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PATENT
Docket No. 3128.2.5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Kelly D. Phillipps, et al.

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For: USER INTERFACE FOR MACHINE LