regarding claim 25, Connor further teaches the system of claim 24, recommending a learning action to take with regard to one or more of the plurality of students, the machine learning module configured to determine the recommended learning action using machine learning ([0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student; [0021] Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on wherein the student engagement module further comprises a result module configured to send an alert to the one or more learning institutions.
Meitar teaches wherein a student engagement module further comprises a result module configured to send an alert to one or more learning institutions ([0133] the teacher station 310 may generate an alert-type message that alerts the teacher to a particular event, e.g., failure or success of a student or a group of students; [0134] For example, system 300 may alert the teacher, using a graphical or textual or audible notification through the teacher station 310, that one or more students or groups of students do not progress at all, or according to pre-defined mile-stones in the learning activity or learning object assigned to them – it is interpreted that a teacher is part of the staff of a learning institution). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to substantially continuously monitor the learning activities of students utilizing the student stations (Meitar, [0150]).

Regarding claim 26, Connor further teaches the system of claim 24, recommending a learning action for the one or more students to take, the machine learning module configured to determine the recommended learning action using machine learning ([0018] The recommendation engine functions to recommend a pattern of teaching plans or strategies, including amounts and types, for a student; [0021] Step S170, which includes recommending a teaching plan for a student of the second group of students, functions to produce recommendations for strategies of teaching or instruction for a student that are associated with student learning gains. The teaching plan recommendation specifies the teaching strategy and the length of time each strategy should be performed and/or at what time the strategy should be performed in a day, week, month, etc.), but is silent on wherein the student engagement module further comprises a result module configured to send an alert to one or more of the plurality of students.
Meitar teaches wherein the student engagement module further comprises a result module configured to send an alert to one or more of the plurality of students ([0151] an alert message may be transferred to the teacher station. Optionally, additional notification may be presented to the student on the relevant student station, e.g., alerting the attention of the student to the determined triggering event. Optionally, additional help or support information, e.g., educational content, explanations, narrations, or the like, may be presented to the student on the relevant student station, either automatically or in response to a pre-approval of the teacher using the teacher station). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to enable students to obtain assistance or help.

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Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
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Regarding claim 27, Connor further teaches the system of claim 24, but is silent on wherein the student engagement module further comprises a result module configured to send an evaluation of the electronic learning material to the one or more electronic learning publishers, the machine learning module configured to determine the evaluation using machine learning.
Meitar teaches a result module configured to send an evaluation of the electronic learning material to the one or more electronic learning publishers, the machine learning module configured to determine the evaluation using machine learning ([0167] store the teacher's newly-created content and/or the teacher's modified content, e.g., reflecting changes that the teacher introduced to system-provided content, and/or imported educational content. Workstation 500 further includes a content publishing module 534, to allow the teacher to manage a publishing process for created and/or modified and/or imported educational content, e.g., transferring or sending altered or created content from the teacher's personal content repository 533 to other teacher stations, to a shared or general repository accessible by other teachers, or the like. Optionally, the publishing process includes review [i.e., evaluation] and approval procedures, e.g., by other teachers, and results in the placing of approved educational content in a publicly accessible repository such that other teachers may use it; [0022] automatically modifying the second portion of the digital learning activity based on performance by the student of the first portion of the digital learning activity; [0034] the lesson planning module is to modify the lesson plan). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to provide methods of adaptive teaching and learning (Meitar, [0003]).

Claim 2 lacks an inventive step under PCT Article 33(3) as being obvious over Connor in view of Meitar, and further in view of Yaski.

Regarding claim 2, Connor further teaches the method of claim 1, and associating each student with the at least one of the identified archetypal learning patterns ([0012] matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern S160; [0020] Step S160 includes matching [i.e., associating] a student profile of a student of the second group of students with an identified learning pattern), but is silent on further comprising modeling each student as a time series path through one or more lessons of the electronic learning system, and correlating the time series path for a particular student with the associated at least one of the identified archetypal learning patterns.
In assessing engagement levels between students and providers (Title), Yaski teaches modeling each student as a time series path through one or more lessons of an electronic learning system, and correlating the time series path for a particular student ([0086] The data analytics and benchmarking 208 provides a cross-academic institution analysis and reporting capability that compares and contrasts the behavior [i.e., pattern] of students at different academic institutions that have implemented the Starfish system 100 [i.e., electronic learning system] and looks at trends over time). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Yaski in order to measuring effectiveness (Yaski, Abstract).

Claims 8-9, 17-18 and 21 lack an inventive step under PCT Article 33(3) as being obvious over Connor in view of Meitar, and further in view of Hochwarth et al. (hereinafter, Hochwarth).

Regarding claim 8, Connor further teaches the method of claim 1, and a plurality of archetypal learning patterns ([0012] obtaining learning patterns from a teaching plan database), but does not disclose one or more macro archetypal learning patterns associated with a student's overall success relative to the electronic learning system; one or more course archetypal learning patterns associated with a single instructional course of the electronic learning system; and one or more micro archetypal learning patterns associated with a particular lesson of the electronic learning system.
Meitar teaches one or more course archetypal learning patterns associated with a single instructional course of an electronic learning system ([0263] The script may modify the path of learning, e.g., the sequence or the educational content elements that are presented or activated, according to a students' behavior or interaction with the educational content [i.e., course]. For example, built-in algorithms may assess or evaluate ["judge"] the students' interaction with the educational content. The assessment or evaluation ["judgment"] of students' interactions by the system is based on predicted patterns of behavior). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to allow production of differential learning processes for different groups or students (Meitar, [0262]).
In presenting a training course to a learner (Abstract), Hochwarth teaches one or more macro archetypal learning patterns and one or more micro archetypal learning patterns ([0028] Learner 104 may access and work through web based courses using the learning interface; [0060] Learning strategies may be created using macro-strategies and micro-strategies; [0034] dynamically adjust the number and sequence of learning objects to the learner's individual learning pattern; [0061] Macro-strategies are used in learning strategies to refer to the coarse-grained structure of a course; [0063] Micro-strategies, implemented by the learning strategies, target the learning progression within a learning unit). Further, wherein the macro/micro learning patterns are associated with specific data would have been a matter of design choice and a practice known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to allow a learner to select from a number of different learning strategies when taking a course.

Regarding claim 9, Connor further teaches the method of claim 1, but is silent on wherein the machine learning comprises a machine learning ensemble comprising a plurality of learned functions from multiple classes, the plurality of learned functions selected from a larger plurality of generated learned functions.
Hochwarth teaches wherein machine learning comprises a machine learning ensemble comprising a plurality of learned functions from multiple classes, the plurality of learned functions selected from a larger plurality of generated learned functions ([0043] Learning units 303 may be assembled using one or more knowledge items 304 to represent a distinct thematically-coherent unit; [0044] Sub-courses 302 may be assembled using other sub-courses 302, learning units 303, and/or knowledge items 304. The sub-course 302 may be used to split up an extensive course into several smaller subordinate courses; [0045] Courses 301 may be assembled from all of the subordinate structural elements including sub-courses 302, learning units 303, and knowledge items 304). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to provide different modules to perform different function within the system.

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INTERNATIONAL SEARCHING AUTHORITY

International application No.
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Supplemental Box

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Regarding claim 17, Connor further teaches the apparatus of claim 13, but is silent on further comprising an ensemble factory module configured to form the machine learning, the machine learning comprising a machine learning ensemble comprising a plurality of learned functions from multiple classes, the ensemble factory module configured to generate a larger plurality of generated learned functions using training data and to select the plurality of learned functions for the machine learning ensemble based on an evaluation of the larger plurality of learned functions using test data.
Hochwarth teaches an ensemble factory module configured to form the machine learning, the machine learning comprising a machine learning ensemble comprising a plurality of learned functions from multiple classes, the ensemble factory module configured to generate a larger plurality of generated learned functions ([0024] "software" may be written or described in any appropriate computer language including C, C++, Java, J#, Visual Basic, assembler; [0028] Learner 104 may access and work through web based courses using the learning interface; [0060] Learning strategies may be created using macro-strategies and micro-strategies; [0034] dynamically adjust the number and sequence of learning objects to the learner's individual learning pattern; [0061] Macro-strategies are used in learning strategies to refer to the coarse-grained structure of a course; [0063] Micro-strategies, implemented by the learning strategies, target the learning progression within a learning unit). Furthermore, using specific data, such as training data, to perform the functions would have been a matter of design choice, which would have been known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to allow a learner to select from a number of different learning strategies when taking a course.

Regarding claim 18, Connor further teaches the apparatus of claim 13, but is silent on wherein the machine learning comprises a plurality of machine learning ensembles, different machine learning ensembles associated with different archetypal learning patterns.
Hochwarth teaches a plurality of machine learning ensembles, and different machine learning ensembles ([0024] "software" may be written or described in any appropriate computer language including C, C++, Java, J#, Visual Basic, assembler; [0028] Learner 104 may access and work through web based courses using the learning interface; [0060] Learning strategies may be created using macro-strategies and micro-strategies; [0034] dynamically adjust the number and sequence of learning objects to the learner's individual learning pattern; [0061] Macro-strategies are used in learning strategies to refer to the coarse-grained structure of a course; [0063] Micro-strategies, implemented by the learning strategies, target the learning progression within a learning unit). Further, wherein the ensembles are associated with different learning patterns would have been a matter of design choice and a practice known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to allow a learner to select from a number of different learning strategies when taking a course.

Regarding claim 21, Connor further teaches the apparatus of claim 13, and a plurality of archetypal learning patterns ([0012] obtaining learning patterns from a teaching plan database), but is silent on wherein the plurality of archetypal learning patterns comprise one or more of a macro archetypal learning pattern associated with an overall result of a student's electronic learning interactions, a course archetypal learning pattern associated with a single electronic course, and a micro archetypal learning pattern associated with a particular electronic lesson.
Meitar teaches a course archetypal learning pattern associated with a single electronic course ([0263] The script may modify the path of learning, e.g., the sequence or the educational content elements that are presented or activated, according to a students' behavior or interaction with the educational content [i.e., course]. For example, built-in algorithms may assess or evaluate ["judge"] the students' interaction with the educational content. The assessment or evaluation ["judgment"] of students' interactions by the system is based on predicted patterns of behavior). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Meitar in order to allow production of differential learning processes for different groups or students (Meitar, [0262]).
Hochwarth teaches one or more of a macro archetypal learning pattern, and a micro archetypal learning pattern ([0024] "software" may be written or described in any appropriate computer language including C, C++, Java, J#, Visual Basic, assembler; [0028] Learner 104 may access and work through web based courses using the learning interface; [0060] Learning strategies may be created using macro-strategies and micro-strategies; [0034] dynamically adjust the number and sequence of learning objects to the learner's individual learning pattern; [0061] Macro-strategies are used in learning strategies to refer to the coarse-grained structure of a course; [0063] Micro-strategies, implemented by the learning strategies, target the learning progression within a learning unit). Further, wherein the macro/micro learning patterns are associated with specific data would have been a matter of design choice and a practice known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Hochwarth in order to allow a learner to select from a number of different learning strategies when taking a course.

Claim 10 lacks an inventive step under PCT Article 33(3) as being obvious over Connor in view of Meitar, and further in view of Landwehr.

Regarding claim 10, Connor further teaches the method of claim 1, but is silent on wherein the received data is collected using a browser extension installed in internet browsers for each of the plurality of students.
In timely learning of vocabulary and word units (Abstract), Landwehr teaches wherein received data is collected using a browser extension installed in internet browsers for each of a plurality of students ([0066] the learning system 100 is read in a web browser online the text of a foreign language news portal, for example via a link of this medium in the media database, the user of the learning system 100 transferred, or parallel to the reading of the message body with a built in browser add-on application of the learning system 100 to select a term in the message body). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Landwehr in order to make sure that the program is installed in the web browser itself, not really the webpage.

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
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Claim 11 lacks an inventive step under PCT Article 33(3) as being obvious over Connor in view of Meitar, and further in view of Atkinson et al. (hereinafter, Atkinson).

Regarding claim 11, Connor further teaches the method of claim 1, wherein received data is collected ([0012] As shown in FIG. 1, a method S100 for recommending a teaching plan for literacy education includes obtaining learning patterns from a teaching plan database that includes: collecting results of a first literacy test of a first group of students S110, gathering teaching plan data S120, collecting results of a second literacy test of a first group of students S130), but is silent on using a proxy server disposed between the plurality of students and the electronic learning system.
In disclosing a computer implemented education system (Title), Atkinson teaches using a proxy server disposed between a plurality of students and an electronic learning system (Col. 3 lns. 59-63, The client computers 101-106 can directly or indirectly communicate with the host system 150 to obtain data stored at the host 150. Indirect communication can include communication through a proxy server).
Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to include the above features in the invention of Connor as taught by Atkinson in order to use the proxy server as a gateway.

Claims 1-27 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

PCT Application No.: PCT-US2014-13028
Date of Search: 02 May 2014

Search History:

Limited Classification Search

The Patent Analyst performed a limited classification search within the following US, IPC, ECLA, or F-Term classification areas:

U.S. Class/Subclass: 273/432; 434/322, 350, 354, 362

IPC (8) Class/Subclass: G09B 3/00, 5/00, 5/14, 7/00, 7/04 (2014.01)

CPC: G09B 5/067, 5/08, 5/125; G06Q 10/101 (2014.02)

(see global patent literature text search below)

Global Patent Literature Text Search

The Patent Analyst performed the following global text search, which was not limited by classification but may or may not have been limited by other criteria:

ORBIT:

23	5	((LEARN+ S PATTERN+) AND MONITOR+)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (G09B-005/067 OR G06Q-010/101 OR G09B-005/08 OR G09B-005/125)/CPC
22	13	((LEARN+ S PATTERN+))/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (G09B-005/067 OR G06Q-010/101 OR G09B-005/08 OR G09B-005/125)/CPC
21	5	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+) AND INTERACT+ AND (ALERT+ OR ALARM+))/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (G09B-005/067 OR G06Q-010/101 OR G09B-005/08 OR G09B-005/125)/CPC
20	33	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+) AND INTERACT+)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (G09B-005/067 OR G06Q-010/101 OR G09B-005/08 OR G09B-005/125)/CPC
19	74	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+))/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (G09B-005/067 OR G06Q-010/101 OR G09B-005/08 OR G09B-005/125)/CPC
18	82	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+) AND (TEACHER+ OR TRAINER+) AND (COMPAR+ OR MATCH+) AND RECOMMEND+ AND (LEARN+ P PATTERN+) AND (MODIF+ OR CHANG+) AND (REAL W TIME+))/BI/CLMS/DESC/ODES/OBJ/ICLM/TX

17	19	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+) AND (TEACHER+ OR TRAINER+) AND (COMPAR+ OR MATCH+) AND RECOMMEND+ AND (LEARN+ P PATTERN+) AND (MODIF+ OR CHANG+) AND (REAL W TIME+))/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (273432 OR 434322 OR 434350 OR 434354 OR 434362)/PCLO
16	45	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+) AND (TEACHER+ OR TRAINER+) AND (COMPAR+ OR MATCH+) AND RECOMMEND+ AND (LEARN+ P PATTERN+) AND (MODIF+ OR CHANG+))/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (273432 OR 434322 OR 434350 OR 434354 OR 434362)/PCLO
15	45	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+) AND (TEACHER+ OR TRAINER+) AND (COMPAR+ OR MATCH+) AND RECOMMEND+ AND (LEARN+ P PATTERN+))/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (273432 OR 434322 OR 434350 OR 434354 OR 434362)/PCLO
14	93	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+) AND (TEACHER+ OR TRAINER+) AND (COMPAR+ OR MATCH+) AND RECOMMEND+ AND PATTERN+)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (273432 OR 434322 OR 434350 OR 434354 OR 434362)/PCLO
13	99	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+) AND (TEACHER+ OR TRAINER+) AND COMPAR+ AND RECOMMEND+ AND FEEDBACK+)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (273432 OR 434322 OR 434350 OR 434354 OR 434362 OR 706927)/PCLO
12	18	(LEARN+ AND (TRAINING OR TEACH+ OR EDUCAT+ OR PEDAGOG+) AND (STUDENT+ OR PUPIL+) AND (TEACHER+ OR TRAINER+) AND COMPAR+ AND RECOMMEND+ AND EVALUAT+ AND PROXY)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (273432 OR 434322 OR 434350 OR 434354 OR 434362 OR 706927)/PCLO
11	31	(LEARN+ AND TEACH+ AND (STUDENT+ OR PUPIL+) AND TEACHER+ AND COMPAR+ AND RECOMMEND+ AND EVALUAT+ AND PROXY)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (G09B-003/00 OR G09B-005/00 OR G09B-005/14 OR G09B-007/00 OR G09B-007/04)/IC
10	353	(LEARN+ AND TEACH+ AND (STUDENT+ OR PUPIL+) AND TEACHER+ AND COMPAR+ AND RECOMMEND+ AND EVALUAT+)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (G09B-003/00 OR G09B-005/00 OR G09B-005/14 OR G09B-007/00 OR G09B-007/04)/IC
9	454	(LEARN+ AND TEACH+ AND (STUDENT+ OR PUPIL+) AND TEACHER+ AND COMPAR+ AND RECOMMEND+)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND

		(G09B-003/00 OR G09B-005/00 OR G09B-005/14 OR G09B-007/00 OR G09B-007/04)/IC
8	2243	(LEARN+ AND TEACH+ AND (STUDENT+ OR PUPIL+) AND TEACHER+ AND COMPAR+)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (G09B-003/00 OR G09B-005/00 OR G09B-005/14 OR G09B-007/00 OR G09B-007/04)/IC
7	3418	(LEARN+ AND TEACH+ AND (STUDENT+ OR PUPIL+) AND TEACHER+)/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (G09B-003/00 OR G09B-005/00 OR G09B-005/14 OR G09B-007/00 OR G09B-007/04)/IC
6	1	(DE102010046439)/PN/XPN
5	3	(US20090186329 OR US20100009330 OR US20090035733)/PN/XPN
4	2	(US20090186329 OR US20100009330)/PN/XPN
3	1	(US20090186329)/PN/XPN
2	1	(PATTERN+ AND TEACH+ AND LEARN+ AND IDENTIF+ AND STUDENT+ AND (COLLECT+ OR GATHER+ OR CAPTUR+ OR MONITOR+))/BI/CLMS/DESC/ODES/OBJ/ICLM/TX AND (US20090186329)/PN/XPN
1	1	(US20100009330)/PN/XPN
		CONNECT ALL

GOOGLE PATENT http://www.google.com/advanced_patent_search

No. of Hits	Text String
56,600	learning engage students
11,200	electronic learning engage students (compare | comparison)
9	electronic learning engage students (compare | comparison) archetypal
1710	learning pattern engage students (compare | comparison) archetypal
2	"learning pattern" archetypal
5820	student learning patterns
2530	student learning patterns monitoring
3020	(learning | pedagogy | teaching) (STUDENT | teacher | pupil) (engage | engagement) patterns (web | website | webpage | browser) (compare | comparison) (notify | alert | notification) (recommend | recommendation) (detect | monitoring | tracking | track)
2810	(learning | pedagogy | teaching) (STUDENT | teacher | pupil | administrator | trainer) (engage | engagement) patterns (web | website | webpage | browser) (compare | comparison | comparing) (notify | alert | notification) (recommend | recommendation) (detect | monitoring | tracking | track)
5070	(learning | pedagogy | teaching | academic) (student | teacher | pupil | trainer) (model | modeling) (engage | engagement) patterns (web | website | webpage | browser) (compare | comparison | comparing) (notify | alert | notification) (recommend | recommendation) (detect | monitoring | tracking | track) p
2	learning "browser add-on" student -2013

PCT Application No.: PCT-US2014-13028
Date of Search: 02 May 2014

Computer Accessed Text Databases Searched

The Patent Analyst searched the following computer accessed text databases:

GOOGLE SCHOLAR http://scholar.google.com/

No. of Hits	Text String
221,000	e-learning teaching students
29,700	e-learning teaching students recommendation
13,000	e-learning teaching students recommendation alert
11,500	e-learning teaching students recommendation alert web
6270	e-learning teaching students recommendation alert web pattern
361	e-learning teaching students recommendation "learning pattern"

Date search was completed 02 May 2014

DF/ TC

Electronic Acknowledgement Receipt

EFS ID:	19070602
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	19-MAY-2014
Filing Date:	29-MAY-2013
Time Stamp:	19:43:29
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS6CoverSheet.pdf	56454 2225dfe09476265ff793dd3fb4248ce18fcf49a9	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS6.pdf	612489 4512e5c9722489a01f1031d3c729df79e7daf07e	no	4
Warnings:					
Information:					
3	Non Patent Literature	3128_2_3pct_ISR.pdf	3439865 007748a810b688c9fb28fe93080ec9f244327f29	no	17
Warnings:					
Information:					
4	Foreign Reference	DE102010046439.pdf	12233393 580a6d3ac10e4e8432faae5f046a7f9222432b38	no	53
Warnings:					
Information:					
			Total Files Size (in bytes):	16342201	

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<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF TRANSMISSION
I hereby certify that this correspondence is being transmitted by either submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 to on May 19, 2014. /Scott C. Hilton/ Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2122 Examiner: Kakali Chaki

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

___ under 37 CFR 1.97(d) together with a:
_____ Statement under 37 CFR 1.97(e), and
_____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

_____ under 37 CFR 1.97(e),

_____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: May 19, 2014
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8209274		2012-06-26	Lin, et al.	
	2	8209271		2012-06-26	Lin, et al.	
	3	8229864		2012-07-24	Lin, et al.	
	4	8250009		2012-08-21	Breckenridge, et al.	
	5	8311967		2012-11-13	Lin, et al.	
	6	8370279		2013-02-05	Lin, et al.	
	7	8527324		2013-09-03	Richter	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20080162487		2008-07-03	Richter	
	2	20090254379		2009-10-08	Adams, et al.	
	3	20100114663		2010-05-06	Casas, et al.	
	4	20100223212		2010-09-02	Manolescu, et al.	
	5	20110137672		2011-06-09	Adams, et al.	
	6	20120004893		2012-01-05	VAIDYANATHAN, et al.	
	7	20120030160		2012-02-02	Ratnam, et al.	
	8	20120191630		2012-06-26	Breckenridge, et al.	
	9	20120191631		2012-07-26	Breckenridge, et al.	
	10	20120284600		2012-11-08	Lin, et al.	

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	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

	11	20120284213		2012-11-08	Lin, et al.	
	12	20120284212		2012-11-08	Lin, et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. 13/870,861, 3128.2.1US1, Office Action, April 8, 2014	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

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☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-04-08
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	18709220
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	08-APR-2014
Filing Date:	29-MAY-2013
Time Stamp:	19:04:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS5coversheet.pdf	46983 8f7ba7a76c87e441b2e9d2c20e590b78cbf955ae	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS5.pdf	612902 483e1e0e19e2ec734dab93392ef3aa610ac4e15e	no	5
Warnings:					
Information:					
3	Non Patent Literature	3128_2_1US1_FinalOfficeAction_04_08_14.pdf	1169825 56df7e6469d30df253c1385f4901034abbbbb7bb	no	29
Warnings:					
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		Total Files Size (in bytes):	1829710		

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New Applications Under 35 U.S.C. 111
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New International Application Filed with the USPTO as a Receiving Office
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/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2122 Examiner: Kakali Chaki

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

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__X__ under 37 CFR 1.97(b), or
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____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

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____ Statement under 37 CFR 1.97(e), and
____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

_____ under 37 CFR 1.97(e),

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__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: April 8, 2014
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13904963
Filing Date	2013-05-29
First Named Inventor	Kelly D. Phillipps
Art Unit	2122
Examiner Name	Kakali Chaki
Attorney Docket Number	3128.2.5

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8209271		2012-06-26	Lin, et al.	
	2	8229864		2012-07-24	Lin, et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20120191631		2012-07-26	Breckenridge, et al.	
	2	20120158624		2012-06-21	Lingenfelder, et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2012151198	WO		2012-11-08	Google, Inc.		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

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NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. PCT/US2013/070358, 3128.2.1pct, International Search Report and Written Opinion, February 28, 2014	☐
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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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CERTIFICATION STATEMENT

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☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-03-10
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
HILTON,SCOTT, C.

8 EAST BROADWAY SUITE 600 SALT LAKE CITY UT 84111 USA

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing *(day/month/year)*	28 February 2014 (28.02.2014)
Applicant's or agent's file reference 3128-2-1PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. **PCT/US2013/070358**	International filing date *(day/month/year)* **15 November 2013 (15.11.2013)**
Applicant **PUREPREDICTIVE, INC.**	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 . 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19months.

For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the PCT Applicant's Guide, National Chapters.

Name and mailing address of the ISA/KR International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea	Authorized officer COMMISSIONER
Facsimile No. 82-42-472-7140	Telephone No. 82-42-481-8755

Form PCT/ISA/220 (July 2010)

* Attention

Copies of the documents cited in the international search report can be searched in the following Korean Intellectual Property Office English website for six months(expire date : **2014.09.02**) from the date of mailing of the international search report.

http://www.kipo.go.kr/en/ => PCT Services => PCT Services

ID : PCT international application number
PW : **T23PM7MA**

Inquiries related to PCT International Search Report or Written Opinion prepared by KIPO as an International Searching Authority can be answered not only by KIPO but also through IPKC (Intellectual Property Korea Center), located in Vienna, VA, which functions as a PCT Help Desk for PCT applicants.

Homepage: http://www.ipkcenter.com

Email: ipkc@ipkcenter.com

Notes to Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
HILTON,SCOTT, C.

8 EAST BROADWAY SUITE 600 SALT LAKE CITY UT
84111 USA

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)*	**28 February 2014 (28.02.2014)**
Applicant's or agent's file reference 3128-2-1PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2013/070358	**15 November 2013 (15.11.2013)**	15 November 2012 (15.11.2012)

International Patent Classification (IPC) or both national classification and IPC
G06F 17/00(2006.01)i

Applicant
PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR	Date of completion of this opinion	Authorized officer
International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea Facsimile No. +82-42-472-7140	27 February 2014 (27.02.2014)	NHO, Ji Myong Telephone No. +82-42-481-8528

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/070358

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of :

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)
   ☐ on paper
   ☐ in electronic form

   b. (time)
   ☐ in the international application as filed.
   ☐ together with the international application in electronic form.
   ☐ subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additioanl copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/070358

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-27	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	1-27	YES
	Claims	NONE	NO
Industrial applicability (IA)	Claims	1-27	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:

D1: US 2012-0191631 A1 (JORDAN M. BRECKENRIDGE et al.) 26 July 2012
D2: US 8,209,271 B1 (WEI-HAO LIN et al.) 26 June 2012
D3: US 2012-0158624 A1 (CHRISTOPH LINGENFELDER et al.) 21 June 2012
D4: WO 2012-151198 A1 (GOOGLE INC.) 08 November 2012
D5: US 8,229,864 B1 (WEI-HAO LIN et al.) 24 July 2012

2.1 Novelty and Inventive Step (PCT Article 33(2) and 33(3))

2.1.1 Independent claim 1 and dependent claims 2-14

The subject matter of **claim 1** differs from D1 in that the apparatus of claim 1 comprises a predictive compiler module configured to form a predictive ensemble, the predictive ensemble comprising a subset of multiple learned functions from the plurality of learned functions, the multiple learned functions selected and combined based on evaluation metadata for the plurality of learned functions, the predictive ensemble comprising a rule set synthesized from the evaluation metadata to direct data through the multiple learned functions. In addition, such different features are not disclosed in any one of the other available documents D2-D5, nor are they obvious to a person skilled in the art by documents D1-D5, taken alone or in combination. Therefore, claim 1 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 2-14 are directly or indirectly dependent on claim 1. Therefore, claims 2-14 meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Continued on Supplemental Box

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of : Box No. V

2.1.2 Independent claim 15 and dependent claims 16-17

The subject matter of **claim 15** differs from D1 in that the method of claim 1 comprises pseudo-randomly generating a plurality of learned functions based on training data without prior knowledge regarding suitability of the generated learned functions for the training data, the training data received for forming a predictive ensemble customized for the training data; evaluating the plurality of learned functions using test data to generate evaluation metadata; and forming the predictive ensemble comprising a subset of multiple learned functions from the plurality of learned functions, the subset of multiple learned functions selected and combined based on the evaluation metadata, the predictive ensemble comprising a rule set synthesized from the evaluation metadata to direct workload data through the multiple learned functions. In addition, such different features are not disclosed in any one of the other available documents D2-D5, nor are they obvious to a person skilled in the art by documents D1-D5, taken alone or in combination. Therefore, claim 15 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 16-17 are dependent on claim 15. Therefore, claims 16-17 meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

2.1.3 Independent claim 18 and dependent claims 19-23

The subject matter of **claim 18** differs from D1 in that the operations performed by the program code stored on the storage medium comprised in the computer program product of claim 18 comprises forming a predictive ensemble, the predictive ensemble comprising at least two learned functions from a plurality of learned functions, the at least two learned functions using a selected subset of features, the at least two learned functions selected and combined based on the evaluation metadata, the predictive ensemble comprising a rule set synthesized from the evaluation metadata to direct data through the at least two learned functions. In addition, such different features are not disclosed in any one of the other available documents D2-D5, nor are they obvious to a person skilled in the art by documents D1-D5, taken alone or in combination. Therefore, claim 18 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 19-23 are directly or indirectly dependent on claim 18. Therefore, claims 19-23 meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Continued on The Next Page

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of : Previous Page

2.1.4 Independent claim 24 and dependent claims 25-27

The subject matter of **claim 24** differs from D1 in that the predictive analytics ensemble of claim 24 comprises multiple learned functions synthesized from a larger plurality of learned functions, the multiple learned functions selected and combined based on evaluation metadata for the larger plurality of learned functions; a metadata rule set synthesized from the evaluation metadata for the plurality of learned functions for directing data through the multiple learned functions to produce a result; and an orchestration module configured to direct the data through the multiple learned functions based on the synthesized metadata rule set to produce the result. In addition, such different features are not disclosed in any one of the other available documents D2-D5, nor are they obvious to a person skilled in the art by documents D1-D5, taken alone or in combination. Therefore, claim 24 meets the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

Claims 25-27 are directly or indirectly dependent on claim 24. Therefore, claims 25-27 meet the requirements of PCT Article 33(2) and (3) with respect to novelty and inventive step.

2.2 Industrial Applicability (PCT Article 33(4))

Claims 1-27 are industrially applicable under PCT Article 33(4).

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 3128-2-1PCT	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. **PCT/US2013/070358**	International filing date *(day/month/year)* **15 November 2013 (15.11.2013)**	(Earliest) Priority Date *(day/month/year)* 15 November 2012 (15.11.2012)
Applicant **PUREPREDICTIVE, INC.**		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language**, the international search was carried out on the basis of:
      ☒ the international application in the language in which it was filed
      ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.
2. ☐ **Certain claims were found unsearchable** (See Box No. II)
3. ☐ **Unity of invention is lacking** (See Box No. III)
4. With regard to the **title,**
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:
5. With regard to the **abstract,**
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. With regard to the drawings,
   a. the figure of the **drawings** to be published with the abstract is Figure No. 4
      ☒ as suggested by the applicant.
      ☐ as selected by this Authority, because the applicant failed to suggest a figure.
      ☐ as selected by this Authority, because this figure better characterizes the invention.
   b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/070358

A. CLASSIFICATION OF SUBJECT MATTER

G06F 17/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F 17/00; G06F 17/20; G06N 99/00; G06N 5/00; G06F 15/18

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: predictive analytics, training data, learned function, evaluation, metadata, predictive ensemble, and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2012-0191631 A1 (JORDAN M. BRECKENRIDGE et al.) 26 July 2012 See paragraphs [0002]-[0010], [0021]-[0032], [0035]-[0048], [0064]-[0071], and [0083]-[0096]; and figures 1-5.	1-27
A	US 8,209,271 B1 (WEI-HAO LIN et al.) 26 June 2012 See column 1, line 14 - column 2, line 3; column 3, line 19 - column 5, line 67; and figures 1-3.	1-27
A	US 2012-0158624 A1 (CHRISTOPH LINGENFELDER et al.) 21 June 2012 See paragraphs [0003]-[0005], [0013]-[0016], [0027], and [0037]-[0038]; and figures 1a-1b.	1-27
A	WO 2012-151198 A1 (GOOGLE INC.) 08 November 2012 See paragraphs [0003]-[0008], [0011]-[0024], [0030]-[0033], [0046]-[0050], [0060]-[0065], and [0087]-[0088]; and figures 1-5.	1-27
A	US 8,229,864 B1 (WEI-HAO LIN et al.) 24 July 2012 See column 1, line 14 - column 2, line 35; column 5, line 64 - column 6, line 7; column 6, line 55 - column 7, line 35; and figures 2-5.	1-27

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 February 2014 (27.02.2014)	**28 February 2014 (28.02.2014)**

Name and mailing address of the ISA/KR	Authorized officer
International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea	NHO, Ji Myong
Facsimile No. +82-42-472-7140	Telephone No. +82-42-481-8528

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/US2013/070358

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2012-0191631 A1	26/07/2012	US 2012-0191630 A1	26/07/2012
		US 8533222 B2	10/09/2013
		US 8595154 B2	26/11/2013
		WO 2012-103290 A1	02/08/2012
US 8209271 B1	26/06/2012	None	
US 2012-0158624 A1	21/06/2012	CN 103262069 A	21/08/2013
		DE 112011104487 T5	17/10/2013
		WO 2012-084320 A2	28/06/2012
		WO 2012-084320 A3	10/01/2013
WO 2012-151198 A1	08/11/2012	AU 2012-250923 A1	21/11/2013
		US 2012-0284212 A1	08/11/2012
		US 8533224 B2	10/09/2013
US 8229864 B1	24/07/2012	AU 2012-253988 A1	21/11/2013
		US 2012-284600 A1	08/11/2012
		WO 2012-154439 A1	15/11/2012

Electronic Acknowledgement Receipt

EFS ID:	18424921
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	11-MAR-2014
Filing Date:	29-MAY-2013
Time Stamp:	03:01:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS4Coversheet.pdf	56450 99691c36a485a43dde1781be3880b90574 89d31f	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS4.pdf	612433 5e36f464e5768b8e6f31bf3697ba35d533aabe0d	no	4
Warnings:					
Information:					
3	Foreign Reference	WO2012151198A1.pdf	9686603 394840bfe8ec54a09d9556a8672afef14d089a5d	no	69
Warnings:					
Information:					
4	Non Patent Literature	3128_2_1pct_ISR.pdf	1479973 1e6b3891e729a4b45cc4419bc1f36ef21702c031	no	10
Warnings:					
Information:					
			Total Files Size (in bytes):	11835459	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by either submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 to on March 10, 2014.

/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2122 Examiner: Kakali Chaki

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

___ under 37 CFR 1.97(d) together with a:
____ Statement under 37 CFR 1.97(e), and
____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

_____ under 37 CFR 1.97(e),

_____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: March 10, 2014
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	13904963
Filing Date	2013-05-29
First Named Inventor	Kelly D. Phillipps
Art Unit	2122
Examiner Name	Kakali Chaki
Attorney Docket Number	3128.2.5

U.S.PATENTS Remove

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090327172		2009-12-31	Liu, et al.	
	2	20040059966		2004-03-25	Chan, et al.	
	3	20050132052		2005-06-16	Uttamchandani, et al.	
	4	20050228789		2005-10-13	Fawcett, et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

	1							☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. PCT/US2013/077236, 3128.2.2pct, International Search Report and Written Opinion, February 24, 2014	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13904963
	Filing Date	2013-05-29
	First Named Inventor	Kelly D. Phillipps
	Art Unit	2122
	Examiner Name	Kakali Chaki
	Attorney Docket Number	3128.2.5

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2014-03-06
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
HILTON, SCOTT C.

8 EAST BROADWAY SUITE 600 SALT LAKE CITY UT 84111 USA

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing *(day/month/year)*	24 February 2014 (24.02.2014)
Applicant's or agent's file reference 3128-2-2PCT	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. **PCT/US2013/077236**	International filing date *(day/month/year)* **20 December 2013 (20.12.2013)**
Applicant **PUREPREDICTIVE, INC.**	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:

   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 . 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19months.

For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the PCT Applicant's Guide, National Chapters.

Name and mailing address of the ISA/KR International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer COMMISSIONER Telephone No. 82-42-481-8755

Form PCT/ISA/220 (July 2010)

* Attention

Copies of the documents cited in the international search report can be searched in the following Korean Intellectual Property Office English website for six months(expire date : **2014.08.25**) from the date of mailing of the international search report.

http://www.kipo.go.kr/en/ => PCT Services => PCT Services

ID : PCT international application number
PW : **2P3S649H**

Inquiries related to PCT International Search Report or Written Opinion prepared by KIPO as an International Searching Authority can be answered not only by KIPO but also through IPKC (Intellectual Property Korea Center), located in Vienna, VA, which functions as a PCT Help Desk for PCT applicants.

Homepage: http://www.ipkcenter.com

Email: ipkc@ipkcenter.com

Notes to Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 3128-2-2PCT	FOR FURTHER ACTION	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. **PCT/US2013/077236**	International filing date *(day/month/year)* **20 December 2013 (20.12.2013)**	(Earliest) Priority Date *(day/month/year)* 21 December 2012 (21.12.2012)
Applicant **PUREPREDICTIVE, INC.**		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**
   a. With regard to the **language**, the international search was carried out on the basis of :
      ☒ the international application in the language in which it was filed
      ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
   b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).
   c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.
2. ☐ **Certain claims were found unsearchable** (See Box No. II)
3. ☐ **Unity of invention is lacking** (See Box No. III)
4. With regard to the **title,**
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:
5. With regard to the **abstract,**
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. With regard to the drawings,
   a. the figure of the **drawings** to be published with the abstract is Figure No. 1
      ☒ as suggested by the applicant.
      ☐ as selected by this Authority, because the applicant failed to suggest a figure.
      ☐ as selected by this Authority, because this figure better characterizes the invention.
   b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/077236

A. CLASSIFICATION OF SUBJECT MATTER

G06F 15/18(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F 15/18; H04L 1/22; G06F 15/173; G06F 17/30; H03K 19/003; G06N 5/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: system, management, machine, learning, state.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2009-0327172 A1 (LIU YAN et al.) 31 December 2009 See abstract, paragraphs [0018]-[0046], claims 1,10,16 and figures 1,2A,2B.	1-30
Y	US 2004-0059966 A1 (HOI YEUNG CHAN et al.) 25 March 2004 See abstract, paragraphs [0036]-[0044], claims 1,22,43 and figures 6,7.	1-30
A	US 2005-0132052 A1 (SANDEEP UTTAMCHANDANI et al.) 16 June 2005 See abstract, paragraphs [0087]-[0099], claim 1 and figure 7.	1-30
A	US 2005-0228789 A1 (TOM FAWCETT et al.) 13 October 2005 See abstract, paragraphs [0010]-[0044], claim 1 and figure 1.	1-30

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 February 2014 (21.02.2014)	**24 February 2014 (24.02.2014)**

Name and mailing address of the ISA/KR
International Application Division
Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea
Facsimile No. +82-42-472-7140

Authorized officer
Park, Sung Cheol
Telephone No. +82-42-481-5696

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/US2013/077236

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009-0327172 A1	31/12/2009	None	
US 2004-0059966 A1	25/03/2004	AU 2003-252077 A1	08/04/2004
		CN 1317678 C	23/05/2007
		CN 1317678 C0	23/05/2007
		CN 1682243 A	12/10/2005
		JP 2006-500654 A	05/01/2006
		KR 10-0714157 B1	07/05/2007
		KR 10-2005-0037606 A	22/04/2005
		TW I243314 B	11/11/2005
		US 7194445 B2	20/03/2007
		WO 2004-027705 A1	01/04/2004
US 2005-0132052 A1	16/06/2005	CN 1894892 A	10/01/2007
		CN 1894892 B	11/05/2011
		CN 1894892 C0	10/01/2007
		EP 1700422 A1	13/09/2006
		JP 04617317 B2	26/01/2011
		JP 2007-521579 A	02/08/2007
		KR 10-0985624 B1	05/10/2010
		KR 10-2006-0126494 A	07/12/2006
		US 2010-0205133 A1	12/08/2010
		US 7734561 B2	08/06/2010
		US 8352593 B2	08/01/2013
		WO 2005-060159 A1	30/06/2005
US 2005-0228789 A1	13/10/2005	US 7640217 B2	29/12/2009

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
HILTON, SCOTT C.

8 EAST BROADWAY SUITE 600 SALT LAKE CITY UT
84111 USA

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing *(day/month/year)*	**24 February 2014 (24.02.2014)**
Applicant's or agent's file reference 3128-2-2PCT	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2013/077236	**20 December 2013 (20.12.2013)**	21 December 2012 (21.12.2012)

International Patent Classification (IPC) or both national classification and IPC

G06F 15/18(2006.01)i

Applicant

PUREPREDICTIVE, INC.

1. This opinion contains indications relating to the following items:

- [x] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [x] Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR	Date of completion of this opinion	Authorized officer
International Application Division Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea Facsimile No. +82-42-472-7140	21 February 2014 (21.02.2014)	Park, Sung Cheol Telephone No. +82-42-481-5696

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/077236

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of :

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)
   - ☐ on paper
   - ☐ in electronic form

   b. (time)
   - ☐ in the international application as filed.
   - ☐ together with the international application in electronic form.
   - ☐ subsequently to this Authority for the purposes of search.

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additioanl copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2013/077236

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-30	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-30	NO
Industrial applicability (IA)	Claims	1-30	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:
D1: US 2009-0327172 A1 (LIU YAN et al.) 31 December 2009
D2: US 2004-0059966 A1 (HOI YEUNG CHAN et al.) 25 March 2004
D3: US 2005-0132052 A1 (SANDEEP UTTAMCHANDANI et al.) 16 June 2005
D4: US 2005-0228789 A1 (TOM FAWCETT et al.) 13 October 2005

A. Novelty and Inventive Step

1. Claims 1-7

1.1 Independent Claim 1

D1, which is considered to represent the most relevant state of the art, discloses a method for selection of a machine learning algorithm comprising: receiving as an input a state of at least one problem and at least one context associated with the problem; selecting a machine learning algorithm based on the problem and context of the problem that have been received; outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 1 in receiving user information and systems management data. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 1 would have been obvious over D1 in view of D2. Therefore, claim 1 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

1.2 Dependent Claims 2-7

Continued on Supplemental Box

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of: Box No. V

Claims 2-7 are dependent on claim 1.
The additional feature of claim 2 is identical to knowledge base of rules in D2.
The additional feature of claim 3 is identical to performance measures in D2.
The additional features of claims 4,5 are identical to a status of the computing environment in D2.
The additional feature of claim 6 is identical to performing reinforcement learning with respect to selecting a machine learning algorithm in D1.
The additional feature of claim 7 is identical to event logs in D2.

Therefore, claims 2-7 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

2. Claims 8-11

2.1 Independent Claim 8

D1, which is considered to represent the most relevant state of the art, discloses a method for selection of a machine learning algorithm comprising: receiving as an input a state of at least one problem and at least one context associated with the problem; selecting a machine learning algorithm based on the problem and context of the problem that have been received; outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 8 in receiving user information and incident management data. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 8 would have been obvious over D1 in view of D2. Therefore, claim 8 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

2.2 Dependent Claims 9-11

Claims 9-11 are dependent on claim 8.
The additional feature of claim 9 is identical to event logs in D2.

Continued on The Next Page

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of: Previous Page

The additional feature of claim 10 is identical to awarding a reinforcement value to a selection of at least machine learning algorithm in D1.
The additional feature of claim 11 is identical to performing reinforcement learning with respect to selecting a machine learning algorithm in D1.

Therefore, claims 9-11 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

3. Claims 12-15

3.1 Independent Claim 12

D1, which is considered to represent the most relevant state of the art, discloses a system for selecting a machine learning algorithm comprising: receiving as an input a state of at least one problem and at least one context associated with the problem; selecting a machine learning algorithm based on the problem and context of the problem that have been received; outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 12 in receiving systems management data. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 12 would have been obvious over D1 in view of D2. Therefore, claim 12 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

3.2 Dependent Claims 13-15

Claims 13-15 are dependent on claim 12.
The additional features of claims 13-15 are identical to performing reinforcement learning with respect to selecting a machine learning algorithm and awarding a reinforcement value to a selection of at least machine learning algorithm in D1.

Therefore, claims 13-15 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

Continued on The Next Page

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of: Previous Page

4. Claims 16-24

4.1 Independent Claim 16

D1, which is considered to represent the most relevant state of the art, discloses a method for selection of a machine learning algorithm comprising: receiving as an input a state of at least one problem and at least one context associated with the problem; selecting a machine learning algorithm based on the problem and context of the problem that have been received; outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 16 in identifying a business activity based on input from a user. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 16 would have been obvious over D1 in view of D2. Therefore, claim 16 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

4.2 Dependent Claims 17-24

Claims 17-24 are dependent on claim 16.
The additional features of claims 17-20 are identical to performing reinforcement learning with respect to selecting a machine learning algorithm and awarding a reinforcement value to a selection of at least machine learning algorithm in D1.
The additional features of claims 21-24 are identical to performance measures in D2.

Therefore, claims 17-24 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

5. Claims 25-30

5.1 Independent Claim 25

D1, which is considered to represent the most relevant state of the art, discloses a method for selection of a machine learning algorithm comprising: receiving as an

Continued on The Next Page

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of: Previous Page

input a state of at least one problem and at least one context associated with the problem: selecting a machine learning algorithm based on the problem and context of the problem that have been received: outputting the machine learning algorithm that has been selected to an autonomic controller(See paragraphs [0018]-[0046], figures 1,2A,2B). D1 differs from claim 25 in receiving user information and systems management data. However, it is well known in D2 that receiving information regarding a status of the computing environment(See paragraphs [0036]-[0044], figures 6,7). Accordingly, claim 25 would have been obvious over D1 in view of D2. Therefore, claim 25 is novel under PCT Article 33(2) but lacks an inventive step under PCT Article 33(3).

5.2 Dependent Claims 26-30

Claims 26-30 are dependent on claim 25.
The additional features of claims 26-28 are identical to awarding a reinforcement value to a selection of at least machine learning algorithm in D1.
The additional features of claims 29 are identical to a status of the computing environment in D2.
The additional feature of claim 30 is identical to performing reinforcement learning with respect to selecting a machine learning algorithm in D1.

Therefore, claims 26-30 are novel under PCT Article 33(2) but lack an inventive step under PCT Article 33(3).

B. Industrial Applicability

Claims 1-30 have industrial applicability and meet the requirement of PCT Article 33(4).

Electronic Acknowledgement Receipt

EFS ID:	18388014
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	06-MAR-2014
Filing Date:	29-MAY-2013
Time Stamp:	14:56:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS3Coversheet.pdf	56655 8b822a2d48b74fb09892a95ab8a8334f1ed40aaf	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS3.pdf	612402 fbb282471415dcf299958c311688d98d58afc52d	no	4
Warnings:					
Information:					
3	Non Patent Literature	3128_2_2pct_ISR.pdf	1708207 1e91fca25b1500c579b49f3458b778207ea57ed8	no	12
Warnings:					
Information:					
		Total Files Size (in bytes):	2377264		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by either submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 to on March 6, 2014.

/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: May 29, 2013 Title: USER INTERFACE FOR MACHINE LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2122 Examiner: Kakali Chaki

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

___ under 37 CFR 1.97(d) together with a:
____ Statement under 37 CFR 1.97(e), and
____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

_____ under 37 CFR 1.97(e),

_____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: March 6, 2014
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

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/Scott C. Hilton/
Attorney for Applicants

PATENT
Docket No. 3128.2.5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Kelly D. Phillipps	
Serial No.:	13/904,963	
Filed:	May 29, 2013	Group Art Unit: 2122
For:	USER INTERFACE FOR MACHINE LEARNING	
Examiner:	Kakali Chaki	

SUPPLEMENTAL APPLICATION DATA SHEET FOR NAME CHANGE

The Applicant for the present Application, CloudVu, Inc., has changed its name to PurePredictive, Inc. The name change document has been recorded with the Assignment Services Division of the Office of Public Records. Accordingly, Applicant submits the accompanying Supplemental Application Data Sheet, changing the name of the Applicant to PurePredictive, Inc.

Respectfully submitted,

/Scott C. Hilton/

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Kunzler Law Group
Date: January 2, 2014
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646 Fax (801) 531-1929

PTO/AIA/14 (03-13)
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Supplemental Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	13/904,963
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Kelly	D.	Phillipps	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Salt Lake City	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	9100 South 500 West		
Address 2			
City	Sandy	**State/Province**	UT
Postal Code	84070	**Country**	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Richard	W.	Wellman	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Park City	State/Province	UT	Country of Residence	US

Mailing Address of Inventor:

Address 1	9100 South 500 West		
Address 2			
City	Sandy	**State/Province**	UT
Postal Code	84070	**Country**	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

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Supplemental Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	13/904,963
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

☐ An Address is being provided for the correspondence Information of this application.			
Customer Number	36491		
Email Address	docket@kunzlerlaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	USER INTERFACE FOR MACHINE LEARNING		
Attorney Docket Number	3128.2.5	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter			
Total Number of Drawing Sheets (if any)	14	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	36491		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

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Supplemental Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	13/904,963
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date o f filing this Authorization.

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Supplemental Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	13/904,963
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◯ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name: ~~CloudVu, Inc.~~ PurePredictive, Inc.

Mailing Address Information For Applicant:

Address 1	9100 South 500 West		
Address 2			
City	Sandy	**State/Province**	UT
Country	US	Postal Code	84070
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Supplemental Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	13/904,963
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

Assignee 1

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Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

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Signature:

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Signature	/Scott C. Hilton/			Date (YYYY-MM-DD)	2013-05-29
First Name	Scott	Last Name	Hilton	Registration Number	66011

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This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Co o p eration Treaty.

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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Electronic Acknowledgement Receipt

EFS ID:	17797168
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	03-JAN-2014
Filing Date:	29-MAY-2013
Time Stamp:	15:34:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_TransmittalLetter.pdf	40769 26bc38c4ccd9d894caee4aa72282e86c0e772968	no	1

Warnings:

Information:

2	Application Data Sheet	3128_2_5_SuppADS.pdf	134742 6562159a57718eb8f929a84f3807e53250bd8a1d	no	6

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National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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(Not for submission under 37 CFR 1.99)

Application Number	13749618
Filing Date	2013-01-24
First Named Inventor	Richard W. Wellman
Art Unit	3715
Examiner Name	Xuan Marian Thai
Attorney Docket Number	3128.2.3

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	8209271		2012-06-26	Lin, et al.	
	2	8209274		2012-06-26	Lin, et al.	
	3	8229864		2012-07-24	Lin, et al.	
	4	8250009		2012-08-21	Breckenridge, et al.	
	5	8311967		2012-11-13	Lin, et al.	
	6	8370279		2013-02-05	Lin, et al.	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13749618
	Filing Date	2013-01-24
	First Named Inventor	Richard W. Wellman
	Art Unit	3715
	Examiner Name	Xuan Marian Thai
	Attorney Docket Number	3128.2.3

	1	20090254379		2009-10-08	Adams, et al.	
	2	20100114663		2010-05-06	Casas, et al.	
	3	20100223212		2010-09-02	Manolescu, et al.	
	4	20110137672		2011-06-09	Adams, et al.	
	5	20120004893		2012-01-05	Vaidyanathan, et al.	
	6	20120030160		2012-02-02	Ratnam, et al.	
	7	20120191630		2012-07-26	Breckenridge, et al.	
	8	20120191631		2012-07-26	Breckenridge, et al.	
	9	20120284213		2012-11-08	Lin, et al.	
	10	20120284600		2012-11-08	Lin, et al.	
	11	20120284212		2012-11-08	Lin, et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13749618
	Filing Date	2013-01-24
	First Named Inventor	Richard W. Wellman
	Art Unit	3715
	Examiner Name	Xuan Marian Thai
	Attorney Docket Number	3128.2.3

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Application No. 13/870,861, 3128.2.1US1, Office Action, September 12, 2013	☐
	2	KOLTER, J. ZICO, et al., "Dynamic Weighted Majority: An Ensemble Method for Drifting Concepts", Journal of Machine Learning Research 8, 2007, pgs. 2755-2790	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	13749618
	Filing Date	2013-01-24
	First Named Inventor	Richard W. Wellman
	Art Unit	3715
	Examiner Name	Xuan Marian Thai
	Attorney Docket Number	3128.2.3

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2013-09-19
Name/Print	Scott C. Hilton	Registration Number	66011

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	16906145
Application Number:	13904963
International Application Number:	
Confirmation Number:	6149
Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Customer Number:	36491
Filer:	Scott C. Hilton
Filer Authorized By:	
Attorney Docket Number:	3128.2.5
Receipt Date:	19-SEP-2013
Filing Date:	29-MAY-2013
Time Stamp:	18:41:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	3128_2_5_IDS2Coversheet.pdf	56901 9cb9add2c78305f38003f53b1761286e8d4dd91c	no	2
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS2.pdf	613182 b21e537af56302838bd668ef5ac8a9467e4f22c2	no	5
Warnings:					
Information:					
3	Non Patent Literature	3128_2_1US1_OfficeAction_09_12_13.pdf	1723297 79f5b607db4be95dd6994d37957d6dd6f8a86574	no	16
Warnings:					
Information:					
4	Non Patent Literature	kolter_dynamic.pdf	490168 dd8687ee1ff06b8a34dca261020034f83861031b	no	36
Warnings:					
Information:					
			Total Files Size (in bytes):	2883548	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by either submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 to on September 19, 2013.

/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: 13/904,963 Filed: 2013-05-29 Title: USER INTERFACE FOR MACHING LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: 2129 Examiner: Not Known

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

___ under 37 CFR 1.97(d) together with a:
____ Statement under 37 CFR 1.97(e), and
____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

_____ under 37 CFR 1.97(e),

_____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: September 19, 2013
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/904,963

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	26 minus 20 =	* 6	x 40 =	240	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	970		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)	OR	RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/904,963	05/29/2013	2129	970	3128.2.5	26	3

CONFIRMATION NO. 6149

36491
Kunzler Law Group
8 EAST BROADWAY
SUITE 600
SALT LAKE CITY, UT 84111

FILING RECEIPT



Date Mailed: 06/24/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Kelly D. Phillipps, Salt Lake City, UT;
Richard W. Wellman, Park City, UT;

Applicant(s)

CloudVu, Inc., Sandy, UT

Power of Attorney: The patent practitioners associated with Customer Number 36491

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 06/17/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/904,963**
Projected Publication Date: 12/04/2014
Non-Publication Request: No
Early Publication Request: No

**** SMALL ENTITY ****
Title

USER INTERFACE FOR MACHINE LEARNING

Preliminary Class

706

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/904,963	05/29/2013	Kelly D. Phillipps	3128.2.5

CONFIRMATION NO. 6149

36491
Kunzler Law Group
8 EAST BROADWAY
SUITE 600
SALT LAKE CITY, UT 84111

POA ACCEPTANCE LETTER

OC000000062032986

Date Mailed: 06/24/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/29/2013.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/mpaulos/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

KUNZLER LAW GROUP DOCKET NUMBER: **3128.2.5**

DECLARATION (37 C.F.R. 1.63) FOR UTILITY PATENT APPLICATION USING AN APPLICATION DATA SHEET (37 C.F.R. 1.76) AND ASSIGNMENT

Title of Invention: **USER INTERFACE FOR MACHINE LEARNING**

As a below named inventor, I hereby declare that:

This declaration is directed to the attached application, or (if following box is checked):

[ ] United States application or PCT international application number _____ filed on _____.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I have reviewed and understand the contents of the application, including the claims.

I am aware of the duty to disclose to the United States Patent and Trademark Office all information known to me to be material to patentability as defined in 37 CFR Section 1.56.

Whereas, the undersigned inventor(s) has/have made certain inventions, improvements, and discoveries (herein referred to as the "Invention") disclosed in the above-identified patent application and further identified by the Kunzler Law Group Docket Number provided above in the header of this document;

Whereas, CloudVu, Inc., a corporation of Utah having a place of business at 9100 South 500 West, Sandy, Utah, 84070, (herein referred to as "CloudVu"), desires to acquire, and each undersigned inventor desires to grant to CloudVu the entire worldwide right, title, and interest in and to the Invention and in and to any and all patent applications and patents directed thereto;

Now, therefore, for good and valuable consideration, the receipt and sufficiency thereof being hereby acknowledged, each undersigned inventor ("ASSIGNOR") hereby sells or has sold, assigns or has assigned, and otherwise transfers or has transferred to CloudVu (the "ASSIGNEE"), its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the Invention, the above-identified United States patent application, and any and all other patent applications and patents for the Invention which may be applied for or granted therefor in the United States and in all foreign countries and jurisdictions, including all divisions, continuations, reissues, reexaminations, renewals, extensions, counterparts, substitutes, and extensions thereof, and all rights of priority resulting from the filing of such applications and granting of such patents. In addition, each undersigned inventor hereby authorizes and requests the Director of the United States Patent and Trademark Office to issue any United States Patent, and foreign patent authorities to issue any foreign patent, granted for the Invention, to CloudVu, its successors, legal representatives, and assigns, the entire worldwide right, title, and interest in and to the same to be held and enjoyed by CloudVu, its successors, legal representatives, and assigns to the full end of the terms for which any and all such patents may be granted, as fully and entirely as would have been held and enjoyed by the undersigned had this Assignment not been made; and each undersigned inventor agrees to execute any and all documents and instruments and perform all lawful acts reasonably related to recording this Assignment or perfecting title to the Invention and all related patents and applications, in CloudVu, its successors, legal representatives, and assigns, whenever requested by CloudVu, its successors, legal representatives, or assigns.

Each undersigned inventor acknowledges their prior and ongoing obligations to sell, assign, and transfer the rights under this Assignment to CloudVu and is unaware of any reason why they may not have the full and unencumbered right to sell, assign, and transfer the rights hereby sold, assigned, and transferred, and has not executed, and will not execute, any document or instrument in conflict herewith. Each undersigned inventor also hereby grants CloudVu, its successors, legal representatives, and assigns, the right to insert in this Assignment any further identification (including, but not limited to, patent Application Number) which may be necessary or desirable for recordation of this Assignment. This Assignment is governed by the substantive laws of the State of Utah, and any disputes will be resolved in a Utah state court or federal court sited in Utah.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

(1) Legal Name of Inventor: **KELLY D. PHILLIPPS**

Signature: _____ Date: 5/24/13

(2) Legal Name of Inventor: **RICHARD W. WELLMAN**

Signature: _____ Date: 5/24/13

Assignee: _____ Date: 5·24·13
CloudVu, Inc.

PTO/AIA/14 (03-13)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Kelly	D.	Phillipps	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Salt Lake City	State/Province	UT	Country of Residence i	US

Mailing Address of Inventor:

Address 1	9100 South 500 West		
Address 2			
City	Sandy	State/Province	UT
Postal Code	84070	Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Richard	W.	Wellman	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Park City	State/Province	UT	Country of Residence i	US

Mailing Address of Inventor:

Address 1	9100 South 500 West		
Address 2			
City	Sandy	State/Province	UT
Postal Code	84070	Country i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

☐ **An Address is being provided for the correspondence Information of this application.**			
Customer Number	36491		
Email Address	docket@kunzlerlaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	USER INTERFACE FOR MACHINE LEARNING		
Attorney Docket Number	3128.2.5	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter			
Total Number of Drawing Sheets (if any)	14	**Suggested Figure for Publication (if any)**	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	36491		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) [i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code [i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◯ Assignee	◯ Legal Representative under 35 U.S.C. 117	◯ Joint Inventor
◯ Person to whom the inventor is obligated to assign.	◯ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. ☒

Organization Name	CloudVu, Inc.		
Mailing Address Information:			
Address 1	9100 South 500 West		
Address 2			
City	Sandy	**State/Province**	UT
Country [i]	US	Postal Code	84070
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	3128.2.5
	Application Number	
Title of Invention	USER INTERFACE FOR MACHINE LEARNING	

Assignee 1

Complete this section only if non-applicant assignee information is desired to be included on the patent application publication in accordance with 37 CFR 1.215(b). Do not include in this section an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest), as the patent application publication will include the name of the applicant(s).

Remove

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications

Signature	/Scott C. Hilton/			Date (YYYY-MM-DD)	2013-05-29
First Name	Scott	Last Name	Hilton	Registration Number	66011

Additional Signature may be generated within this form by selecting the Add button. Add

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc Code: PA..

Document Description: Power of Attorney

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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B or equivalent) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.

Application Number	
Filing Date	
First Named Inventor	Kelly D. Phillipps
Title	User Interface for Machine Learning
Art Unit	
Examiner Name	
Attorney Docket Number	3128.2.5

SIGNATURE of Applicant or Patent Practitioner

Signature	/Scott C. Hilton/	Date	May 29, 2013
Name	Scott C. Hilton	Telephone	801-994-4646
Registration Number	66011		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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Document Description: Power of Attorney

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POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in the attached transmittal letter.

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

36491

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

Name	Registration Number	Name	Registration Number

Please recognize or change the correspondence address for the application identified in the attached transmittal letter to:

☒ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant:

☐ Inventor or Joint Inventor

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor

☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document)

SIGNATURE of Applicant for Patent

Signature		Date	1-28-13
Name	Alan Walbeck	Telephone	801-895-7767
Title and Company	CEO, CloudVu, Inc.		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms for more than one signature, see below *.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted by either submission using the EFS WEB submission system, fax to the U.S. Patent and Trademark office to fax number 571-273-8300, or is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 to on May 29, 2013.

/Scott C. Hilton/
Attorney for Applicant

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Kelly D. Phillipps Serial No.: Filed: Title: USER INTERFACE FOR MACHING LEARNING Attorney Docket No.: *3128.2.5*	Group Art Unit: Examiner:

Commissioner for Patents
Washington, DC. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

__X__ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; or before the mailing of a first office action after the filing of a request for continued examination; whichever occurs last)

____ under 37 CFR 1 .97(c) together with either a:
___ Statement under 37 CFR 1.97(e), or
___ a $180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)

___ under 37 CFR 1.97(d) together with a:
_____ Statement under 37 CFR 1.97(e), and
_____ a $180.00 fee set forth in 37 CFR 1 .17 (p).
(Filed after final action or notice of allowance, whichever occurs first, but before payment of the issue fee)

_____ under 37 CFR 1.97(e),

_____ each item of information contained herein was first cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

_____ no item of information contained herein was cited in a communication from a foreign patent office in a counterpart foreign application nor was known to any individual designated in ' 1.56(c) more than three months prior to the filing of the information disclosure statement.

__X__ Applicant(s) submit herewith PTO/SB/08a-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

The relevance of the attached references is that this is the closest art of which Applicant is aware. Applicant submits that the above references taken alone or in combination neither anticipate nor render obvious the present invention, Consideration of the foregoing in relation to this application is respectfully requested.

It is requested that the information disclosed herein he made of record in this application.

Respectfully submitted,

/Scott C. Hilton /

Scott C. Hilton
Reg. No. 66,011
Attorney for Applicants

Date: May 29, 2013
8 East Broadway, Suite 600
Salt Lake City, UT 84111
Telephone (801) 994-4646
Fax (801) 531-1929

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	
	Filing Date	
	First Named Inventor	Kelly D. Phillipps
	Art Unit	
	Examiner Name	
	Attorney Docket Number	3128.2.5

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7219085		2007-05-15	Buck, et al.	
	2	7814194		2010-10-12	Hellerstein, et al.	
	3	8160981		2012-04-17	Aparicio, IV	
	4	6523015		2003-02-18	Bera, et al.	
	5	6112304		2000-08-29	Clawson	
If you wish to add additional U.S. Patent citation information please click the Add button.						Add

U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20110119300		2011-05-19	Marcade	
If you wish to add additional U.S. Published Application citation information please click the Add button.						Add
FOREIGN PATENT DOCUMENTS						Remove

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Kelly D. Phillipps
	Art Unit	
	Examiner Name	
	Attorney Docket Number	3128.2.5

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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	1	McTIGUE, JAKE, "Predictive Analytics for IT", Information Week, March 2012, pgs. 17	☐
	2	PURPURA, STEPHEN, "Statistically Adaptive Learning for a General Class of Cost Functions (SA L-BFGS)", September 5, 2012, pgs. 7, arXiv:1209.0029v3 [cs.LG]	☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Kelly D. Phillipps
	Art Unit	
	Examiner Name	
	Attorney Docket Number	3128.2.5

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OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Scott C. Hilton/	Date (YYYY-MM-DD)	2013-05-29
Name/Print	Scott C. Hilton	Registration Number	66011

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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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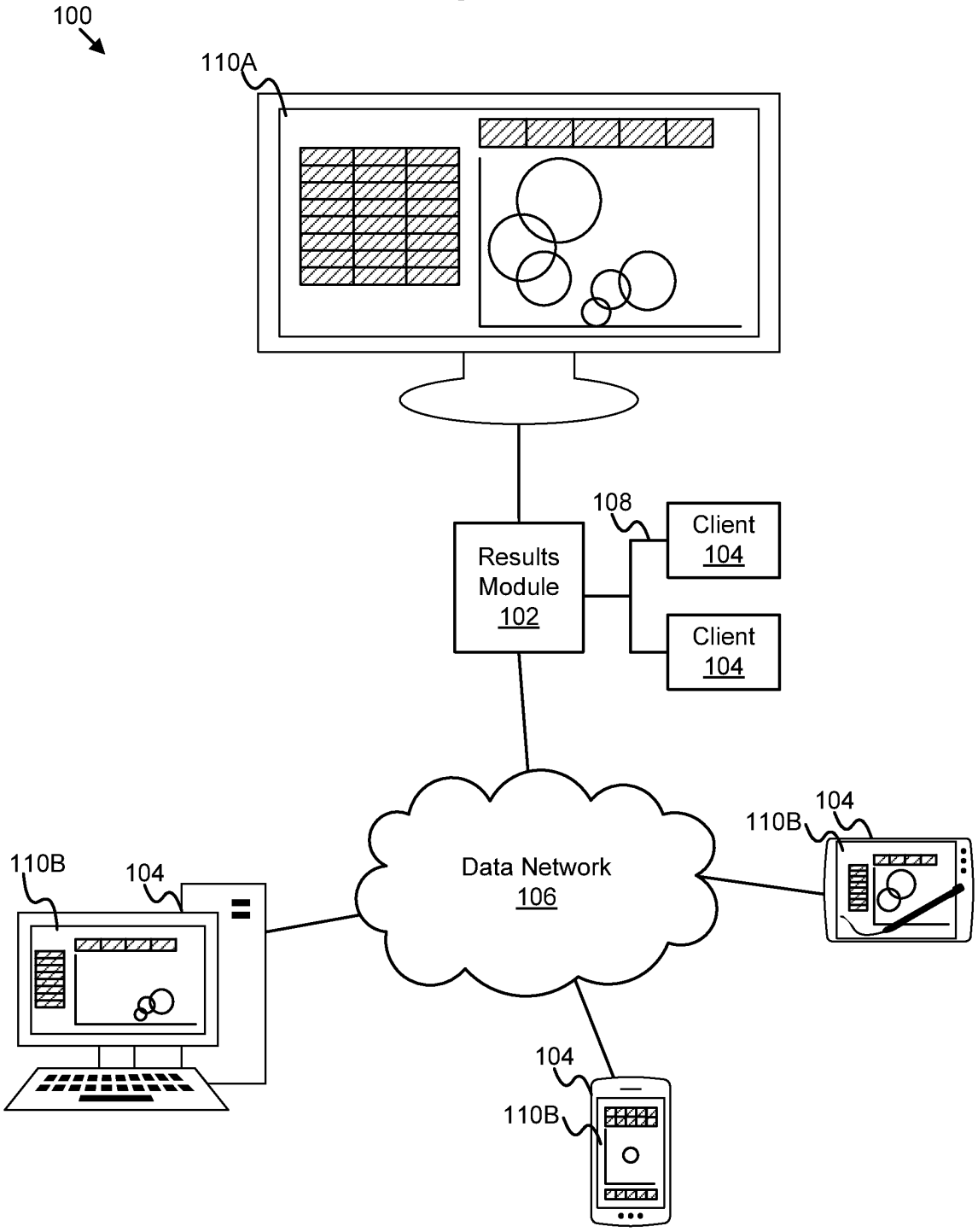

100
110A
108
Client
104
Results
Module
102
Client
104
Data Network
106
104
110B
110B
104
104
110B

FIG. 1A

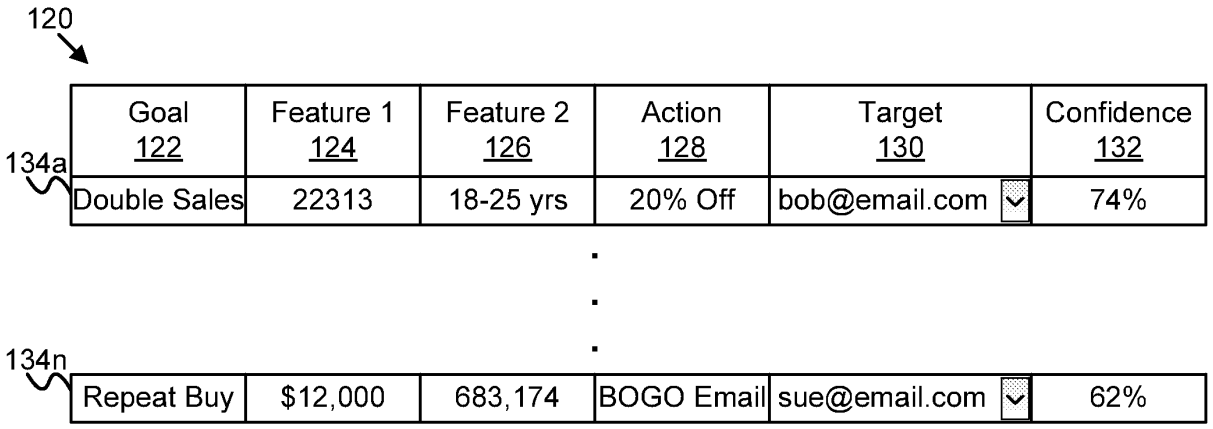

120
Goal 122
Feature 1 124
Feature 2 126
Action 128
Target 130
Confidence 132
134a
Double Sales
22313
18-25 yrs
20% Off
bob@email.com
74%
134n
Repeat Buy
$12,000
683,174
BOGO Email
sue@email.com
62%

FIG. 1B

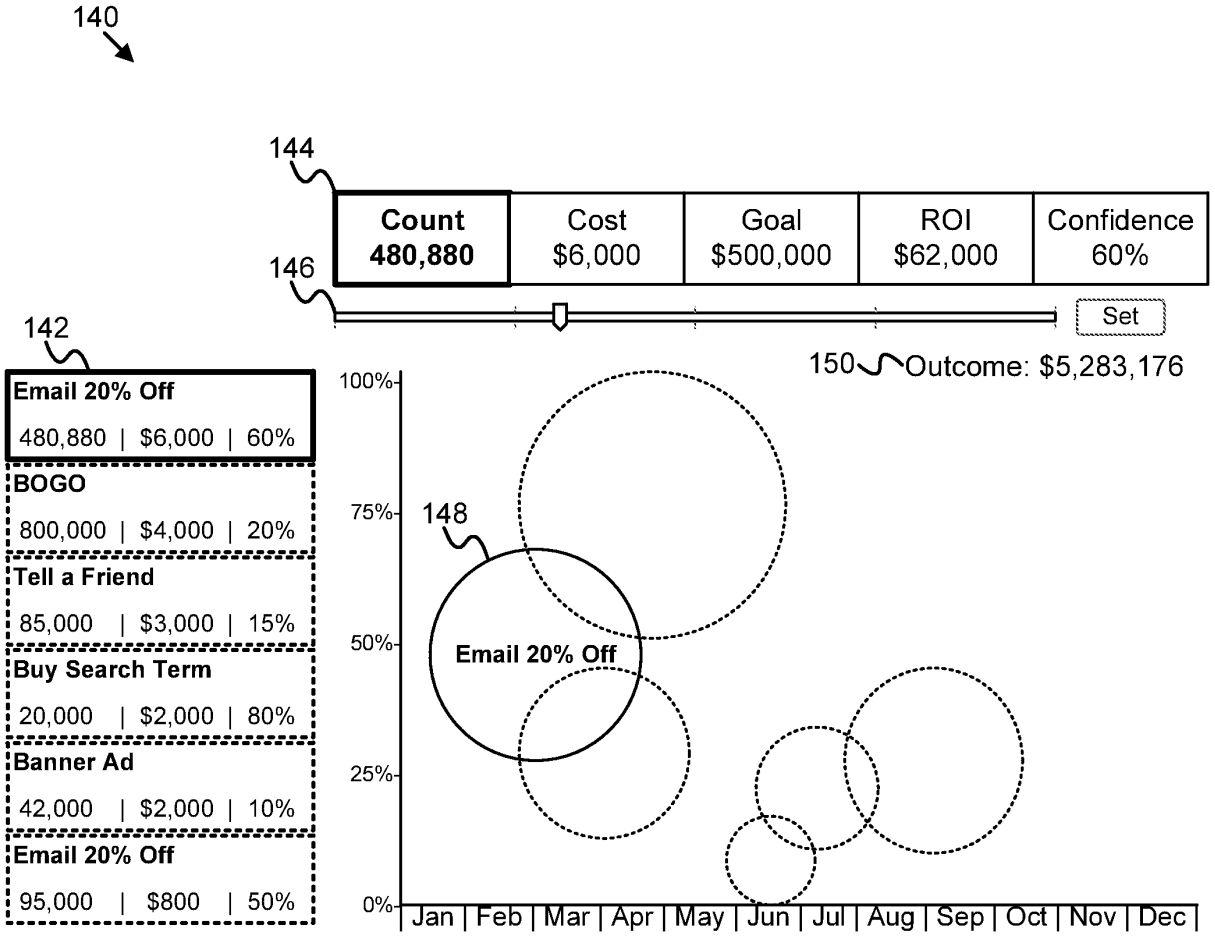

140
144
Count
480,880
Cost
$6,000
Goal
$500,000
ROI
$62,000
Confidence
60%
146
Set
142
150
Outcome: $5,283,176
Email 20% Off
480,880 | $6,000 | 60%
BOGO
800,000 | $4,000 | 20%
Tell a Friend
85,000 | $3,000 | 15%
Buy Search Term
20,000 | $2,000 | 80%
Banner Ad
42,000 | $2,000 | 10%
Email 20% Off
95,000 | $800 | 50%
100%
75%
50%
25%
0%
148
Email 20% Off
Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec

FIG. 1C

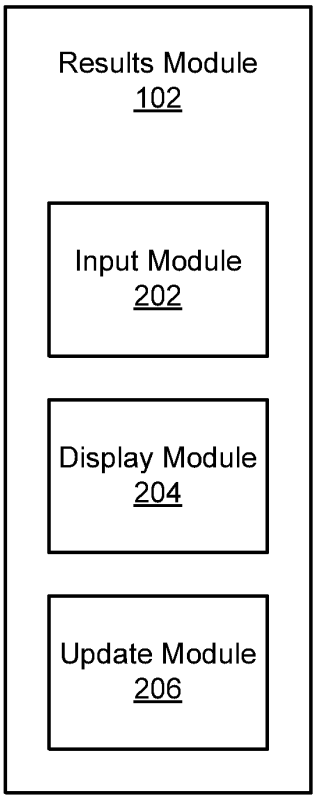

Results Module
102
Input Module
202
Display Module
204
Update Module
206

FIG. 2A

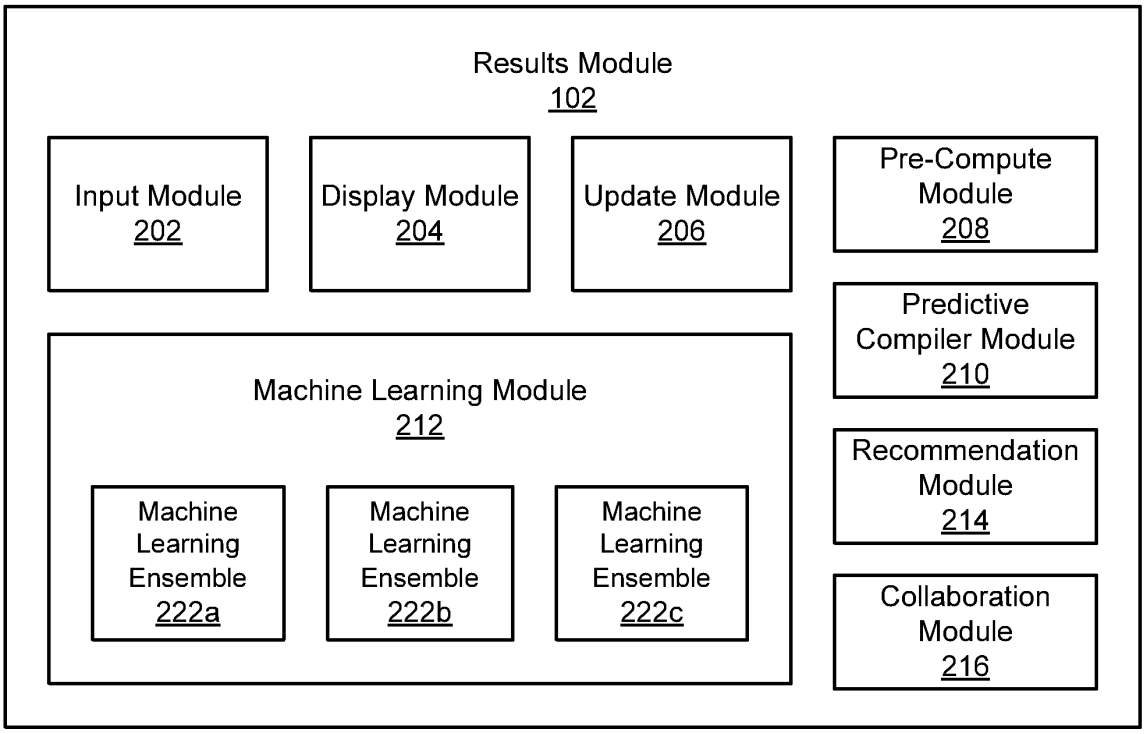

Results Module
102
Input Module
202
Display Module
204
Update Module
206
Pre-Compute Module
208
Predictive Compiler Module
210
Machine Learning Module
212
Machine Learning Ensemble
222a
Machine Learning Ensemble
222b
Machine Learning Ensemble
222c
Recommendation Module
214
Collaboration Module
216

FIG. 2B

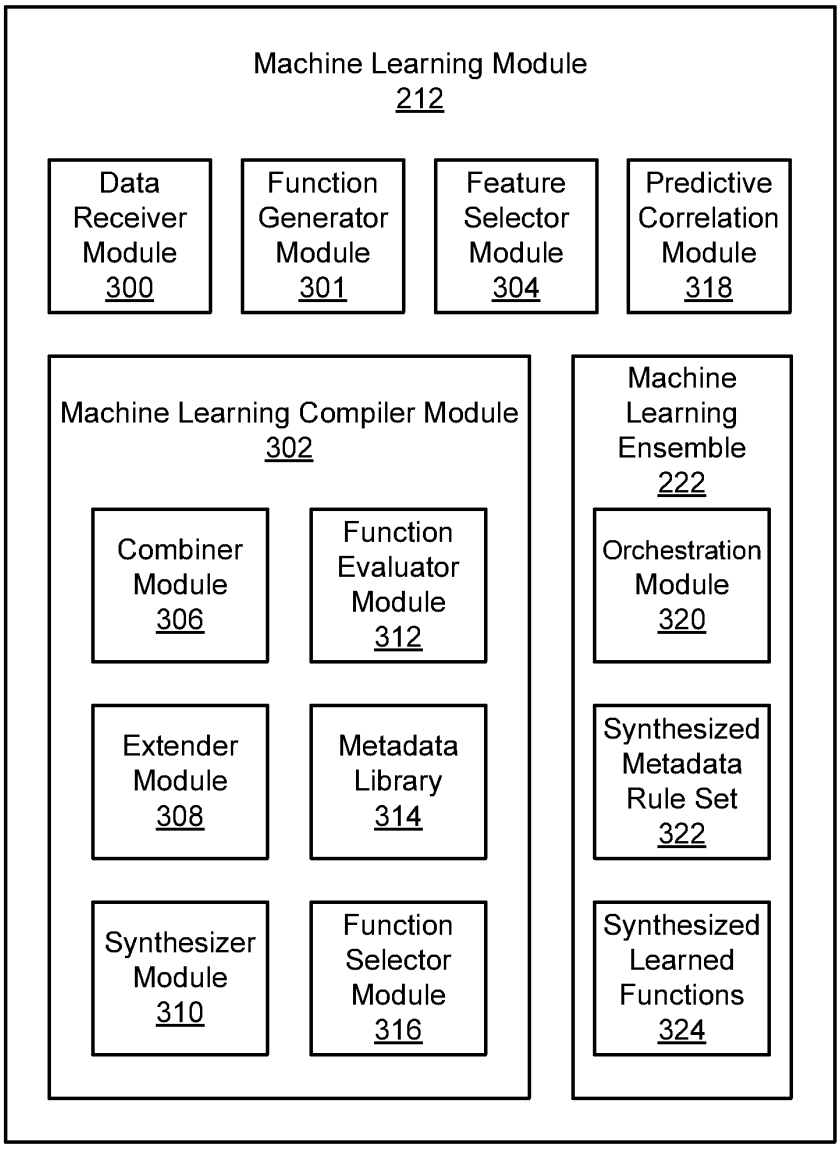

Machine Learning Module
212
Data Receiver Module 300
Function Generator Module 301
Feature Selector Module 304
Predictive Correlation Module 318
Machine Learning Compiler Module 302
Combiner Module 306
Function Evaluator Module 312
Extender Module 308
Metadata Library 314
Synthesizer Module 310
Function Selector Module 316
Machine Learning Ensemble 222
Orchestration Module 320
Synthesized Metadata Rule Set 322
Synthesized Learned Functions 324

FIG. 3

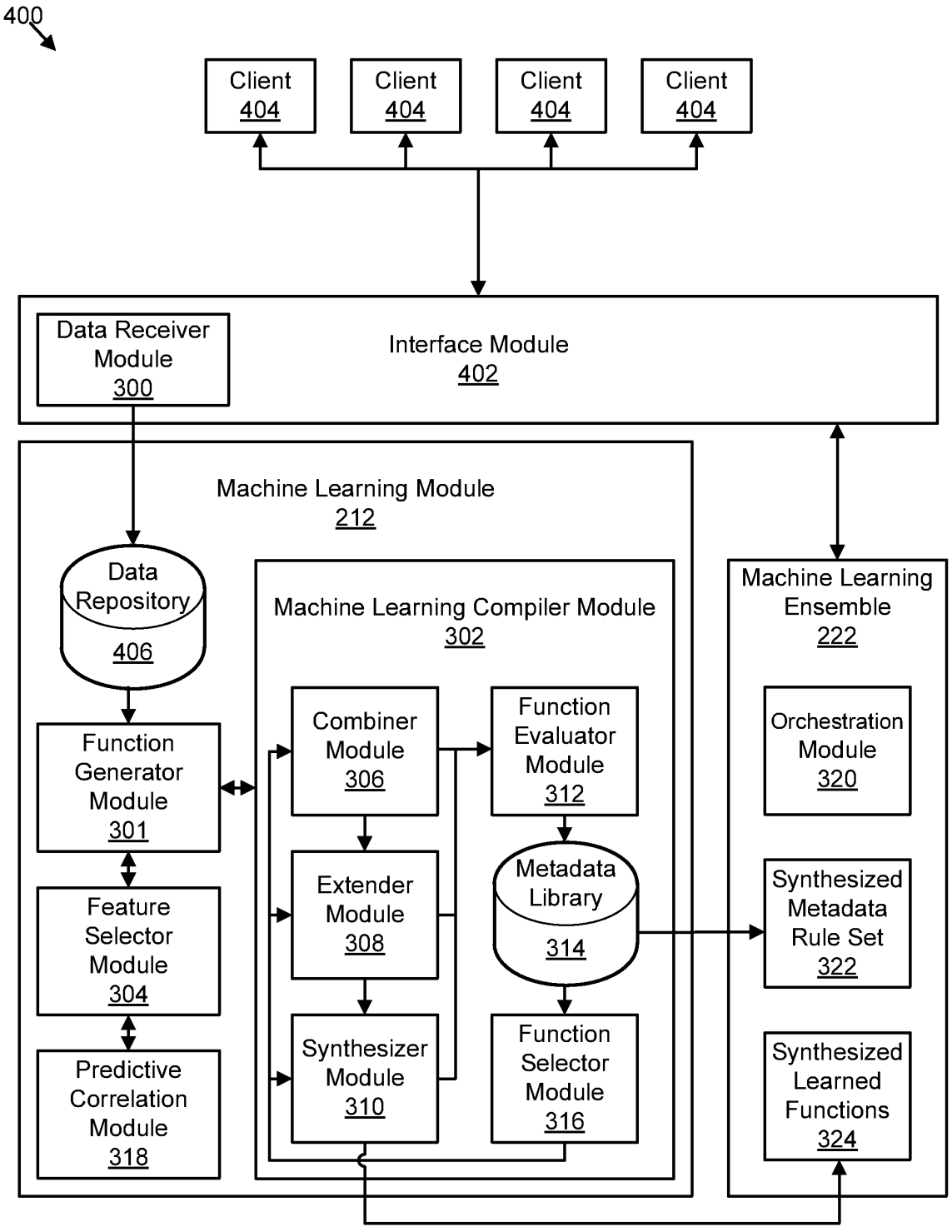

400
Client 404
Client 404
Client 404
Client 404
Data Receiver Module 300
Interface Module 402
Machine Learning Module 212
Data Repository 406
Function Generator Module 301
Feature Selector Module 304
Predictive Correlation Module 318
Machine Learning Compiler Module 302
Combiner Module 306
Extender Module 308
Synthesizer Module 310
Function Evaluator Module 312
Metadata Library 314
Function Selector Module 316
Machine Learning Ensemble 222
Orchestration Module 320
Synthesized Metadata Rule Set 322
Synthesized Learned Functions 324

FIG. 4

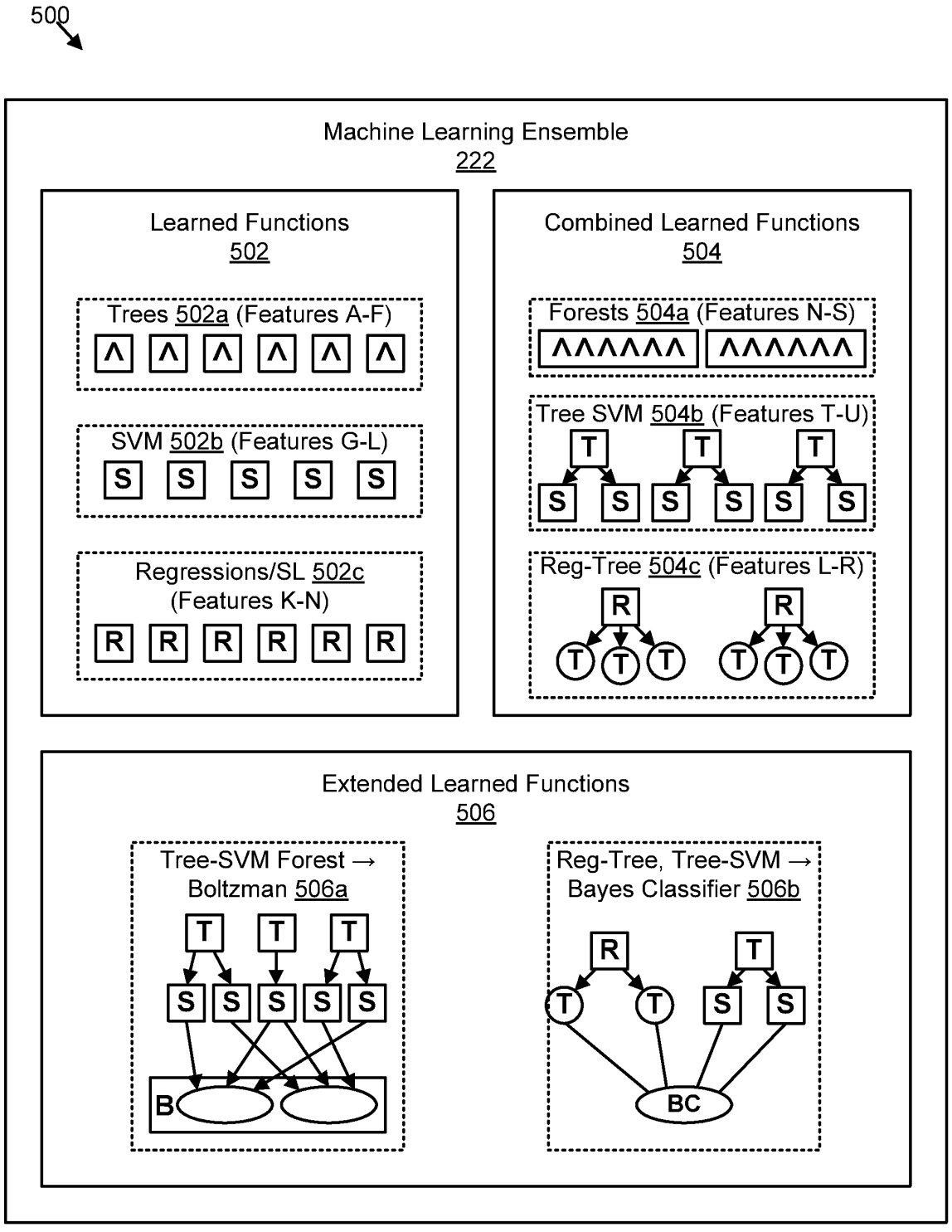

500
Machine Learning Ensemble
222
Learned Functions
502
Trees 502a (Features A-F)
SVM 502b (Features G-L)
Regressions/SL 502c
(Features K-N)
Combined Learned Functions
504
Forests 504a (Features N-S)
Tree SVM 504b (Features T-U)
Reg-Tree 504c (Features L-R)
Extended Learned Functions
506
Tree-SVM Forest →
Boltzman 506a
Reg-Tree, Tree-SVM →
Bayes Classifier 506b
BC

FIG. 5

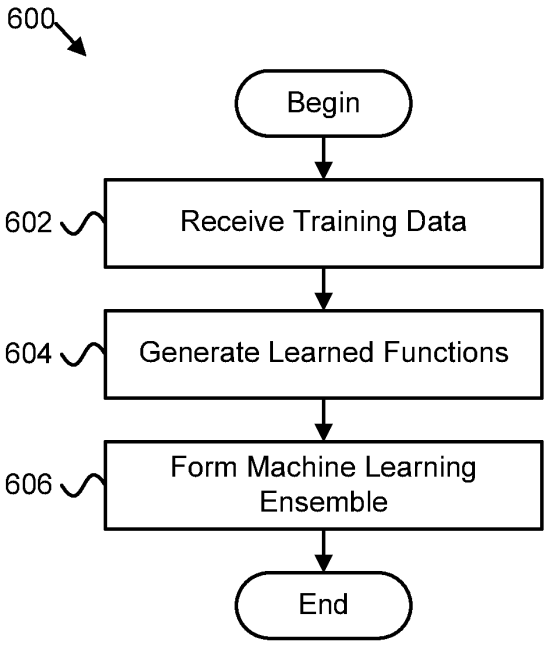

600
Begin
602
Receive Training Data
604
Generate Learned Functions
606
Form Machine Learning Ensemble
End

FIG. 6

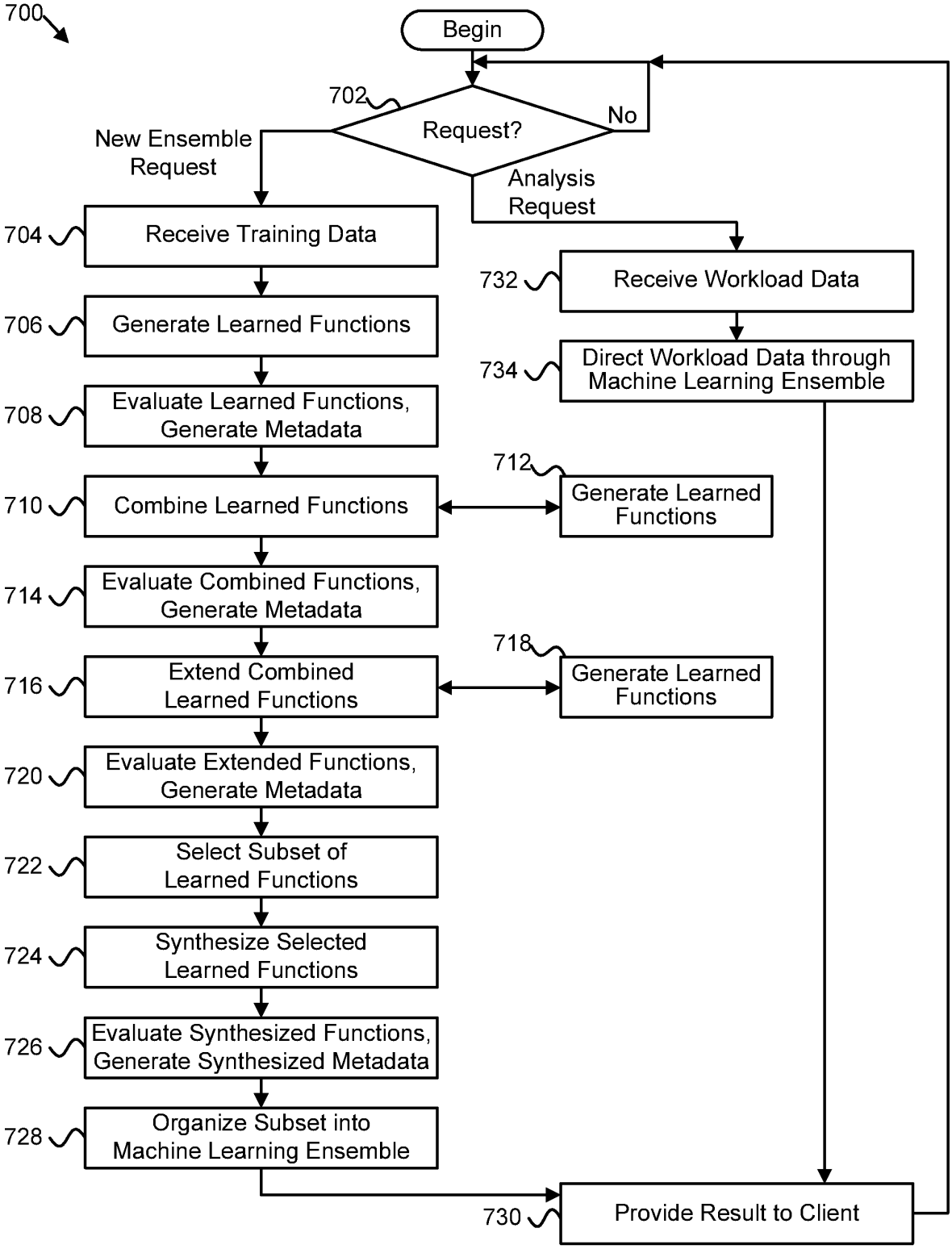

700
Begin
702
Request?
No
New Ensemble Request
Analysis Request
704
Receive Training Data
706
Generate Learned Functions
708
Evaluate Learned Functions, Generate Metadata
710
Combine Learned Functions
712
Generate Learned Functions
714
Evaluate Combined Functions, Generate Metadata
716
Extend Combined Learned Functions
718
Generate Learned Functions
720
Evaluate Extended Functions, Generate Metadata
722
Select Subset of Learned Functions
724
Synthesize Selected Learned Functions
726
Evaluate Synthesized Functions, Generate Synthesized Metadata
728
Organize Subset into Machine Learning Ensemble
732
Receive Workload Data
734
Direct Workload Data through Machine Learning Ensemble
730
Provide Result to Client

FIG. 7

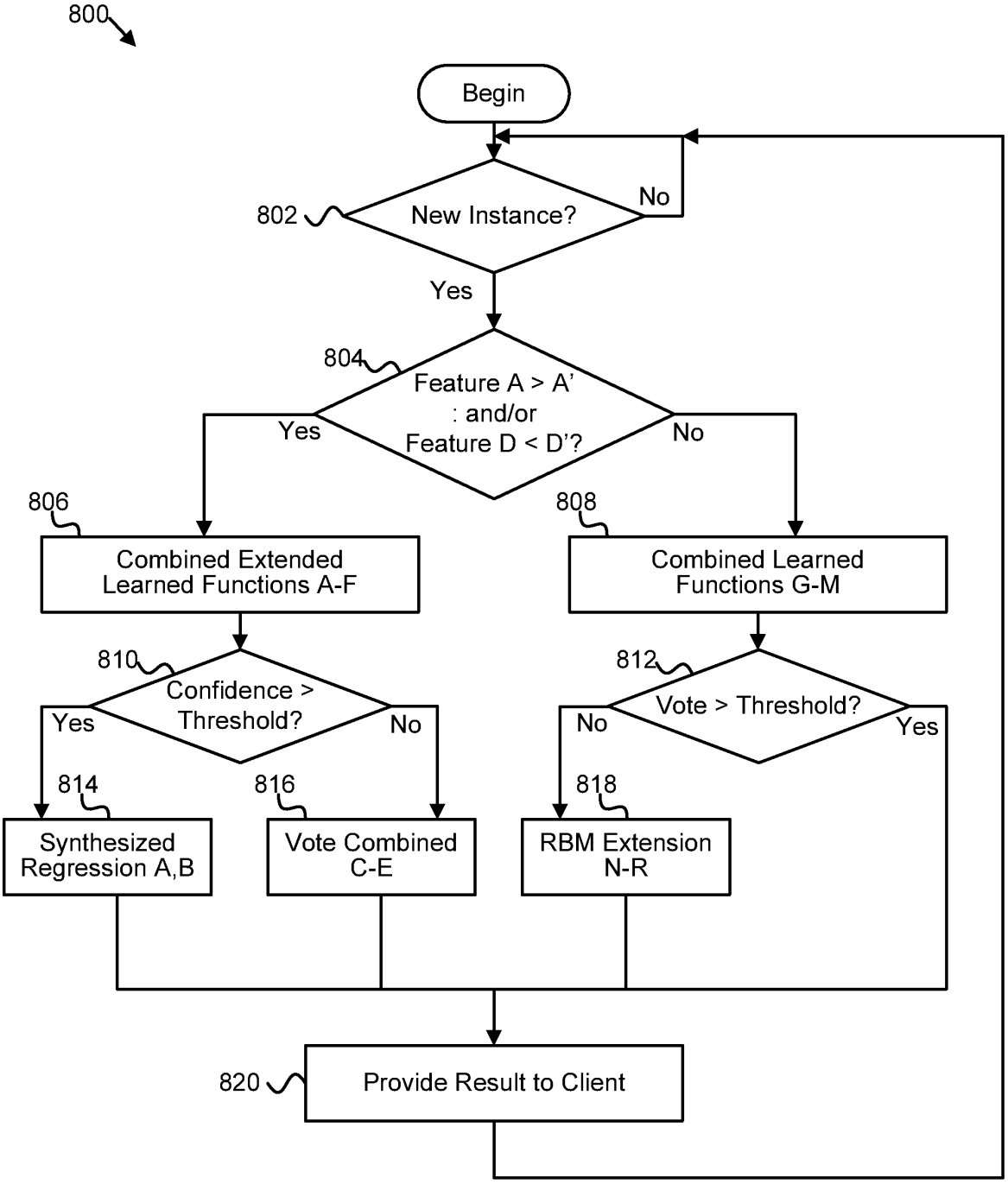

800
Begin
802
New Instance?
No
Yes
804
Feature A > A'
: and/or
Feature D < D'?
Yes
No
806
Combined Extended
Learned Functions A-F
808
Combined Learned
Functions G-M
810
Confidence >
Threshold?
Yes
No
812
Vote > Threshold?
No
Yes
814
Synthesized
Regression A,B
816
Vote Combined
C-E
818
RBM Extension
N-R
820
Provide Result to Client

FIG. 8

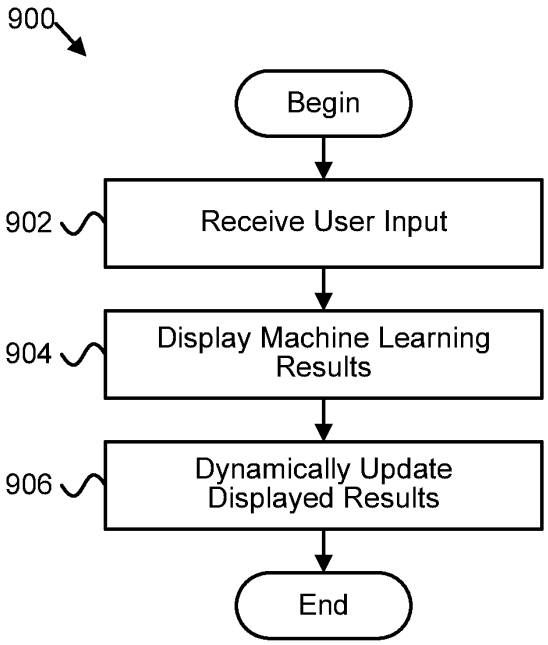

900
Begin
902
Receive User Input
904
Display Machine Learning Results
906
Dynamically Update Displayed Results
End

FIG. 9

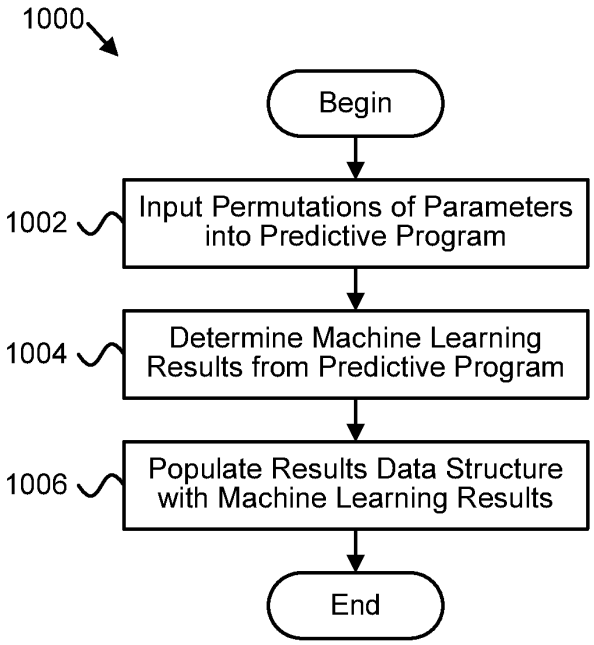

1000
Begin
1002
Input Permutations of Parameters into Predictive Program
1004
Determine Machine Learning Results from Predictive Program
1006
Populate Results Data Structure with Machine Learning Results
End

FIG. 10

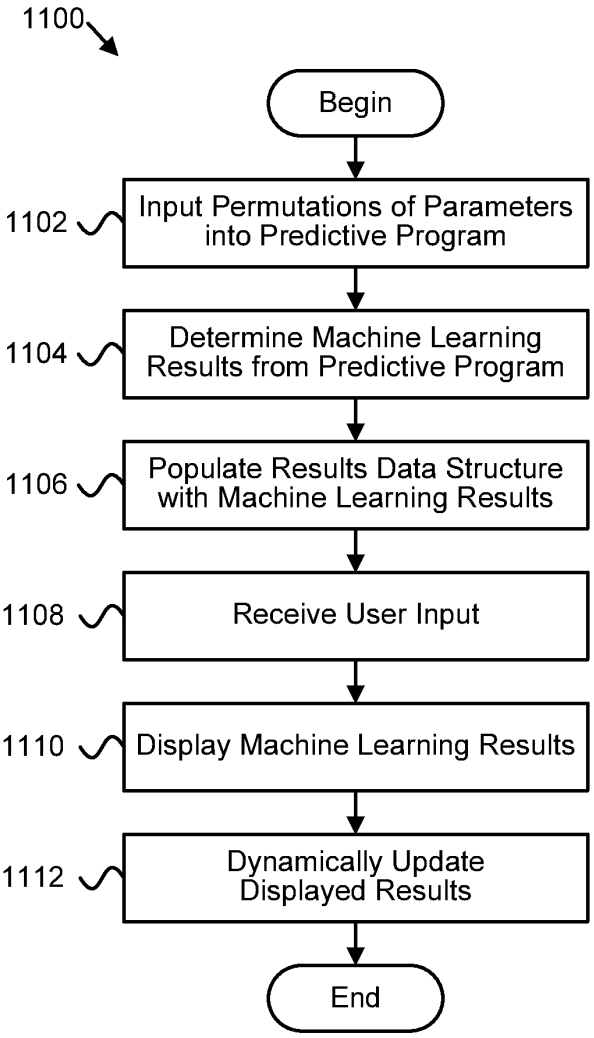

1100
Begin
1102
Input Permutations of Parameters into Predictive Program
1104
Determine Machine Learning Results from Predictive Program
1106
Populate Results Data Structure with Machine Learning Results
1108
Receive User Input
1110
Display Machine Learning Results
1112
Dynamically Update Displayed Results
End

FIG. 11

PATENT APPLICATION
Kunzler Law Group Docket No.: 3128.2.5

UNITED STATES PATENT APPLICATION

of

KELLY D. PHILLIPPS

and

RICHARD W. WELLMAN

for

USER INTERFACE FOR MACHINE LEARNING

USER INTERFACE FOR MACHINE LEARNING

TECHNICAL FIELD

[0001] The present disclosure, in various embodiments, relates to machine learning and more particularly relates to a dynamic user interface for machine learning results.

BACKGROUND

[0002] Machine learning predictions or other machine learning analyses are often represented as static numbers, which may be interpreted by a Data Scientist or other expert. Raw machine learning data can be confusing and inaccessible, and may hold little meaning for a lay person attempting to interpret the data.

[0003] For example, a business person, sales person, or the like may use machine learning to predict business actions or outcomes. However, a static machine learning prediction may hold little if any significance, and may be difficult to apply in practice.

[0004] Further, a machine learning prediction is typically made with certain parameters or inputs, and may take substantial time to calculate or determine. If a user, such as the business person or sales person from the previous example, would like to change a parameter or input, a substantial delay will occur before a new machine learning prediction is available.

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SUMMARY

[0005] From the foregoing discussion, it should be apparent that a need exists for an apparatus, system, and method to provide an accessible user interface for machine learning results. Beneficially, such an apparatus, system, and method would dynamically update and display machine learning results during runtime, with little or no delay.

[0006] The present disclosure has been developed in response to the present state of the art, and in particular, in response to the problems and needs in the art that have not yet been fully solved by currently available machine learning methods. Accordingly, the present disclosure has been developed to provide an apparatus, system, and method for machine learning results that overcome many or all of the above-discussed shortcomings in the art.

[0007] Apparatuses are presented for machine learning results. In one embodiment, an input module is configured to receive user input identifying one or more values for one or more machine learning parameters. In a further embodiment, a display module is configured to display one or more machine learning results for one or more identified machine learning parameters in response to an input module receiving user input. One or more machine learning results, in certain embodiments, are determined using machine learning and an identified machine learning parameter. In another embodiment, an update module is configured to dynamically update one or more displayed machine learning results in response to an input module receiving additional user input identifying one or more additional values for one or more machine learning parameters.

[0008] Methods are presented for machine learning results. In one embodiment, a method includes inputting permutations of machine learning parameters incrementally between minimum values for the machine learning parameters and maximum values for the machine learning parameters into a predictive program. In a further embodiment, a method includes determining machine learning results from a predictive program for

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input permutations of machine learning parameters. A method, in another embodiment, includes populating a results data structure with determined machine learning results indexed by machine learning parameters.

[0009] Systems for machine learning results are presented. In one embodiment, a pre-compute module is configured to predetermine, using one or more predictive programs, permutations of machine learning results for each of the one or more predictive programs at predefined increments between minimum values for machine learning parameters and maximum values for the machine learning parameters. An input module, in certain embodiments, is configured to receive user input from multiple users identifying values for one or more machine learning parameters for one or more predictive programs. A display module, in a further embodiment, is configured to display one or more predetermined machine learning results to multiple users based on identified values.

[0010] Reference throughout this specification to features, advantages, or similar language does not imply that all of the features and advantages that may be realized with the present disclosure should be or are in any single embodiment of the disclosure. Rather, language referring to the features and advantages is understood to mean that a specific feature, advantage, or characteristic described in connection with an embodiment is included in at least one embodiment of the present disclosure. Thus, discussion of the features and advantages, and similar language, throughout this specification may, but do not necessarily, refer to the same embodiment.

[0011] Furthermore, the described features, advantages, and characteristics of the disclosure may be combined in any suitable manner in one or more embodiments. The disclosure may be practiced without one or more of the specific features or advantages of a particular embodiment. In other instances, additional features and advantages may be recognized in certain embodiments that may not be present in all embodiments of the disclosure.

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[0012] These features and advantages of the present disclosure will become more fully apparent from the following description and appended claims, or may be learned by the practice of the disclosure as set forth hereinafter.

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BRIEF DESCRIPTION OF THE DRAWINGS

[0013] In order that the advantages of the disclosure will be readily understood, a more particular description of the disclosure briefly described above will be rendered by reference to specific embodiments that are illustrated in the appended drawings. Understanding that these drawings depict only typical embodiments of the disclosure and are not therefore to be considered to be limiting of its scope, the disclosure will be described and explained with additional specificity and detail through the use of the accompanying drawings, in which:

[0014] Figure 1A is a schematic block diagram illustrating one embodiment of a system for machine learning results;

[0015] Figure 1B is a schematic block diagram illustrating one embodiment of a graphical display for machine learning results;

[0016] Figure 1C is a schematic block diagram illustrating a further embodiment of a graphical display for machine learning results;

[0017] Figure 2A is a schematic block diagram illustrating one embodiment of a results module;

[0018] Figure 2B is a schematic block diagram illustrating another embodiment of a results module;

[0019] Figure 3 is a schematic block diagram illustrating one embodiment of an machine learning module;

[0020] Figure 4 is a schematic block diagram illustrating one embodiment of a system for a machine learning factory;

[0021] Figure 5 is a schematic block diagram illustrating one embodiment of learned functions for a machine learning ensemble;

[0022] Figure 6 is a schematic flow chart diagram illustrating one embodiment of a method for a machine learning factory;

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[0023] Figure 7 is a schematic flow chart diagram illustrating another embodiment of a method for a machine learning factory;

[0024] Figure 8 is a schematic flow chart diagram illustrating one embodiment of a method for directing data through a machine learning ensemble;

[0025] Figure 9 is a schematic flow chart diagram illustrating one embodiment of a method for machine learning results;

[0026] Figure 10 is a schematic flow chart diagram illustrating another embodiment of a method for machine learning results; and

[0027] Figure 11 is a schematic flow chart diagram illustrating a further embodiment of a method for machine learning results.

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DETAILED DESCRIPTION

[0028] Aspects of the present disclosure may be embodied as an apparatus, system, method, or computer program product. Accordingly, aspects of the present disclosure may take the form of an entirely hardware embodiment, an entirely software embodiment (including firmware, resident software, micro-code, etc.) or an embodiment combining software and hardware aspects that may all generally be referred to herein as a "circuit," "module" or "system." Furthermore, aspects of the present disclosure may take the form of a computer program product embodied in one or more computer readable storage media having computer readable program code embodied thereon.

[0029] Many of the functional units described in this specification have been labeled as modules, in order to more particularly emphasize their implementation independence. For example, a module may be implemented as a hardware circuit comprising custom VLSI circuits or gate arrays, off-the-shelf semiconductors such as logic chips, transistors, or other discrete components. A module may also be implemented in programmable hardware devices such as field programmable gate arrays, programmable array logic, programmable logic devices or the like.

[0030] Modules may also be implemented in software for execution by various types of processors. An identified module of executable code may, for instance, comprise one or more physical or logical blocks of computer instructions which may, for instance, be organized as an object, procedure, or function. Nevertheless, the executables of an identified module need not be physically located together, but may comprise disparate instructions stored in different locations which, when joined logically together, comprise the module and achieve the stated purpose for the module.

[0031] Indeed, a module of executable code may be a single instruction, or many instructions, and may even be distributed over several different code segments, among different programs, and across several memory devices. Similarly, operational data may be identified and illustrated herein within modules, and may be embodied in any suitable

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form and organized within any suitable type of data structure. The operational data may be collected as a single data set, or may be distributed over different locations including over different storage devices, and may exist, at least partially, merely as electronic signals on a system or network. Where a module or portions of a module are implemented in software, the software portions are stored on one or more computer readable storage media.

[0032] Any combination of one or more computer readable storage media may be utilized. A computer readable storage medium may be, for example, but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, or device, or any suitable combination of the foregoing.

[0033] More specific examples (a non-exhaustive list) of the computer readable storage medium would include the following: a portable computer diskette, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), a portable compact disc read-only memory (CD-ROM), a digital versatile disc (DVD), a Blu-ray disc, an optical storage device, a magnetic tape, a Bernoulli drive, a magnetic disk, a magnetic storage device, a punch card, integrated circuits, other digital processing apparatus memory devices, or any suitable combination of the foregoing, but would not include propagating signals. In the context of this document, a computer readable storage medium may be any tangible medium that can contain, or store a program for use by or in connection with an instruction execution system, apparatus, or device.

[0034] Computer program code for carrying out operations for aspects of the present disclosure may be written in any combination of one or more programming languages, including an object oriented programming language such as Java, Python, C++ or the like and conventional procedural programming languages, such as the "C" programming language or similar programming languages. The program code may execute entirely on the user's computer, partly on the user's computer, as a stand-alone

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software package, partly on the user's computer and partly on a remote computer or entirely on the remote computer or server. In the latter scenario, the remote computer may be connected to the user's computer through any type of network, including a local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the Internet using an Internet Service Provider).

[0035] Reference throughout this specification to "one embodiment," "an embodiment," or similar language means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present disclosure. Thus, appearances of the phrases "in one embodiment," "in an embodiment," and similar language throughout this specification may, but do not necessarily, all refer to the same embodiment, but mean "one or more but not all embodiments" unless expressly specified otherwise. The terms "including," "comprising," "having," and variations thereof mean "including but not limited to" unless expressly specified otherwise. An enumerated listing of items does not imply that any or all of the items are mutually exclusive and/or mutually inclusive, unless expressly specified otherwise. The terms "a," "an," and "the" also refer to "one or more" unless expressly specified otherwise.

[0036] Furthermore, the described features, structures, or characteristics of the disclosure may be combined in any suitable manner in one or more embodiments. In the following description, numerous specific details are provided, such as examples of programming, software modules, user selections, network transactions, database queries, database structures, hardware modules, hardware circuits, hardware chips, etc., to provide a thorough understanding of embodiments of the disclosure. However, the disclosure may be practiced without one or more of the specific details, or with other methods, components, materials, and so forth. In other instances, well-known structures, materials,

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or operations are not shown or described in detail to avoid obscuring aspects of the disclosure.

[0037] Aspects of the present disclosure are described below with reference to schematic flowchart diagrams and/or schematic block diagrams of methods, apparatuses, systems, and computer program products according to embodiments of the disclosure. It will be understood that each block of the schematic flowchart diagrams and/or schematic block diagrams, and combinations of blocks in the schematic flowchart diagrams and/or schematic block diagrams, can be implemented by computer program instructions. These computer program instructions may be provided to a processor of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, create means for implementing the functions/acts specified in the schematic flowchart diagrams and/or schematic block diagrams block or blocks.

[0038] These computer program instructions may also be stored in a computer readable storage medium that can direct a computer, other programmable data processing apparatus, or other devices to function in a particular manner, such that the instructions stored in the computer readable storage medium produce an article of manufacture including instructions which implement the function/act specified in the schematic flowchart diagrams and/or schematic block diagrams block or blocks.

[0039] The computer program instructions may also be loaded onto a computer, other programmable data processing apparatus, or other devices to cause a series of operational steps to be performed on the computer, other programmable apparatus or other devices to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide processes for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

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[0040] The schematic flowchart diagrams and/or schematic block diagrams in the Figures illustrate the architecture, functionality, and operation of possible implementations of apparatuses, systems, methods and computer program products according to various embodiments of the present disclosure. In this regard, each block in the schematic flowchart diagrams and/or schematic block diagrams may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function(s).

[0041] It should also be noted that, in some alternative implementations, the functions noted in the block may occur out of the order noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. Other steps and methods may be conceived that are equivalent in function, logic, or effect to one or more blocks, or portions thereof, of the illustrated figures.

[0042] Although various arrow types and line types may be employed in the flowchart and/or block diagrams, they are understood not to limit the scope of the corresponding embodiments. Indeed, some arrows or other connectors may be used to indicate only the logical flow of the depicted embodiment. For instance, an arrow may indicate a waiting or monitoring period of unspecified duration between enumerated steps of the depicted embodiment. It will also be noted that each block of the block diagrams and/or flowchart diagrams, and combinations of blocks in the block diagrams and/or flowchart diagrams, can be implemented by special purpose hardware-based systems that perform the specified functions or acts, or combinations of special purpose hardware and computer instructions.

[0043] The description of elements in each figure may refer to elements of proceeding figures. Like numbers refer to like elements in all figures, including alternate embodiments of like elements.

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[0044] Figure 1A depicts one embodiment of a system 100 for machine learning results. The system 100, in the depicted embodiment, includes one or more results modules 102. A results module 102 may be in communication with several clients 104, other results modules 102, or the like over a data network 106, over a local channel 108 such as a system bus, an application programming interface (API), or the like. A results module 102 may display various machine learning results on one or more electronic display devices 110 to one or more users or other clients 104. A client 104 may comprise a software application, a user, a hardware computing device with a processor and memory, or another entity in communication with a results module 102.

[0045] In general, a results module 102 dynamically displays or otherwise presents machine learning results using a user interface for one or more users or other clients 104. As used herein, a user interface may include a graphical user interface (GUI), a command line interface, an auditory or verbal interface, a tactile or touch interface, or another human-machine interface allowing input and/or output between a user and the results module 102, through a computing device such as a client 104 or the like. The one or more results modules 102, in certain embodiments, may display machine learning results graphically on one or more electronic display devices 110, such as a liquid crystal display (LCD) device, light emitting diode (LED) display device, a plasma display device, an electronic ink display device, a television, a computer monitor, a mobile device screen such as a mobile phone or tablet screen, a projector, and/or another electronic display device 110. An electronic display device 110 may also comprise a touchscreen or other input device, allowing a user to directly manipulate machine learning inputs or results for the one or more results modules 102. In certain embodiments, a computing device or other client 104 may include one or more user input devices, such as a mouse, a keyboard, a touchpad, a microphone, a camera, an accelerometer, or the like allowing a user to provide user input to a results module 102.

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[0046] In certain embodiments, the results module 102 provides and/or accesses a machine learning framework allowing the results module 102 and/or clients 104 to request machine learning ensembles, to make analysis requests, and to receive machine learning results, such as a classification, a confidence metric, an inferred function, a regression function, an answer, a prediction, a recognized pattern, a rule, a recommendation, or other results. Machine learning, as used herein, comprises one or more modules, computer executable program code, logic hardware, and/or other entities configured to learn from or train on input data, and to apply the learning or training to provide results or analysis for subsequent data. Machine learning and generating machine learning ensembles or other machine learning program code is described in greater detail below with regard to Figure 3 through Figure 8.

[0047] The results module 102, in one embodiment, comprises a machine learning simulator or pre-cache configured to pre-determine, pre-compute, and/or cache machine learning results in a results data structure, so that the results module 102 may dynamically display different permutations of the machine learning results in response to user input from a client 104 or otherwise dynamically access machine learning results. The results module 102, in a further embodiment, provides a graphical user interface to engage the pre-determined and/or simulated machine learning results in a visual form.

[0048] As described above, machine learning results that are represented as static numbers can be confusing and difficult to understand. Machine learning may also receive large amounts of data as input for processing, and the machine learning inputs may be equally complex and daunting for a lay person to interpret or manipulate. To overcome or minimize these shortcomings, the one or more results modules 102, in certain embodiments, may use a cognitive, visual model to provide meaning to machine learning inputs, results, and/or other parameters. The one or more results modules 102 may allow dynamic manipulation of one or more machine learning inputs, results, and/or other parameters and may dynamically update a display (or other presentation) of other

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related machine learning inputs, results, and/or other parameters in at or near real-time, so that the machine learning inputs, results, and/or other parameters are interactive.

[0049] For example, the one or more results modules 102 may present machine learning inputs, results, and/or other parameters for a business to a business person, sales person, or another user to predict business actions or outcomes, provide business recommendations, or the like. Because, in certain embodiments, the one or more results modules 102 present the machine learning inputs, results, and/or other parameters in a dynamic, experiential manner, using an interactive data visualization or the like, the one or more results modules 102 may facilitate understanding of the meaning of the presented data, without burdening the user with the minutia and complexity of the literal underlying data. The one or more results modules 102 may present machine learning inputs, results, predictions, and/or other parameters in a manner that communicates business meaning to a user, allowing the user to navigate and recognize patterns in enterprise data, thereby determining optimal actions for the business.

[0050] In order to dynamically display or otherwise present updated machine learning results or other parameters to a user at or near real-time, in certain embodiments, the one or more results modules 102 may pre-compute, pre-determine, and/or pre-cache different permutations of the machine learning results and/or other parameters. Pre-computing each permutation of machine learning results, indexed by machine learning input parameters, in certain embodiments, allows the one or more results modules 102 to dynamically update displayed machine learning results and/or other parameters with little or no delay in response to receiving input from a user or other client 104, without having to process new machine learning inputs for each user input.

[0051] The one or more results modules 102 may use machine learning, such as the machine learning ensembles or other machine learning program code described below to generate a plurality of predictive outcomes or other machine learning results from a data set that is comprised of a plurality of instances (e.g., rows) and a plurality of actions

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(e.g., features, attributes, and/or columns). By using historical customer data sets to understand the interaction between the various actions, the one or more results modules 102 may achieve a level of confidence in using the historical data to generate patterns to predict future events, recommended actions, or the like using machine learning.

[0052] The one or more results modules 102 may process each instance within the data set to generate a new set of predictive metrics (e.g., machine learning results). The one or more results modules 102 may perform this processing of data iteratively for each instance, deriving a new set of predictive metrics or other machine learning results for each iteration. The accumulation of each of the predictive metrics or machine learning results gathered after processing each of the different instances by the one or more results modules 102 may populate a table or other results data structure of predictive, machine learning information (e.g., machine learning inputs, machine learning results, and/or other machine learning parameters) that is pre-processed and readily accessible by the one or more results modules 102 for presentation to a user with direct correlation between the various actions.

[0053] The table or other results data structure may include up to millions of predictions or other machine learning results. This table or other results data structure may accommodate user interaction with the predictive metrics presented by the one or more results modules 102 in a substantially real-time manner.

[0054] The results module 102, in certain embodiments, provides a user interface that is an interactive, visual representation of the pre-computed, pre-cached machine learning data, using a visual method to define a goal or the like. This may facilitate the ability of a user to see a simulation or representation of any possible action as they relate to a goal, based on pre-computed machine learning processing of the associated data. For example, the one or more results modules 102 may enable a user to evaluate any number of actions in real-time, substantially instantaneously - as it relates to that goal and their interplay across a massively large number of possible actions. The one or more results

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modules 102 may allow a user to move or adjust any one feature and watch the other variables dynamically update and change (e.g., interplay).

[0055] Instead of using static graphs or tables to display historical information, things that have already occurred and that are by nature, static or fixed (since the past cannot be changed), the one or more results modules 102 may dynamically display and update outcomes or results by showing a user what actions are recommended to obtain a desired result or goal, while allowing the user to update or change input parameters, results, and/or goals in real-time. The output of the one or more results modules 102 may be the generation of a discrete action list or action plan. An action plan may include one or more steps or actions a user may take in order to achieve the desired results or goal, a list of recommended targets for an action, or the like. A user may define a desired result or goal by directly adjusting or selecting an action, and the one or more results modules 102 may display or otherwise present the interplay between other metrics and their predicted outcomes or results as well as a final list of actions recommended to accomplish such results.

[0056] In certain embodiments, the one or more results modules 102 may provide an interactive graphical user interface that dynamically displays and adjusts an action plan, indicating the recommended work and resources to achieve a specific goal or desired outcome. In one embodiment, the graphical user interface of the one or more results modules 102 may include a dynamic graph with multiple circles or other objects, where each circle or other object represents an action or result. The one or more results modules 102 may allow a user to move the result objects around the graph, re-size the objects by stretching or pinching, or otherwise manipulate or adjust the objects. For example, in certain embodiments, an x-axis may represent time; a y-axis may represent cost, investment, man-hours, resources, or the like; a size of an object may represent a size or reach of results or targets; opacity, color, or shading of an object may represent A

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confidence metric for a prediction or recommendation; opacity, color, or shading of an object may represent a target list recommended for the associated action; or the like.

[0057] By moving the target circle or other object around the graph, in one embodiment, the opacity or other representation of confidence for corresponding objects will change based on its placement on the graph. Corresponding circles or other objects may also change in appearance (e.g., size, location, opacity, color, or the like) based on a user's placement of an original, target circle or other object on the graph. In certain graphs or other graphical user interfaces of the one or more results modules 102, a user may be allowed to adjust a value for an overall goal.

[0058] The one or more results modules 102 may use a movement, re-sizing, or other adjustment of the circles or other objects on the graph is an input to a results data structure to update the positions and sizes of other objects on the graph, other attributes of the adjusted object, or the like. In certain embodiments, a user may set one more results or goals to their desired outcomes or states, and the one or more results modules 102 may present what is recommended, in terms of actions, to accomplish the desired outcomes or states using the pre-computed or pre-cached machine learning results. Once the results, goals, or other parameters are set by a user, the presented action list may indicate to the user what actions to take, how many times to take an action, when to take an action, one or more targets of an action, or the like.

[0059] The one or more results modules 102 may present a graphical user interface that allows a user or other client 104 to manipulate its content, in an interactive manner, in order to simulate pre-computed machine learning results, which may dictate a specific list of actions required to obtain a goal or desired outcome. A graphical user interface, as used herein, may include displayed visual objects as described above, a spreadsheet or table with numerical values (e.g., modifying cell contents for a particular action to see an effect on other cells, an action list, or the like).

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[0060] In certain embodiments, the one or more results modules 102 may allow a user to specify or adjust an action and see the action's predicted outcome or effect on a goal. A user may specify a desired goal value and see the machine learning predicted actions required to achieve that goal, based on a previously computed machine learning analysis of the user's data. A user, in certain embodiments, may specify a confidence metric or the like and the one or more results modules 102 may present one or more actions, attributes, features, goals, or the like that have a highest correlation to or impact on the confidence metric, based on the pre-computed or pre-cached machine learning results. A user, in one embodiment, may directly manipulate a graphical object representing a goal, for example a familiar business graph such as a line chart, and see a graphical representation of the actions predicted to have the greatest effect on achieving the goal. The results module 102 may present such controls graphically or in another manner.

[0061] In one embodiment, the one or more results modules 102 may provide a dynamic interface for predictive analytics. Predictive analytics is the study of past performance, or patterns, found in historical and transactional data to identify behavior and trends in future events, using machine learning or the like. This may be accomplished using a variety of statistical techniques including modeling, machine learning, data mining, or the like.

[0062] One term for large, complex, historical data sets is Big Data. Examples of Big Data include web logs, social networks, blogs, system log files, call logs, customer data, user feedback, or the like. These data sets may often be so large and complex that they are awkward and difficult to work with using traditional tools. With technological advances in computing resources, including memory, storage, and computational power, along with frameworks and programming models for data-intensive distributed applications, the ability to collect, analyze and mine these huge repositories of structured, unstructured, and/or semi-structured data has only recently become possible.

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[0063] In certain embodiments, prediction may be applied through at least two general techniques: Regression and Classification.

[0064] Regression models attempt to fit a mathematical equation to approximate the relationship between the variables being analyzed. These models may include "Discrete Choice" models such as Logistic Regression, Multinomial Logistic Regression, Probit Regression, or the like. When factoring in time, Time Series models may be used, such as Auto Regression – AR, Moving Average – MA, ARMA, AR Conditional Heteroskedasticity - ARCH, Generalized ARCH - GARCH and Vector AR – VAR). Other models include Survival or Duration analysis, Classification and Regression Trees (CART), Multivariate Adaptive Regression Splines (MARS), and the like.

[0065] Classification is a form of artificial intelligence that uses computational power to execute complex algorithms in an effort to emulate human cognition. One underlying problem, however, remains: determining the set of all possible behaviors given all possible inputs is much too large to be included in a set of observed examples. Classification methods may include Neural Networks, Radial Basis Functions, Support Vector Machines, Naïve Bayes, k-Nearest Neighbors, Geospatial Predictive modeling, and the like.

[0066] Each of these forms of modeling make assumptions about the data set and model the given data, however, some models are more accurate than others and none of the models are ideal. Historically, using predictive analytics or other machine learning tools was a cumbersome and difficult process, often involving the engagement of a Data Scientist or other expert. Any easier-to-use tools or interfaces for general business users, however, typically fall short in that they still require "heavy lifting" by IT personnel in order to present and massage data and results. A Data Scientist typically must determine the optimal class of learning machines that would be the most applicable for a given data set, and rigorously test the selected hypothesis by first fine-tuning the learning machine parameters and second by evaluating results fed by trained data.

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[0067] The results module 102, in certain embodiments, generates machine learning ensembles or other machine learning program code for the clients 104, with little or no input from a Data Scientist or other expert, by generating a large number of learned functions from multiple different classes, evaluating, combining, and/or extending the learned functions, synthesizing selected learned functions, and organizing the synthesized learned functions into a machine learning ensemble. The results module 102, in one embodiment, services analysis requests for the clients 104 using the generated machine learning ensembles or other machine learning program code.

[0068] By generating a large number of learned functions, without regard to the effectiveness of the generated learned functions, without prior knowledge of the generated learned functions suitability, or the like, and evaluating the generated learned functions, in certain embodiments, the results module 102 may provide machine learning ensembles or other machine learning program code that are customized and finely tuned for a particular machine learning application, data from a specific client 104, or the like, without excessive intervention or fine-tuning. The results module 102, in a further embodiment, may generate and evaluate a large number of learned functions using parallel computing on multiple processors, such as a massively parallel processing (MPP) system or the like. Machine learning ensembles or other machine learning program code are described in greater detail below with regard to Figure 2B, Figure 3, Figure 4, and Figure 5.

[0069] The results module 102 may service machine learning requests to clients 104 locally, executing on the same host computing device as the results module 102, by providing an API to clients 104, receiving function calls from clients 104, providing a hardware command interface to clients 104, or otherwise providing a local channel 108 to clients 104. In a further embodiment, the results module 102 may service machine learning requests to clients 104 over a data network 106, such as a local area network

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(LAN), a wide area network (WAN) such as the Internet as a cloud service, a wireless network, a wired network, or another data network 106.

[0070] In the system 100 of Figure 1A, a plurality of results modules 102 are depicted in a collaborative configuration. One or more results modules 102 may operate in a collaborative configuration on a single computing device or client 104 (e.g., receiving user input and presenting machine learning results and/or other parameters to multiple users on a single device) or on multiple computing devices or clients 104 (e.g., receiving user input and presenting machine learning results and/or other parameters to multiple users on multiple devices) as illustrated in the depicted embodiment. In other embodiments, the system 100 may include a single results module 102 operating on a single computing device, with or without a data network 106 and other clients 104.

[0071] In the depicted embodiment, the results modules 102 are in communication over the data network 106 to display or otherwise present machine learning results to multiple users using electronic display devices 110 of different client computing devices 104, such as the depicted desktop computer, mobile phone, and tablet devices. In the depicted embodiment, one result module 102A (e.g., a central, primary, server, or master results module 102) displays collaborative group machine learning results on a first electronic display device 110A, based on user input such as object manipulations from several different users or client devices 104, while several additional results modules 102B (e.g., secondary, client, follower results modules 102B) display copies of the machine learning results, subsets of the machine learning results, or other machine learning parameters on client electronic display devices 110B.

[0072] Different client devices 104, in the depicted embodiment, display different subsets of the machine learning results or other parameters, which may include the input and/or output of different machine learning ensembles or other machine learning program code. For example, the results modules 102 may be used in a business meeting, a boardroom, or the like, with representatives from different departments or business units

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each viewing and manipulating separate machine learning inputs, results, and/or other parameters for machine learning ensembles or other machine learning program code generated specifically for their respective departments or business units, using enterprise data from the different departments or business units.

[0073] In a collaborative environment, the one or more results modules 102 may display or otherwise present, on a primary electronic display device 110A or one or more secondary electronic display devices 110B, an impact that an adjustment or manipulation of a machine learning input, result, and/or other parameter made by one user or other client 104 has on displayed machine learning results for another user or other client 104, based on different machine learning ensembles or other program code. For example, a user in a shipping department of a business may use a user interface of a results module 102 to propose a policy change, such as a change in shipping providers, a change in shipping dates, or the like. The one or more results modules 102 may display or otherwise present an impact of the proposed change of the shipping department to users from other departments, such as a customer service department, a sales department, an information technology (IT) department, or the like. In the example, a proposal to no longer ship orders on weekends may increase a number of complaints to a customer service department, decrease an effectiveness of an advertising campaign of a sales department, or the like and the one or more results modules 102 may display/present these impacts or other effects to one or more users on one or more electronic display devices 110.

[0074] Figure 1B depicts one embodiment of a graphical display 120 provided by a results module 102. In the depicted embodiment, the graphical display 120 comprises a graphical table such as a spreadsheet that displays data values in rows 134a-n and columns 122, 124, 126, 128, 130, 132. The columns 122, 124, 126, 128, 130, 132, in the depicted embodiment, include inputs and outputs (e.g., parameters and/or results) for machine learning, such as a machine learning ensemble or other machine learning

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program code, such as the depicted goal 122, first feature 124, second feature 126, action 128, target 130, and confidence metric 132 for each of a first instance 134a and a second instance 134n (e.g., rows A-N). A results module 202 may provide the graphical display 120, and monitor the graphical display 120 for user input. In response to a user entering, changing, and/or updating a data value for an entry in the table of the graphical display 120, a results module 202 may update other entries in the table according to the data value provided by the user, using machine learning, such as the pre-computed and/or pre-cached machine learning results described below with regard to the pre-compute module 208.

[0075] A data value in an entry for a column 122, 124, 126, 128, 130, 132 or feature may comprise an attribute. Each column 122, 124, 126, 128, 130, 132 or feature may be associated with or support a plurality of attributes, defined by minimum and maximum values, data types (e.g., string, integer, boolean, character, float, or the like), a set of defined values, or another set of attribute values. In certain embodiments, the supported attribute values for a column 122, 124, 126, 128, 130, 132 or feature may depend on a selected goal 122.

[0076] For example, in the depicted embodiment, the supported attributes or values for the features 124, 126 vary based on the selected goal 122, with the first feature 124 of the first instance 134a comprising a zip code (e.g., a customer zip code, a store zip code), the second feature 126 comprising an age group (e.g., a customer age group, a target age group), the first feature 124 of the second instance 134n comprising a dollar amount (e.g., a purchase amount, a profit amount, a goal amount, an action cost, a budget), and the second feature 126 of the second instance 134n comprising an integer value (e.g., a target group size, a number of sales, a number of actions).

[0077] In the depicted embodiment, the goals 122 comprise business goals or desired outcomes, including goals 122 to double sales or to increase repeat purchases. A goal 122, as used herein, may include a desired, intended, or selected outcome or result of

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one or more actions or, action plans, or other events. A goal 122 may include a business goal (e.g., a sales goal, a marketing goal, a corporate goal, an IT goal, a customer service goal, or the like) a personal goal, a medical goal, a fitness goal, a political goal, an organization goal, a team goal, an economic goal, a short-term goal, a long-term goal, a custom goal, a predefined goal, or another type of goal, based on a context in which the one or more results modules 102 operate.

[0078] In one embodiment, a goal 122 may be associated with a machine learning ensemble or other machine learning program code. For example, each supported goal 122 may be associated with or represent a different generated machine learning ensemble, a different set of multiple machine learning ensembles, or the like. The machine learning module 212, as described below, may generate machine learning ensembles or other machine learning program code for different goals 122 based on a user or organization's own data, so that the one or more results modules 102 may also display machine learning results customized and determined based on a user or organization's own historical data, customer data, or the like.

[0079] The one or more results modules 102, in certain embodiments, may allow a user to adjust, change, or customize data entries for a goal 122, a feature 124, 126, an action 128, a target 130, and/or a confidence metric 132 for one or more of the instances 134a-n. In one embodiment, a results module 102 may support user input for a single column 122, 124, 126, 128, 130, 132 at a time per instance 134a-n, and may determine and display associated machine learning parameters/results for the other columns 122, 124, 126, 128, 130, 132. In a further embodiment, a results module 102 may support user input for up to all but one of the columns 122, 124, 126, 128, 130, 132 at a time per instance 134a-n, and may determine and display associated machine learning parameters/results for the one or more other columns 122, 124, 126, 128, 130, 132.

[0080] For example, in one embodiment, a user may select a goal 122 for an instance 134a-n, may input a data value for one or more features 124, 126, and the results

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module 102 may determine and dynamically display a recommended action 128 to achieve the goal 122, one or more targets 130 for the recommended action 128, and a confidence metric 132 representing a likelihood that the recommended action 128 for the one or more targets 130 will yield the associated goal 122. In the depicted embodiment, the results module 102 has determined, using a results data structure or other machine learning, has determined and displayed a first instance 134a, indicating that to achieve a goal 122 of doubling sales for 18-25 year olds 126 in the 22313 zip code 124, a user should perform an action 128 of offering a 20% off discount to a set of target 130 customers (indicated by the depicted drop-down list) including "bob@email.com" and that the recommended action 128 has been determined to have a 74% likelihood of success 132.

[0081] For the second instance 134n, in the depicted embodiment, the results module 102 has determined and displayed that to achieve a goal 122 of creating or increasing repeat buys for a total 124 of $12,000 additional sales, a user should send a buy-one-get-one (BOGO) free email 128 to a target set 130 of 683,174 people 126 (e.g., from a customer list and/or database), including "sue@email.com" and others indicated by the depicted drop-down list, and that the recommended action 128 has an associated confidence metric 132 of 62%. The depicted instances 134a-n and features 122, 124, 126, 128, 130, 132 of Figure 1B are for purposes of illustration only, and other embodiments may include different presentations and arrangements of machine learning inputs, outputs, results, and/or other parameters.

[0082] In this manner, the one or more results modules 102 may provide a spreadsheet or other table populated with machine learning inputs, outputs, results, and/or other parameters and dynamically update the displayed parameters as a user provides user input changing, updating, or adding data values for displayed parameters in the spreadsheet or other table. In certain embodiments, the one or more results modules 102 may update displayed parameters substantially in real-time, using pre-computed or pre-

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cached machine learning inputs, outputs, results, and/or other parameters, thereby providing an interactive data visualization for machine learning. The one or more results modules 102 may display machine learning inputs, outputs, results, and/or other parameters based on a user's own data, enabling the user to visualize patterns and relationships and to determine actions and goals based on the patterns and relationships.

[0083] Figure 1C depicts another embodiment of a graphical display 130 provided by the results module 102. In the depicted embodiment, the one or more results modules 102 display machine learning inputs, results, and/or other parameters as objects 148, such as the displayed circles. In other embodiments, the one or more results modules 102 may display machine learning inputs, results, and/or other parameters as one or more other geometric shapes (e.g., squares, triangles, rectangles, ovals, stars, or the like); as a graphical metaphor or image for a user, a business, or a product (e.g., an icon, a logo, a product image, or the like); and/or as a dynamic interactive graph, chart, or plot (e.g., a pie chart, bar chart, histogram, line chart, tree chart, scatter plot, or the like) that dynamically reform or readjust with new values for machine learning inputs, results, and/or other parameters based on user input.

[0084] In the depicted embodiment, the one or more results modules 102 display a plurality of actions 142, each with associated machine learning parameters 144, an overall goal 150 or outcome 150, and a displayed object 148. An action 142 of "email 20% off" is selected in the depicted embodiment, with machine learning parameters 144 including an action count (e.g., size of a target set) of 480,880, a cost of $6,000 for performing the action, a goal revenue of $500,000, a return on investment (ROI) of $62,000, and a confidence metric of 60%. In the depicted embodiment, the "count" machine learning parameter 144 is selected, and a slider 146 graphical user interface element corresponding to the machine learning parameter 144 is displayed, allowing a user to adjust the "count" machine learning parameter 144, changing the value from 480,880 to a different value. In other embodiments, a text box, one or more radio

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buttons, a dropdown list, checkboxes, or other graphical user interface elements may be used to receive user input adjusting a machine learning parameter 144. In one embodiment, the one or more results modules 102 may dynamically display a slider 146 or another graphical user interface element for whichever action 142 and/or machine learning parameter 144 is currently selected or active (circumscribed with bold lines in the depicted embodiment).

[0085] In the depicted embodiment, the one or more results modules 142 displays a plurality of actions 142, that when taken, are predicted to cumulatively accomplish the goal 150 or outcome 150, based on a machine learning analysis. In other embodiments, the one or more results modules 102 may recommend a single action 142 for a goal 150, predict multiple outcomes 150 or goals 150 for a single action 142, or the like.

[0086] In one embodiment, the one or more results modules 102 may receive user input as user manipulation of a displayed object 148, such as an adjustment to a size of the displayed object 148, an adjustment to a vertical position of the displayed object 148, an adjustment to a horizontal position of the displayed object 148, an adjustment to an opacity of the displayed object 148, an adjustment to a color of the displayed object 148, an adjustment to a shape of displayed object 148, an adjustment to shading of displayed object 148, a text entry in a text box for the displayed object 148, user interaction with an animation for the displayed object 148, or the like.

[0087] Supported manipulations to a displayed object 148, in the depicted embodiment, are each associated with a machine learning parameter 144 and each different object 148 is associated with a different action 142. For example, a size of a displayed object 148 may correspond to a size of a result set or target count for a machine learning parameter 144, a vertical position (e.g., relative to the percentage scale of the Y axis) of a displayed object 148 may correspond to an action count for a machine learning parameter 144 or the like, a horizontal position (e.g., relative to the time scale of the X axis) of a displayed object 148 may correspond to an execution time or date for a

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machine learning parameter 144 such as an action 142 or the like, an opacity, color, shading, and/or border of a displayed object 142 may correspond to a confidence metric for a machine learning parameter 144 or the like.

[0088] In embodiments where an electronic display device 110 comprises a touchscreen or other touch interface, direct touch manipulation of a displayed object 148 (or mouse or keyboard manipulation, in embodiments without a touch interface) may provide a user with an experiential understanding of the user's data and associated machine learning results, predictions, and/or recommendations, to a greater degree than may otherwise be possible with a static list of numbers.

[0089] The one or more results modules 102 may dynamically update the displayed actions 142, the displayed machine learning parameters 144, and/or the displayed goal 150 or outcome in response to user input manipulating or adjusting one of the values 142, 144, 148, 150. For example, if a user changes a value for a count, cost, goal, ROI, confidence, or other attribute/machine learning parameter 144, such as decreasing the displayed action count 144 for the "email 20% off" action, a results module 102 may update attributes/machine learning parameters for other actions 142, such as increasing action counts for one or more other actions 142, in an optimal machine learning manner, to satisfy the goal 150 or outcome.

[0090] While a single screen view is illustrated in the depicted embodiment, in certain embodiments, in response to double clicking, right clicking, touching and holding, or another predefined user input to a graphical user interface element, the one or more results modules 102 may display another screen view, with additional information regarding a machine learning parameter 144, an action 142, a displayed object 148, or the like. For example, the one or more results modules 102 may display a target list for one or more actions 142, an action plan, or the like. In certain embodiments, the one or more results modules 102 may display or provide an export button or other graphical user interface element, and may export a target list, an action plan, and/or other information in

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a different format (e.g., text document, PDF, email, database file, spreadsheet, or the like) in response to user input.

[0091] Figure 2A depicts another embodiment of the results module 102. In the depicted embodiment, the results module 102 includes an input module 202, a display module 204, and an update module 206.

[0092] In one embodiment, the input module 202 is configured to receive user input identifying a value for a machine learning parameter. A machine learning parameter, as used herein, may include an input for machine learning (e.g., an instance for one or more features, an attribute for a feature, user workload data, business data, customer data, enterprise data, or the like), an output for machine learning (e.g., a result, a classification, a confidence metric, an inferred function, a regression function, an answer, a prediction, a recognized pattern, a rule, a recommendation, an evaluation, an action, or the like), a goal or action for which specific machine learning was generated, or another data value associated with machine learning.

[0093] The input module 202, in a further embodiment, may receive user input as an adjustment to a slider graphical user interface element corresponding to the machine learning parameter, as a user entry in a graphical table, as a user manipulation of a displayed object, or using another graphical user interface element. For example, the user input may include an adjustment to a size of a displayed object, where the size of the displayed object corresponds to a size of a result set for a machine learning parameter, or the like; an adjustment to a vertical position of a displayed object where the vertical position corresponds to an action count for a machine learning parameter, or the like; an adjustment to a horizontal position of a displayed object where the horizontal position corresponds to a time for a machine learning parameter, or the like; and/or an adjustment to an opacity of a displayed object where the opacity corresponds to a confidence metric for a machine learning parameter an adjustment to a color of a displayed object, an adjustment to a shape of a displayed object, an adjustment to shading of a displayed

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object, a text entry in a text box for a displayed object, user interaction with an animation for a displayed object, or the like.

[0094] In certain embodiments, the input module 202 is configured to receive user input from multiple users (e.g., clients 104) identifying values for one or more machine learning parameters for one or more predictive programs, such as the machine learning ensembles described below. The input module may receive user input from separate client devices for multiple users 104 over a data network 106, from a shared interface for multiple users 104 on a single device, or the like as described above with regard to Figure 1A. The input module 202, in certain embodiments, may cooperate with an operating system, a device driver, an input/output (I/O) interface, or the like to receive notification of user input, data values or manipulations of user input, or other user input information.

[0095] In one embodiment, the display module 204 is configured to display one or more machine learning inputs, outputs, results, or other parameters for an identified machine learning parameter adjusted by a user or another client 104 in response to the input module 202 receiving user input as described above. The machine learning module 212 described below may determine one or more machine learning results using machine learning (e.g., a machine learning ensemble or another predictive program). The pre-compute module 208 described below may pre-cache or store pre-computed or simulated machine learning results, indexed by machine learning parameters, and the display module 204 may cooperate with the pre-compute module 208 to locate machine learning results for one or more identified machine learning parameters.

[0096] The display module 204, in certain embodiments, may be configured to display one or more attributes of a data set used by the machine learning to determine the one or more machine learning results and one or more impact metrics for each displayed attribute, one or more of which may be stored by the pre-compute module 208 in a results data structure, or the like. For example, the display module 204 may display a list,

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ranking, and/or statistics associated with specific features, instances, or other attributes indicating how predictive an attribute was (e.g., an impact), what contribution an attribute made to a result, a frequency that an attribute occurred, a coverage or range for an attribute in the data set, or the like.

[0097] In one embodiment, a machine learning parameter comprises an input and/or an output of the machine learning adjusted by user input. Machine learning results, in certain embodiments, comprise an input and/or an output of the machine learning determined based on an adjusted machine learning parameter. Therefore, a machine learning parameter and/or a machine learning result may comprise an attribute of a feature, a target value for a goal, an action relating to a goal, a confidence metric, a target of an action, or the like as described above.

[0098] The display module 204, in certain embodiments, is configured to display predetermined machine learning results to multiple users based on identified values. The display module 204 may be configured to display one or more machine learning results as entries in a graphical table, as an adjustment to a slider graphical user interface element, as an attribute of a displayed object, or the like as described above. The display module 204, in certain embodiments, may provide animated replay and/or recording capabilities, allowing a user to record visualizations of machine learning results and/or other parameters for later viewing, preserving user manipulations and adjustments and updates to the displayed visualizations by the update module 206. In a further embodiment, the display module 204 may provide a graphical user interface element for scrubbing or looping a display of machine learning results and/or other parameters. For example, the display module 204 may provide a scrubbing slider which a user may drag to adjust a time of an animated display of machine learning results, to re-watch or further interact with the visualization and/or previous user input to machine learning parameters. Such tools may supplement or improve the experiential nature of the visualization provided by the display module 204.

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[0099] In one embodiment, the update module 206 is configured to dynamically update one or more machine learning inputs, outputs, results, and/or other parameters displayed by the display module 204. The update module 206 may updated displayed machine learning inputs, outputs, results, and/or other parameters in response to the input module 202 receiving additional user input identifying a value for a machine learning parameter, such as an adjusted or updated value.

[0100] As described below with regard to the recommendation module 214, the display module 204 may initially display recommended or optimal machine learning inputs, outputs, results, or other parameters. The update module 206 may monitor user input from the input module 202 to detect or otherwise receive user adjustments or updates to displayed machine learning parameters. The update module 206 may determine adjustments, updates, or other changes to the remaining machine learning inputs, outputs, results, and/or other parameters based on the user input adjusting or updating the displayed parameters.

[0101] As described below with regard to the pre-compute module, the update module 206 may lookup adjusted or updated machine learning inputs, outputs, results, and/or other parameters in a results data structure, to determine what adjustments or updates to make to the displayed machine learning inputs, outputs, results, or other parameters. In other embodiments, without a pre-compute module 208 or the like, the update module 206 may input one or more machine learning parameters into machine learning, such as a machine learning ensemble or other predictive program, to determine adjustments or updates to make to the displayed machine learning inputs, outputs, results, or other parameters, however processing data with machine learning during runtime of a graphical user interface may be significantly slower (e.g., hours and/or days) than pre-computing and/or pre-caching machine learning parameters and/or results.

[0102] Figure 2B depicts a further embodiment of the results module 102. In the depicted embodiment, the results module 102 includes the input module 202, the display

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module 204, and the update module 206, and further includes a pre-compute module 208, a predictive compiler module 210, a machine learning module 212, a recommendation module 214, and a collaboration module 216.

[0103] In one embodiment, the pre-compute module 208 is configured to predetermine, pre-compute, and/or pre-cache, using machine learning, permutations of machine learning results and/or other machine learning parameters. For example, the pre-compute module 208 may pre-compute and/or pre-cache machine learning results at predefined increments (e.g., 1% increments, 5% increments, time based increments, integer increments, or the like) between a minimum value for a machine learning parameter and a maximum value for a machine learning parameter, or the like. In certain embodiments, the pre-compute module 208 may simulate or predetermine permutations of machine learning results prior to the input module 202 receiving user input (e.g., prior to runtime for the input module 202), so that cached machine learning results are available for the display module 204 to display.

[0104] In certain embodiments, the pre-compute module 208 may use actual workload data, historical data, or the like from a user to pre-compute and/or pre-cache machine learning results for the user. For example, the pre-compute module 208 may process historical sales information, customer information, or the like for a user using machine learning to pre-determine and cache machine learning results for a business goal of the user. The pre-compute module 208 may fill-in, pad, or simulate missing values in a user's data, in order to pre-compute each possible machine learning result for the user. In certain embodiments, the pre-compute module 208 may fill-in, pad, or simulate missing values in a user's data based on the user's data, to maintain one or more existing attributes of the data (e.g., percentage of customers with a specified gender, geographic locations of customers, order amounts). For example, the pre-compute module 208 may fill-in, pad, or simulate missing values by determining a most likely value for the missing values using machine learning.

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[0105] The pre-compute module 208 may configured to cache predetermined permutations of machine learning results for the update module 206 in a results data structure indexed by machine learning parameters, facilitating lookups of machine learning results for user-adjusted machine learning parameters. A results data structure may comprise a lookup table, a tree, a linked list, a heap, a stack, or another indexable data structure. The pre-compute module 208 may populate the results data structure prior to the input module 202 receiving user input identifying a value for a machine learning parameter, so that the display module 204 and/or the update module 206 may dynamically display corresponding machine learning parameters and machine learning results from the results data structure in response to user input selecting a value for a machine learning parameter, a machine learning result, or the like.

[0106] The pre-compute module 208, in one embodiment, is configured to predetermine, using multiple predictive programs such as machine learning ensembles or the like, permutations of machine learning results for each of the predictive programs at predefined increments between minimum values for machine learning parameters and maximum values for the machine learning parameters. In this manner, the pre-compute module 208 may allow the collaboration module 216 to determine the impact of changes or adjustments to machine learning parameters on the machine learning results of other predictive programs, in a collaborative environment or the like. For example, the pre-compute module 208 may compare definitions of features, instances or attributes of features, or the like for data from different users, for different machine learning ensembles or predictive programs, and may determine which machine learning parameters are the same (e.g., each data set includes a zip code or another common feature or parameter).

[0107] In one embodiment, the predictive compiler module 210 is configured to generate machine learning, such as a machine learning ensemble 222 with program code for a plurality of learned functions from multiple machine learning classes, or the like, as

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described below. The program code generated by the predictive compiler module 210 may be configured to execute on a predictive virtual machine, on a host processor, or the like to predict machine learning results based on one or more machine learning parameters.

[0108] As described below with regard to Figures 3 and 4, the machine learning module 212 may be configured to generate machine learning using a compiler/virtual machine paradigm. The machine learning module 212 may generate a machine learning ensemble with executable program code (e.g., program script instructions, assembly code, byte code, object code, or the like) for multiple learned functions, a metadata rule set, an orchestration module, or the like. The machine learning module 212 may provide a predictive virtual machine or interpreter configured to execute the program code of a machine learning ensemble with workload data to provide one or more machine learning results.

[0109] In one embodiment, the machine learning module 212 is configured to cooperate with the pre-compute module 208 or the like to determine machine learning results from one or more machine learning ensembles 222a-b or other predictive programs based on machine learning parameters.

[0110] In one embodiment, the recommendation module 214 is configured to select a suggested or optimal set of machine learning results for the display module 204 to initially display to a user 104 prior to the input module 202 receiving user input, as a set of default or recommended machine learning results or the like.

[0111] In one embodiment, the collaboration module 216 is configured to determine an impact on one or more machine learning results based on different user inputs received from different users, for multiple machine learning ensembles 222a-b or other different predictive programs. For example, the input module 202 may be configured to receive different user input from different users identifying different values for different machine learning parameters. The display module 204 may be configured to

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display multiple sets of machine learning results to multiple users 104 and the update module 206 may be configured to dynamically update displayed sets of one or more machine learning results in response to user input from one or more users.

[0112] The collaboration module 216 may be configured to determine an impact on machine learning results from one or more machine learning ensembles 222a-c or other predictive programs based on an identified value for a machine learning parameter. Different users may provide user input identifying values for different predictive programs such as different machine learning ensembles 222. For example, users from different corporate units or departments may each manipulate or adjust machine learning parameters for a machine learning ensemble 222 or other predictive program for their respective unit or department. The display module 204 may be configured to display the impact on the machine learning results on a shared display 110 for multiple users, to display machine learning results for different machine learning ensembles 222a-c or other predictive programs on different displays 110A-B for multiple users, or the like.

[0113] Figure 3 depicts one embodiment of a machine learning module 212. The machine learning module 212 of Figure 3, in certain embodiments, may be substantially similar to the predictive compiler module 210 described above with regard to Figure 2B. In the depicted embodiment, the machine learning module 212 includes a data receiver module 300, a function generator module 301, a machine learning compiler module 302, a feature selector module 304 a predictive correlation module 318, and a machine learning ensemble 222. The machine learning compiler module 302, in the depicted embodiment, includes a combiner module 306, an extender module 308, a synthesizer module 310, a function evaluator module 312, a metadata library 314, and a function selector module 316. The machine learning ensemble 222, in the depicted embodiment, includes an orchestration module 320, a synthesized metadata rule set 322, and synthesized learned functions 324.

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[0114] The data receiver module 300, in certain embodiments, is configured to receive client data, such as training data, test data, workload data, or the like, from a client 104, either directly or indirectly. The data receiver module 300, in various embodiments, may receive data over a local channel 108 such as an API, a shared library, a hardware command interface, or the like; over a data network 106 such as wired or wireless LAN, WAN, the Internet, a serial connection, a parallel connection, or the like. In certain embodiments, the data receiver module 300 may receive data indirectly from a client 104 through an intermediate module that may pre-process, reformat, or otherwise prepare the data for the machine learning module 212. The data receiver module 300 may support structured data, unstructured data, semi-structured data, or the like.

[0115] One type of data that the data receiver module 300 may receive, as part of a new ensemble request or the like, is initialization data. The machine learning module 212, in certain embodiments, may use initialization data to train and test learned functions from which the machine learning module 212 may build a machine learning ensemble 222. Initialization data may comprise historical data, statistics, Big Data, customer data, marketing data, computer system logs, computer application logs, data networking logs, or other data that a client 104 provides to the data receiver module 300 with which to build, initialize, train, and/or test a machine learning ensemble 222.

[0116] Another type of data that the data receiver module 300 may receive, as part of an analysis request or the like, is workload data. The machine learning module 212, in certain embodiments, may process workload data using a machine learning ensemble 222 to obtain a result, such as a classification, a confidence metric, an inferred function, a regression function, an answer, a prediction, a recognized pattern, a rule, a recommendation, an evaluation, or the like. Workload data for a specific machine learning ensemble 222, in one embodiment, has substantially the same format as the initialization data used to train and/or evaluate the machine learning ensemble 222. For example, initialization data and/or workload data may include one or more features. As

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used herein, a feature may comprise a column, category, data type, attribute, characteristic, label, or other grouping of data. For example, in embodiments where initialization data and/or workload data that is organized in a table format, a column of data may be a feature. Initialization data and/or workload data may include one or more instances of the associated features. In a table format, where columns of data are associated with features, a row of data is an instance.

[0117] As described below with regard to Figure 4, in one embodiment, the data receiver module 300 may maintain client data, such as initialization data and/or workload data, in a data repository 406, where the function generator module 301, the machine learning compiler module 302, or the like may access the data. In certain embodiments, as described below, the function generator module 301 and/or the machine learning compiler module 302 may divide initialization data into subsets, using certain subsets of data as training data for generating and training learned functions and using certain subsets of data as test data for evaluating generated learned functions.

[0118] The function generator module 301, in certain embodiments, is configured to generate a plurality of learned functions based on training data from the data receiver module 300. A learned function, as used herein, comprises a computer readable code that accepts an input and provides a result. A learned function may comprise a compiled code, a script, text, a data structure, a file, a function, or the like. In certain embodiments, a learned function may accept instances of one or more features as input, and provide a result, such as a classification, a confidence metric, an inferred function, a regression function, an answer, a prediction, a recognized pattern, a rule, a recommendation, an evaluation, or the like. In another embodiment, certain learned functions may accept instances of one or more features as input, and provide a subset of the instances, a subset of the one or more features, or the like as an output. In a further embodiment, certain learned functions may receive the output or result of one or more other learned functions as input, such as a Bayes classifier, a Boltzmann machine, or the like.

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[0119] The function generator module 301 may generate learned functions from multiple different machine learning classes, models, or algorithms. For example, the function generator module 301 may generate decision trees; decision forests; kernel classifiers and regression machines with a plurality of reproducing kernels; non-kernel regression and classification machines such as logistic, CART, multi-layer neural nets with various topologies; Bayesian-type classifiers such as Naïve Bayes and Boltzmann machines; logistic regression; multinomial logistic regression; probit regression; AR; MA; ARMA; ARCH; GARCH; VAR; survival or duration analysis; MARS; radial basis functions; support vector machines; k-nearest neighbors; geospatial predictive modeling; and/or other classes of learned functions.

[0120] In one embodiment, the function generator module 301 generates learned functions pseudo-randomly, without regard to the effectiveness of the generated learned functions, without prior knowledge regarding the suitability of the generated learned functions for the associated training data, or the like. For example, the function generator module 301 may generate a total number of learned functions that is large enough that at least a subset of the generated learned functions are statistically likely to be effective. As used herein, pseudo-randomly indicates that the function generator module 301 is configured to generate learned functions in an automated manner, without input or selection of learned functions, machine learning classes or models for the learned functions, or the like by a Data Scientist, expert, or other user.

[0121] The function generator module 301, in certain embodiments, generates as many learned functions as possible for a requested machine learning ensemble 222, given one or more parameters or limitations. A client 104 may provide a parameter or limitation for learned function generation as part of a new ensemble request or the like to an interface module 402 as described below with regard to Figure 4, such as an amount of time; an allocation of system resources such as a number of processor nodes or cores, or an amount of volatile memory; a number of learned functions; runtime constraints on the

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requested ensemble 222 such as an indicator of whether or not the requested ensemble 222 should provide results in real-time; and/or another parameter or limitation from a client 104.

[0122] The number of learned functions that the function generator module 301 may generate for building a machine learning ensemble 222 may also be limited by capabilities of the system 100, such as a number of available processors or processor cores, a current load on the system 100, a price of remote processing resources over the data network 106; or other hardware capabilities of the system 100 available to the function generator module 301. The function generator module 301 may balance the hardware capabilities of the system 100 with an amount of time available for generating learned functions and building a machine learning ensemble 222 to determine how many learned functions to generate for the machine learning ensemble 222.

[0123] In one embodiment, the function generator module 301 may generate at least 50 learned functions for a machine learning ensemble 222. In a further embodiment, the function generator module 301 may generate hundreds, thousands, or millions of learned functions, or more, for a machine learning ensemble 222. By generating an unusually large number of learned functions from different classes without regard to the suitability or effectiveness of the generated learned functions for training data, in certain embodiments, the function generator module 301 ensures that at least a subset of the generated learned functions, either individually or in combination, are useful, suitable, and/or effective for the training data without careful curation and fine tuning by a Data Scientist or other expert.

[0124] Similarly, by generating learned functions from different machine learning classes without regard to the effectiveness or the suitability of the different machine learning classes for training data, the function generator module 301, in certain embodiments, may generate learned functions that are useful, suitable, and/or effective for the training data due to the sheer amount of learned functions generated from the

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different machine learning classes. This brute force, trial-and-error approach to generating learned functions, in certain embodiments, eliminates or minimizes the role of a Data Scientist or other expert in generation of a machine learning ensemble 222.

[0125] The function generator module 301, in certain embodiments, divides initialization data from the data receiver module 300 into various subsets of training data, and may use different training data subsets, different combinations of multiple training data subsets, or the like to generate different learned functions. The function generator module 301 may divide the initialization data into training data subsets by feature, by instance, or both. For example, a training data subset may comprise a subset of features of initialization data, a subset of features of initialization data, a subset of both features and instances of initialization data, or the like. Varying the features and/or instances used to train different learned functions, in certain embodiments, may further increase the likelihood that at least a subset of the generated learned functions are useful, suitable, and/or effective. In a further embodiment, the function generator module 301 ensures that the available initialization data is not used in its entirety as training data for any one learned function, so that at least a portion of the initialization data is available for each learned function as test data, which is described in greater detail below with regard to the function evaluator module 312 of Figure 3.

[0126] In one embodiment, the function generator module 301 may also generate additional learned functions in cooperation with the machine learning compiler module 302. The function generator module 301 may provide a learned function request interface, allowing the machine learning compiler module 302 or another module, a client 104, or the like to send a learned function request to the function generator module 301 requesting that the function generator module 301 generate one or more additional learned functions. In one embodiment, a learned function request may include one or more attributes for the requested one or more learned functions. For example, a learned function request, in various embodiments, may include a machine learning class for a

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requested learned function, one or more features for a requested learned function, instances from initialization data to use as training data for a requested learned function, runtime constraints on a requested learned function, or the like. In another embodiment, a learned function request may identify initialization data, training data, or the like for one or more requested learned functions and the function generator module 301 may generate the one or more learned functions pseudo-randomly, as described above, based on the identified data.

[0127] The machine learning compiler module 302, in one embodiment, is configured to form a machine learning ensemble 222 using learned functions from the function generator module 301. As used herein, a machine learning ensemble 222 comprises an organized set of a plurality of learned functions. Providing a classification, a confidence metric, an inferred function, a regression function, an answer, a prediction, a recognized pattern, a rule, a recommendation, or another result using a machine learning ensemble 222, in certain embodiments, may be more accurate than using a single learned function.

[0128] The machine learning compiler module 302 is described in greater detail below with regard to Figure 3. The machine learning compiler module 302, in certain embodiments, may combine and/or extend learned functions to form new learned functions, may request additional learned functions from the function generator module 301, or the like for inclusion in a machine learning ensemble 222. In one embodiment, the machine learning compiler module 302 evaluates learned functions from the function generator module 301 using test data to generate evaluation metadata. The machine learning compiler module 302, in a further embodiment, may evaluate combined learned functions, extended learned functions, combined-extended learned functions, additional learned functions, or the like using test data to generate evaluation metadata.

[0129] The machine learning compiler module 302, in certain embodiments, maintains evaluation metadata in a metadata library 314, as described below with regard

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to Figures 3 and 4. The machine learning compiler module 302 may select learned functions (e.g. learned functions from the function generator module 301, combined learned functions, extended learned functions, learned functions from different machine learning classes, and/or combined-extended learned functions) for inclusion in a machine learning ensemble 222 based on the evaluation metadata. In a further embodiment, the machine learning compiler module 302 may synthesize the selected learned functions into a final, synthesized function or function set for a machine learning ensemble 222 based on evaluation metadata. The machine learning compiler module 302, in another embodiment, may include synthesized evaluation metadata in a machine learning ensemble 222 for directing data through the machine learning ensemble 222 or the like.

[0130] In one embodiment, the feature selector module 304 determines which features of initialization data to use in the machine learning ensemble 222, and in the associated learned functions, and/or which features of the initialization data to exclude from the machine learning ensemble 222, and from the associated learned functions. As described above, initialization data, and the training data and test data derived from the initialization data, may include one or more features. Learned functions and the machine learning ensembles 222 that they form are configured to receive and process instances of one or more features. Certain features may be more predictive than others, and the more features that the machine learning compiler module 302 processes and includes in the generated machine learning ensemble 222, the more processing overhead used by the machine learning compiler module 302, and the more complex the generated machine learning ensemble 222 becomes. Additionally, certain features may not contribute to the effectiveness or accuracy of the results from a machine learning ensemble 222, but may simply add noise to the results.

[0131] The feature selector module 304, in one embodiment, cooperates with the function generator module 301 and the machine learning compiler module 302 to evaluate the effectiveness of various features, based on evaluation metadata from the

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metadata library 314 described below. For example, the function generator module 301 may generate a plurality of learned functions for various combinations of features, and the machine learning compiler module 302 may evaluate the learned functions and generate evaluation metadata. Based on the evaluation metadata, the feature selector module 304 may select a subset of features that are most accurate or effective, and the machine learning compiler module 302 may use learned functions that utilize the selected features to build the machine learning ensemble 222. The feature selector module 304 may select features for use in the machine learning ensemble 222 based on evaluation metadata for learned functions from the function generator module 301, combined learned functions from the combiner module 306, extended learned functions from the extender module 308, combined extended functions, synthesized learned functions from the synthesizer module 310, or the like.

[0132] In a further embodiment, the feature selector module 304 may cooperate with the machine learning compiler module 302 to build a plurality of different machine learning ensembles 222 for the same initialization data or training data, each different machine learning ensemble 222 utilizing different features of the initialization data or training data. The machine learning compiler module 302 may evaluate each different machine learning ensemble 222, using the function evaluator module 312 described below, and the feature selector module 304 may select the machine learning ensemble 222 and the associated features which are most accurate or effective based on the evaluation metadata for the different machine learning ensembles 222. In certain embodiments, the machine learning compiler module 302 may generate tens, hundreds, thousands, millions, or more different machine learning ensembles 222 so that the feature selector module 304 may select an optimal set of features (e.g. the most accurate, most effective, or the like) with little or no input from a Data Scientist, expert, or other user in the selection process.

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[0133] In one embodiment, the machine learning compiler module 302 may generate a machine learning ensemble 222 for each possible combination of features from which the feature selector module 304 may select. In a further embodiment, the machine learning compiler module 302 may begin generating machine learning ensembles 222 with a minimal number of features, and may iteratively increase the number of features used to generate machine learning ensembles 222 until an increase in effectiveness or usefulness of the results of the generated machine learning ensembles 222 fails to satisfy a feature effectiveness threshold. By increasing the number of features until the increases stop being effective, in certain embodiments, the machine learning compiler module 302 may determine a minimum effective set of features for use in a machine learning ensemble 222, so that generation and use of the machine learning ensemble 222 is both effective and efficient. The feature effectiveness threshold may be predetermined or hard coded, may be selected by a client 104 as part of a new ensemble request or the like, may be based on one or more parameters or limitations, or the like.

[0134] During the iterative process, in certain embodiments, once the feature selector module 304 determines that a feature is merely introducing noise, the machine learning compiler module 302 excludes the feature from future iterations, and from the machine learning ensemble 222. In one embodiment, a client 104 may identify one or more features as required for the machine learning ensemble 222, in a new ensemble request or the like. The feature selector module 304 may include the required features in the machine learning ensemble 222, and select one or more of the remaining optional features for inclusion in the machine learning ensemble 222 with the required features.

[0135] In a further embodiment, based on evaluation metadata from the metadata library 314, the feature selector module 304 determines which features from initialization data and/or training data are adding noise, are not predictive, are the least effective, or the like, and excludes the features from the machine learning ensemble 222. In other embodiments, the feature selector module 304 may determine which features enhance the

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quality of results, increase effectiveness, or the like, and selects the features for the machine learning ensemble 222.

[0136] In one embodiment, the feature selector module 304 causes the machine learning compiler module 302 to repeat generating, combining, extending, and/or evaluating learned functions while iterating through permutations of feature sets. At each iteration, the function evaluator module 312 may determine an overall effectiveness of the learned functions in aggregate for the current iteration's selected combination of features. Once the feature selector module 304 identifies a feature as noise introducing, the feature selector module may exclude the noisy feature and the machine learning compiler module 302 may generate a machine learning ensemble 222 without the excluded feature. In one embodiment, the predictive correlation module 318 determines one or more features, instances of features, or the like that correlate with higher confidence metrics (e.g. that are most effective in predicting results with high confidence). The predictive correlation module 318 may cooperate with, be integrated with, or otherwise work in concert with the feature selector module 304 to determine one or more features, instances of features, or the like that correlate with higher confidence metrics. For example, as the feature selector module 304 causes the machine learning compiler module 302 to generate and evaluate learned functions with different sets of features, the predictive correlation module 318 may determine which features and/or instances of features correlate with higher confidence metrics, are most effective, or the like based on metadata from the metadata library 314.

[0137] The predictive correlation module 318, in certain embodiments, is configured to harvest metadata regarding which features correlate to higher confidence metrics, to determine which feature was predictive of which outcome or result, or the like. In one embodiment, the predictive correlation module 318 determines the relationship of a feature's predictive qualities for a specific outcome or result based on each instance of a particular feature. In other embodiments, the predictive correlation

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module 318 may determine the relationship of a feature's predictive qualities based on a subset of instances of a particular feature. For example, the predictive correlation module 318 may discover a correlation between one or more features and the confidence metric of a predicted result by attempting different combinations of features and subsets of instances within an individual feature's dataset, and measuring an overall impact on predictive quality, accuracy, confidence, or the like. The predictive correlation module 318 may determine predictive features at various granularities, such as per feature, per subset of features, per instance, or the like.

[0138] In one embodiment, the predictive correlation module 318 determines one or more features with a greatest contribution to a predicted result or confidence metric as the machine learning compiler module 302 forms the machine learning ensemble 222, based on evaluation metadata from the metadata library 314, or the like. For example, the machine learning compiler module 302 may build one or more synthesized learned functions 324 that are configured to provide one or more features with a greatest contribution as part of a result. In another embodiment, the predictive correlation module 318 may determine one or more features with a greatest contribution to a predicted result or confidence metric dynamically at runtime as the machine learning ensemble 222 determines the predicted result or confidence metric. In such embodiments, the predictive correlation module 318 may be part of, integrated with, or in communication with the machine learning ensemble 222. The predictive correlation module 318 may cooperate with the machine learning ensemble 222, such that the machine learning ensemble 222 provides a listing of one or more features that provided a greatest contribution to a predicted result or confidence metric as part of a response to an analysis request.

[0139] In determining features that are predictive, or that have a greatest contribution to a predicted result or confidence metric, the predictive correlation module 318 may balance a frequency of the contribution of a feature and/or an impact of the

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contribution of the feature. For example, a certain feature or set of features may contribute to the predicted result or confidence metric frequently, for each instance or the like, but have a low impact. Another feature or set of features may contribute relatively infrequently, but has a very high impact on the predicted result or confidence metric (e.g. provides at or near 100% confidence or the like). While the predictive correlation module 318 is described herein as determining features that are predictive or that have a greatest contribution, in other embodiments, the predictive correlation module 318 may determine one or more specific instances of a feature that are predictive, have a greatest contribution to a predicted result or confidence metric, or the like.

[0140] In the depicted embodiment, the machine learning compiler module 302 includes a combiner module 306. The combiner module 306 combines learned functions, forming sets, strings, groups, trees, or clusters of combined learned functions. In certain embodiments, the combiner module 306 combines learned functions into a prescribed order, and different orders of learned functions may have different inputs, produce different results, or the like. The combiner module 306 may combine learned functions in different combinations. For example, the combiner module 306 may combine certain learned functions horizontally or in parallel, joined at the inputs and at the outputs or the like, and may combine certain learned functions vertically or in series, feeding the output of one learned function into the input of another learned function.

[0141] The combiner module 306 may determine which learned functions to combine, how to combine learned functions, or the like based on evaluation metadata for the learned functions from the metadata library 314, generated based on an evaluation of the learned functions using test data, as described below with regard to the function evaluator module 312. The combiner module 306 may request additional learned functions from the function generator module 301, for combining with other learned functions. For example, the combiner module 306 may request a new learned function

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with a particular input and/or output to combine with an existing learned function, or the like.

[0142] While the combining of learned functions may be informed by evaluation metadata for the learned functions, in certain embodiments, the combiner module 306 combines a large number of learned functions pseudo-randomly, forming a large number of combined functions. For example, the combiner module 306, in one embodiment, may determine each possible combination of generated learned functions, as many combinations of generated learned functions as possible given one or more limitations or constraints, a selected subset of combinations of generated learned functions, or the like, for evaluation by the function evaluator module 312. In certain embodiments, by generating a large number of combined learned functions, the combiner module 306 is statistically likely to form one or more combined learned functions that are useful and/or effective for the training data.

[0143] In the depicted embodiment, the machine learning compiler module 302 includes an extender module 308. The extender module 308, in certain embodiments, is configured to add one or more layers to a learned function. For example, the extender module 308 may extend a learned function or combined learned function by adding a probabilistic model layer, such as a Bayesian belief network layer, a Bayes classifier layer, a Boltzman layer, or the like.

[0144] Certain classes of learned functions, such as probabilistic models, may be configured to receive either instances of one or more features as input, or the output results of other learned functions, such as a classification and a confidence metric, an inferred function, a regression function, an answer, a prediction, a recognized pattern, a rule, a recommendation, an evaluation, or the like. The extender module 308 may use these types of learned functions to extend other learned functions. The extender module 308 may extend learned functions generated by the function generator module 301 directly, may extend combined learned functions from the combiner module 306, may

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extend other extended learned functions, may extend synthesized learned functions from the synthesizer module 310, or the like.

[0145] In one embodiment, the extender module 308 determines which learned functions to extend, how to extend learned functions, or the like based on evaluation metadata from the metadata library 314. The extender module 308, in certain embodiments, may request one or more additional learned functions from the function generator module 301 and/or one or more additional combined learned functions from the combiner module 306, for the extender module 308 to extend.

[0146] While the extending of learned functions may be informed by evaluation metadata for the learned functions, in certain embodiments, the extender module 308 generates a large number of extended learned functions pseudo-randomly. For example, the extender module 308, in one embodiment, may extend each possible learned function and/or combination of learned functions, may extend a selected subset of learned functions, may extend as many learned functions as possible given one or more limitations or constraints, or the like, for evaluation by the function evaluator module 312. In certain embodiments, by generating a large number of extended learned functions, the extender module 308 is statistically likely to form one or more extended learned functions and/or combined extended learned functions that are useful and/or effective for the training data.

[0147] In the depicted embodiment, the machine learning compiler module 302 includes a synthesizer module 310. The synthesizer module 310, in certain embodiments, is configured to organize a subset of learned functions into the machine learning ensemble 222, as synthesized learned functions 324. In a further embodiment, the synthesizer module 310 includes evaluation metadata from the metadata library 314 of the function evaluator module 312 in the machine learning ensemble 222 as a synthesized metadata rule set 322, so that the machine learning ensemble 222 includes synthesized

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learned functions 324 and evaluation metadata, the synthesized metadata rule set 322, for the synthesized learned functions 324.

[0148] The learned functions that the synthesizer module 310 synthesizes or organizes into the synthesized learned functions 324 of the machine learning ensemble 222, may include learned functions directly from the function generator module 301, combined learned functions from the combiner module 306, extended learned functions from the extender module 308, combined extended learned functions, or the like. As described below, in one embodiment, the function selector module 316 selects the learned functions for the synthesizer module 310 to include in the machine learning ensemble 222. In certain embodiments, the synthesizer module 310 organizes learned functions by preparing the learned functions and the associated evaluation metadata for processing workload data to reach a result. For example, as described below, the synthesizer module 310 may organize and/or synthesize the synthesized learned functions 324 and the synthesized metadata rule set 322 for the orchestration module 320 to use to direct workload data through the synthesized learned functions 324 to produce a result.

[0149] In one embodiment, the function evaluator module 312 evaluates the synthesized learned functions 324 that the synthesizer module 310 organizes, and the synthesizer module 310 synthesizes and/or organizes the synthesized metadata rule set 322 based on evaluation metadata that the function evaluation module 312 generates during the evaluation of the synthesized learned functions 324, from the metadata library 314 or the like.

[0150] In the depicted embodiment, the machine learning compiler module 302 includes a function evaluator module 312. The function evaluator module 312 is configured to evaluate learned functions using test data, or the like. The function evaluator module 312 may evaluate learned functions generated by the function generator module 301, learned functions combined by the combiner module 306 described above, learned functions extended by the extender module 308 described above, combined

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extended learned functions, synthesized learned functions 324 organized into the machine learning ensemble 222 by the synthesizer module 310 described above, or the like.

[0151] Test data for a learned function, in certain embodiments, comprises a different subset of the initialization data for the learned function than the function generator module 301 used as training data. The function evaluator module 312, in one embodiment, evaluates a learned function by inputting the test data into the learned function to produce a result, such as a classification, a confidence metric, an inferred function, a regression function, an answer, a prediction, a recognized pattern, a rule, a recommendation, an evaluation, or another result.

[0152] Test data, in certain embodiments, comprises a subset of initialization data, with a feature associated with the requested result removed, so that the function evaluator module 312 may compare the result from the learned function to the instances of the removed feature to determine the accuracy and/or effectiveness of the learned function for each test instance. For example, if a client 104 has requested a machine learning ensemble 222 to predict whether a customer will be a repeat customer, and provided historical customer information as initialization data, the function evaluator module 312 may input a test data set comprising one or more features of the initialization data other than whether the customer was a repeat customer into the learned function, and compare the resulting predictions to the initialization data to determine the accuracy and/or effectiveness of the learned function.

[0153] The function evaluator module 312, in one embodiment, is configured to maintain evaluation metadata for an evaluated learned function in the metadata library 314. The evaluation metadata, in certain embodiments, comprises log data generated by the function generator module 301 while generating learned functions, the function evaluator module 312 while evaluating learned functions, or the like.

[0154] In one embodiment, the evaluation metadata includes indicators of one or more training data sets that the function generator module 301 used to generate a learned

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function. The evaluation metadata, in another embodiment, includes indicators of one or more test data sets that the function evaluator module 312 used to evaluate a learned function. In a further embodiment, the evaluation metadata includes indicators of one or more decisions made by and/or branches taken by a learned function during an evaluation by the function evaluator module 312. The evaluation metadata, in another embodiment, includes the results determined by a learned function during an evaluation by the function evaluator module 312. In one embodiment, the evaluation metadata may include evaluation metrics, learning metrics, effectiveness metrics, convergence metrics, or the like for a learned function based on an evaluation of the learned function. An evaluation metric, learning metrics, effectiveness metric, convergence metric, or the like may be based on a comparison of the results from a learned function to actual values from initialization data, and may be represented by a correctness indicator for each evaluated instance, a percentage, a ratio, or the like. Different classes of learned functions, in certain embodiments, may have different types of evaluation metadata.

[0155] The metadata library 314, in one embodiment, provides evaluation metadata for learned functions to the feature selector module 304, the predictive correlation module 318, the combiner module 306, the extender module 308, and/or the synthesizer module 310. The metadata library 314 may provide an API, a shared library, one or more function calls, or the like providing access to evaluation metadata. The metadata library 314, in various embodiments, may store or maintain evaluation metadata in a database format, as one or more flat files, as one or more lookup tables, as a sequential log or log file, or as one or more other data structures. In one embodiment, the metadata library 314 may index evaluation metadata by learned function, by feature, by instance, by training data, by test data, by effectiveness, and/or by another category or attribute and may provide query access to the indexed evaluation metadata. The function evaluator module 312 may update the metadata library 314 in response to each evaluation of a learned function, adding evaluation metadata to the metadata library 314 or the like.

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[0156] The function selector module 316, in certain embodiments, may use evaluation metadata from the metadata library 314 to select learned functions for the combiner module 306 to combine, for the extender module 308 to extend, for the synthesizer module 310 to include in the machine learning ensemble 222, or the like. For example, in one embodiment, the function selector module 316 may select learned functions based on evaluation metrics, learning metrics, effectiveness metrics, convergence metrics, or the like. In another embodiment, the function selector module 316 may select learned functions for the combiner module 306 to combine and/or for the extender module 308 to extend based on features of training data used to generate the learned functions, or the like.

[0157] The machine learning ensemble 222, in certain embodiments, provides machine learning results for an analysis request by processing workload data of the analysis request using a plurality of learned functions (e.g., the synthesized learned functions 324). As described above, results from the machine learning ensemble 222, in various embodiments, may include a classification, a confidence metric, an inferred function, a regression function, an answer, a prediction, a recognized pattern, a rule, a recommendation, an evaluation, and/or another result. For example, in one embodiment, the machine learning ensemble 222 provides a classification and a confidence metric for each instance of workload data input into the machine learning ensemble 222, or the like. Workload data, in certain embodiments, may be substantially similar to test data, but the missing feature from the initialization data is not known, and is to be solved for by the machine learning ensemble 222. A classification, in certain embodiments, comprises a value for a missing feature in an instance of workload data, such as a prediction, an answer, or the like. For example, if the missing feature represents a question, the classification may represent a predicted answer, and the associated confidence metric may be an estimated strength or accuracy of the predicted answer. A classification, in certain embodiments, may comprise a binary value (e.g., yes or no), a rating on a scale

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(e.g., 4 on a scale of 1 to 5), or another data type for a feature. A confidence metric, in certain embodiments, may comprise a percentage, a ratio, a rating on a scale, or another indicator of accuracy, effectiveness, and/or confidence.

[0158] In the depicted embodiment, the machine learning ensemble 222 includes an orchestration module 320. The orchestration module 320, in certain embodiments, is configured to direct workload data through the machine learning ensemble 222 to produce a result, such as a classification, a confidence metric, an inferred function, a regression function, an answer, a prediction, a recognized pattern, a rule, a recommendation, an evaluation, and/or another result. In one embodiment, the orchestration module 320 uses evaluation metadata from the function evaluator module 312 and/or the metadata library 314, such as the synthesized metadata rule set 322, to determine how to direct workload data through the synthesized learned functions 324 of the machine learning ensemble 222. As described below with regard to Figure 8, in certain embodiments, the synthesized metadata rule set 322 comprises a set of rules or conditions from the evaluation metadata of the metadata library 314 that indicate to the orchestration module 320 which features, instances, or the like should be directed to which synthesized learned function 324.

[0159] For example, the evaluation metadata from the metadata library 314 may indicate which learned functions were trained using which features and/or instances, how effective different learned functions were at making predictions based on different features and/or instances, or the like. The synthesizer module 310 may use that evaluation metadata to determine rules for the synthesized metadata rule set 322, indicating which features, which instances, or the like the orchestration module 320 the orchestration module 320 should direct through which learned functions, in which order, or the like. The synthesized metadata rule set 322, in one embodiment, may comprise a decision tree or other data structure comprising rules which the orchestration module 320

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may follow to direct workload data through the synthesized learned functions 324 of the machine learning ensemble 222.

[0160] Figure 4 depicts one embodiment of a system 400 for a machine learning factory. The system 400, in the depicted embodiment, includes several clients 404 in communication with an interface module 402 either locally or over a data network 106. The machine learning module 212 of Figure 4 is substantially similar to the machine learning module 212 of Figure 3, but further includes an interface module 402 and a data repository 406.

[0161] The interface module 402, in certain embodiments, is configured to receive requests from clients 404, to provide results to a client 404, or the like. The machine learning module 212, for example, may act as a client 404, requesting a machine learning ensemble 222 from the interface module 402 or the like. The interface module 402 may provide a machine learning interface to clients 404, such as an API, a shared library, a hardware command interface, or the like, over which clients 404 may make requests and receive results. The interface module 402 may support new ensemble requests from clients 404, allowing clients 404 to request generation of a new machine learning ensemble 222 from the machine learning module 212 or the like. As described above, a new ensemble request may include initialization data; one or more ensemble parameters; a feature, query, question or the like for which a client 404 would like a machine learning ensemble 222 to predict a result; or the like. The interface module 402 may support analysis requests for a result from a machine learning ensemble 222. As described above, an analysis request may include workload data; a feature, query, question or the like; a machine learning ensemble 222; or may include other analysis parameters.

[0162] In certain embodiments, the machine learning module 212 may maintain a library of generated machine learning ensembles 222, from which clients 404 may request results. In such embodiments, the interface module 402 may return a reference,

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pointer, or other identifier of the requested machine learning ensemble 222 to the requesting client 404, which the client 404 may use in analysis requests. In another embodiment, in response to the machine learning module 212 generating a machine learning ensemble 222 to satisfy a new ensemble request, the interface module 402 may return the actual machine learning ensemble 222 to the client 404, for the client 404 to manage, and the client 404 may include the machine learning ensemble 222 in each analysis request.

[0163] The interface module 402 may cooperate with the machine learning module 212 to service new ensemble requests, may cooperate with the machine learning ensemble 222 to provide a result to an analysis request, or the like. The machine learning module 212, in the depicted embodiment, includes the function generator module 301, the feature selector module 304, the predictive correlation module 318, and the machine learning compiler module 302, as described above. The machine learning module 212, in the depicted embodiment, also includes a data repository 406,

[0164] The data repository 406, in one embodiment, stores initialization data, so that the function generator module 301, the feature selector module 304, the predictive correlation module 318, and/or the machine learning compiler module 302 may access the initialization data to generate, combine, extend, evaluate, and/or synthesize learned functions and machine learning ensembles 222. The data repository 406 may provide initialization data indexed by feature, by instance, by training data subset, by test data subset, by new ensemble request, or the like. By maintaining initialization data in a data repository 406, in certain embodiments, the machine learning module 212 ensures that the initialization data is accessible throughout the machine learning ensemble 222 building process, for the function generator module 301 to generate learned functions, for the feature selector module 304 to determine which features should be used in the machine learning ensemble 222, for the predictive correlation module 318 to determine which features correlate with the highest confidence metrics, for the combiner module

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306 to combine learned functions, for the extender module 308 to extend learned functions, for the function evaluator module 312 to evaluate learned functions, for the synthesizer module 310 to synthesize learned functions 324 and/or metadata rule sets 322, or the like.

[0165] In the depicted embodiment, the data receiver module 300 is integrated with the interface module 402, to receive initialization data, including training data and test data, from new ensemble requests. The data receiver module 300 stores initialization data in the data repository 406. The function generator module 301 is in communication with the data repository 406, in one embodiment, so that the function generator module 301 may generate learned functions based on training data sets from the data repository 406. The feature selector module 300 and/or the predictive correlation module 318, in certain embodiments, may cooperate with the function generator module 301 and/or the machine learning compiler module 302 to determine which features to use in the machine learning ensemble 222, which features are most predictive or correlate with the highest confidence metrics, or the like.

[0166] Within the machine learning compiler module 302, the combiner module 306, the extender module 308, and the synthesizer module 310 are each in communication with both the function generator module 301 and the function evaluator module 312. The function generator module 301, as described above, may generate an initial large amount of learned functions, from different classes or the like, which the function evaluator module 312 evaluates using test data sets from the data repository 406. The combiner module 306 may combine different learned functions from the function generator module 301 to form combined learned functions, which the function evaluator module 312 evaluates using test data from the data repository 406. The combiner module 306 may also request additional learned functions from the function generator module 301.

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[0167] The extender module 308, in one embodiment, extends learned functions from the function generator module 301 and/or the combiner module 306. The extender module 308 may also request additional learned functions from the function generator module 301. The function evaluator module 312 evaluates the extended learned functions using test data sets from the data repository 406. The synthesizer module 310 organizes, combines, or otherwise synthesizes learned functions from the function generator module 301, the combiner module 306, and/or the extender module 308 into synthesized learned functions 324 for the machine learning ensemble 222. The function evaluator module 312 evaluates the synthesized learned functions 324, and the synthesizer module 310 organizes or synthesizes the evaluation metadata from the metadata library 314 into a synthesized metadata rule set 322 for the synthesized learned functions 324.

[0168] As described above, as the function evaluator module 312 evaluates learned functions from the function generator module 301, the combiner module 306, the extender module 308, and/or the synthesizer module 310, the function evaluator module 312 generates evaluation metadata for the learned functions and stores the evaluation metadata in the metadata library 314. In the depicted embodiment, in response to an evaluation by the function evaluator module 312, the function selector module 316 selects one or more learned functions based on evaluation metadata from the metadata library 314. For example, the function selector module 316 may select learned functions for the combiner module 306 to combine, for the extender module 308 to extend, for the synthesizer module 310 to synthesize, or the like.

[0169] Figure 5 depicts one embodiment 500 of learned functions 502, 504, 506 for a machine learning ensemble 222. The learned functions 502, 504, 506 are presented by way of example, and in other embodiments, other types and combinations of learned functions may be used, as described above. Further, in other embodiments, the machine learning ensemble 222 may include an orchestration module 320, a synthesized metadata

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rule set 322, or the like. In one embodiment, the function generator module 301 generates the learned functions 502. The learned functions 502, in the depicted embodiment, include various collections of selected learned functions 502 from different classes including a collection of decision trees 502a, configured to receive or process a subset A-F of the feature set of the machine learning ensemble 222, a collection of support vector machines ("SVMs") 502b with certain kernels and with an input space configured with particular subsets of the feature set G-L, and a selected group of regression models 502c, here depicted as a suite of single layer ("SL") neural nets trained on certain feature sets K-N.

[0170] The example combined learned functions 504, combined by the combiner module 306 or the like, include various instances of forests of decision trees 504a configured to receive or process features N-S, a collection of combined trees with support vector machine decision nodes 504b with specific kernels, their parameters and the features used to define the input space of features T-U, as well as combined functions 504c in the form of trees with a regression decision at the root and linear, tree node decisions at the leaves, configured to receive or process features L-R.

[0171] Component class extended learned functions 506, extended by the extender module 308 or the like, include a set of extended functions such as a forest of trees 506a with tree decisions at the roots and various margin classifiers along the branches, which have been extended with a layer of Boltzman type Bayesian probabilistic classifiers. Extended learned function 506b includes a tree with various regression decisions at the roots, a combination of standard tree 504b and regression decision tree 504c and the branches are extended by a Bayes classifier layer trained with a particular training set exclusive of those used to train the nodes.

[0172] Figure 6 depicts one embodiment of a method 600 for a machine learning factory. The method 600 begins, and the data receiver module 300 receives 602 training data. The function generator module 301 generates 604 a plurality of learned functions

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from multiple classes based on the received 602 training data. The machine learning compiler module 302 forms 606 a machine learning ensemble comprising a subset of learned functions from at least two classes, and the method 600 ends.

[0173] Figure 7 depicts another embodiment of a method 700 for a machine learning factory. The method 700 begins, and the interface module 402 monitors 702 requests until the interface module 402 receives 702 an analytics request from a client 404 or the like.

[0174] If the interface module 402 receives 702 a new ensemble request, the data receiver module 300 receives 704 training data for the new ensemble, as initialization data or the like. The function generator module 301 generates 706 a plurality of learned functions based on the received 704 training data, from different machine learning classes. The function evaluator module 312 evaluates 708 the plurality of generated 706 learned functions to generate evaluation metadata. The combiner module 306 combines 710 learned functions based on the metadata from the evaluation 708. The combiner module 306 may request that the function generator module 301 generate 712 additional learned functions for the combiner module 306 to combine.

[0175] The function evaluator module 312 evaluates 714 the combined 710 learned functions and generates additional evaluation metadata. The extender module 308 extends 716 one or more learned functions by adding one or more layers to the one or more learned functions, such as a probabilistic model layer or the like. In certain embodiments, the extender module 308 extends 716 combined 710 learned functions based on the evaluation 712 of the combined learned functions. The extender module 308 may request that the function generator module 301 generate 718 additional learned functions for the extender module 308 to extend. The function evaluator module 312 evaluates 720 the extended 716 learned functions. The function selector module 316 selects 722 at least two learned functions, such as the generated 706 learned functions,

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the combined 710 learned functions, the extended 716 learned functions, or the like, based on evaluation metadata from one or more of the evaluations 708, 714, 720.

[0176] The synthesizer module 310 synthesizes 724 the selected 722 learned functions into synthesized learned functions 324. The function evaluator module 312 evaluates 726 the synthesized learned functions 324 to generate a synthesized metadata rule set 322. The synthesizer module 310 organizes 728 the synthesized 724 learned functions 324 and the synthesized metadata rule set 322 into a machine learning ensemble 222. The interface module 402 provides 730 a result to the requesting client 404, such as the machine learning ensemble 222, a reference to the machine learning ensemble 222, an acknowledgment, or the like, and the interface module 402 continues to monitor 702 requests.

[0177] If the interface module 402 receives 702 an analysis request, the data receiver module 300 receives 732 workload data associated with the analysis request. The orchestration module 320 directs 734 the workload data through a machine learning ensemble 222 associated with the received 702 analysis request to produce a result, such as a classification, a confidence metric, an inferred function, a regression function, an answer, a recognized pattern, a recommendation, an evaluation, and/or another result. The interface module 402 provides 730 the produced result to the requesting client 404, and the interface module 402 continues to monitor 702 requests.

[0178] Figure 8 depicts one embodiment of a method 800 for directing data through a machine learning ensemble. The specific synthesized metadata rule set 322 of the depicted method 800 is presented by way of example only, and many other rules and rule sets may be used.

[0179] A new instance of workload data is presented 802 to the machine learning ensemble 222 through the interface module 402. The data is processed through the data receiver module 300 and configured for the particular analysis request as initiated by a client 404. In this embodiment the orchestration module 320 evaluates a certain set of

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features associates with the data instance against a set of thresholds contained within the synthesized metadata rule set 322.

[0180] A binary decision 804 passes the instance to, in one case, a certain combined and extended function 806 configured for features A-F or in the other case a different, parallel combined function 808 configured to predict against a feature set G-M. In the first case 806, if the output confidence passes 810 a certain threshold as given by the meta-data rule set the instance is passed to a synthesized, extended regression function 814 for final evaluation, else the instance is passed to a combined collection 816 whose output is a weighted voted based processing a certain set of features. In the second case 808 a different combined function 812 with a simple vote output results in the instance being evaluated by a set of base learned functions extended by a Boltzman type extension 818 or, if a prescribed threshold is meet the output of the synthesized function is the simple vote. The interface module 402 provides 820 the result of the orchestration module directing workload data through the machine learning ensemble 222 to a requesting client 404 and the method 800 continues.

[0181] Figure 9 depicts one embodiment of a method 900 for machine learning results. The method 900 begins and an input module 202 receives 902 user input identifying a value for a machine learning parameter. A display module 204 displays 904 one or more machine learning results for the identified 902 machine learning parameter in response to the input module 202 receiving 902 the user input. The one or more machine learning results may be determined by a machine learning module 212 using machine learning, cached by a pre-compute module 208 in a results data structure, and retrieved using the identified 902 machine learning parameter, or the like. An update module 206 dynamically updates 906 the displayed 904 one or more machine learning results in response to the input module 202 receiving additional user input identifying an additional value for the machine learning parameter and the method 900 ends.

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[0182] Figure 10 depicts one embodiment of a method 1000 for machine learning results. The method 1000 begins and a pre-compute module 208 inputs 1002 permutations of machine learning parameters incrementally between minimum values for the machine learning parameters and maximum values for the machine learning parameters into a predictive program 222. A machine learning module 212 determines 1004 machine learning results from the predictive program 222 for the input 1002 permutations of the machine learning parameters. The pre-compute module 208 populates 1006 a results data structure with the determined 1004 machine learning results indexed by the machine learning parameters and the method 1000 ends.

[0183] Figure 11 depicts one embodiment of a method 1100 for machine learning results. The method 1100 begins and a pre-compute module 208 inputs 1102 permutations of machine learning parameters incrementally between minimum values for the machine learning parameters and maximum values for the machine learning parameters into a predictive program 222. A machine learning module 212 determines 1104 machine learning results from the predictive program 222 for the input 1102 permutations of the machine learning parameters. The pre-compute module 208 populates 1106 a results data structure with the determined 1104 machine learning results indexed by the machine learning parameters.

[0184] An input module 202 receives 1108 user input identifying a value for a machine learning parameter. A display module 204 displays 1110 one or more machine learning results for the identified 1108 machine learning parameter in response to the input module 202 receiving 1108 the user input. The one or more machine learning results may be determined by a machine learning module 212 using machine learning, cached by a pre-compute module 208 in a results data structure, and retrieved using the identified 1108 machine learning parameter, or the like. An update module 206 dynamically updates 1112 the displayed 1110 one or more machine learning results in

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response to the input module 202 receiving additional user input identifying an additional value for the machine learning parameter and the method 1100 ends.

[0185] The present disclosure may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the disclosure is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

[0186] What is claimed is:

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1. An apparatus for machine learning results, the apparatus comprising:

an input module configured to receive user input identifying one or more values for one or more machine learning parameters;

a display module configured to display one or more machine learning results for the one or more identified machine learning parameters, the one or more machine learning results determined using machine learning; and

an update module configured to dynamically update the displayed one or more machine learning results in response to the input module receiving additional user input identifying one or more additional values for the one or more machine learning parameters.

2. The apparatus of claim 1, further comprising a pre-compute module configured to predetermine, using the machine learning, permutations of the machine learning results at predefined increments between a minimum value for the one or more machine learning parameters and a maximum value for the one or more machine learning parameters, prior to the input module receiving the user input.

3. The apparatus of claim 2, wherein the pre-compute module is configured to cache the predetermined permutations of the machine learning results for the update module in a results data structure indexed by the one or more machine learning parameters.

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4. The apparatus of claim 3, wherein the pre-compute module is configured to determine the machine learning results by looking up the machine learning results in the results data structure using the one or more machine learning parameters.

5. The apparatus of claim 1, wherein the display module is configured to display one or more attributes of a data set used by the machine learning to determine the one or more machine learning results and one or more impact metrics for each displayed attribute.

6. The apparatus of claim 1, further comprising a predictive compiler module configured to generate the machine learning, the machine learning comprising program code for a plurality of learned functions from multiple machine learning classes, the program code generated by the predictive compiler module to predict the machine learning results based on the one or more machine learning parameters.

7. The apparatus of claim 1, further comprising a recommendation module configured to select a suggested set of machine learning results, the display module configured to display the suggested set of machine learning results to the user prior to the input module receiving the user input.

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8. The apparatus of claim 1, wherein the one or more machine learning parameters comprise one or more of an input and an output of the machine learning adjusted by the user input and the machine learning results comprise one or more of an input and an output of the machine learning determined based on the adjusted one or more machine learning parameters.

9. The apparatus of claim 1, wherein the one or more machine learning parameters comprise one or more of an attribute of a feature, a target value for a goal, an action relating to a goal, a confidence metric, and a target of an action.

10. The apparatus of claim 1, wherein the machine learning results comprise one or more of an attribute of a feature, a target value for a goal, an action relating to a goal, a confidence metric, and a target of an action.

11. The apparatus of claim 1, wherein the input module is configured to receive the user input as an adjustment to a slider graphical user interface element corresponding to the one or more machine learning parameters.

12. The apparatus of claim 1, wherein the input module is configured to receive the user input as a user entry in a graphical table and the display module is configured to display the one or more machine learning results as entries in the graphical table.

13. The apparatus of claim 1, wherein the input module is configured to receive the user input as a user manipulation of a displayed object.

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14. The apparatus of claim 13, wherein the user input comprises one or more of:

an adjustment to a size of the displayed object;

an adjustment to a vertical position of the displayed object;

an adjustment to a horizontal position of the displayed object;

an adjustment to an opacity of the displayed object;

an adjustment to a color of the displayed object;

an adjustment to a shape of the displayed object;

an adjustment to shading of the displayed object;

a text entry in a text box for the displayed object; and

user interaction with an animation for the displayed object.

15. The apparatus of claim 1, further comprising a collaboration module configured to determine an impact on the one or more machine learning results based on different user input received from a different user.

16. The apparatus of claim 15, wherein the input module is configured to receive the different user input from the different user, the different user input identifying a different value for a different machine learning parameter, the display module configured to display multiple sets of one or more machine learning results to multiple users, and the update module configured to dynamically update the displayed multiple sets of one or more machine learning results.

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17. A method for machine learning results, the method comprising:

inputting permutations of machine learning parameters incrementally between minimum values for the machine learning parameters and maximum values for the machine learning parameters into a predictive program;

determining machine learning results from the predictive program for the input permutations of the machine learning parameters; and

populating a results data structure with the determined machine learning results indexed by the machine learning parameters.

18. The method of claim 17, wherein the results data structure is populated prior to receiving user input identifying a value for a machine learning parameter.

19. The method of claim 17, further comprising dynamically displaying one or more corresponding machine learning parameters and machine learning results from the results data structure in response to user input selecting a value for one or more of a machine learning parameter and a machine learning result.

20. The method of claim 19, further comprising dynamically changing the displayed one or more corresponding machine learning parameters and machine learning results using the results data structure in response to user input adjusting a value for a machine learning parameter.

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21. The method of claim 19, further comprising dynamically changing the displayed one or more corresponding machine learning parameters and machine learning results using the results data structure in response to user input adjusting a value for a machine learning result.

22. A system for machine learning results, the system comprising:

a pre-compute module configured to predetermine, using one or more predictive programs, permutations of machine learning results for each of the one or more predictive programs at predefined increments between minimum values for machine learning parameters and maximum values for the machine learning parameters;

an input module configured to receive user input from multiple users identifying values for one or more of the machine learning parameters for the one or more predictive programs; and

a display module configured to display one or more of the predetermined machine learning results to the multiple users based on the identified values.

23. The system of claim 22, further comprising a collaboration module configured to determine an impact on machine learning results from one of the predictive programs based on an identified value for a machine learning parameter for another of the predictive programs.

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24. The system of claim 23, wherein the multiple users identify the values for different predictive programs of the predictive programs.

25. The system of claim 24, wherein the display module is configured to display the impact on the machine learning results on a shared display for the multiple users and to display the machine learning results for the different predictive programs on different displays for the multiple users.

26. The system of claim 22, wherein the input module is configured to receive the user input from one or more of:

separate client devices for the multiple users over a data network; and

a shared interface for the multiple users on a single device.

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ABSTRACT OF THE DISCLOSURE

Apparatuses, systems, methods, and computer program products are disclosed for machine learning results. An input module may receive user input identifying a value for a machine learning parameter. A display module may display one or more machine learning results for the identified machine learning parameter in response to the input module receiving the user input. An update module may dynamically update the displayed one or more machine learning results in response to the input module receiving additional user input identifying an additional value for the machine learning parameter. A pre-compute module may predetermine permutations of the machine learning results prior to the input module receiving the user input.

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Electronic Patent Application Fee Transmittal	
Application Number:	
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Title of Invention:	USER INTERFACE FOR MACHINE LEARNING
First Named Inventor/Applicant Name:	Kelly D. Phillipps
Filer:	Scott C. Hilton/Vicki Crist
Attorney Docket Number:	3128.2.5
Filed as Small Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Claims in excess of 20	2202	6	40	240
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**970**

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Information:					
2	Oath or Declaration filed	3128_2_5_Dec_Assign.pdf	2601084 bd14ed19d44aeae819c1416324b339905e39b327	no	2
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7	Information Disclosure Statement (IDS) Form (SB08)	3128_2_5_IDS.pdf	612682 46b8dcd6488ca8d7bf3a2aea5ea044f07f5d000f	no	4
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8	Drawings-only black and white line drawings	3128_2_5_Figs.pdf	246745 71fa0a1e0053aae820887926437a130f732fe763	no	14
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9		3128_2_5_App.pdf	345201 ac7afb62f273f8c87c55b4e48142620be212fe12	yes	74

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	Document Description	**Start**	**End**
	Specification	1	66
	Claims	67	73
	Abstract	74	74

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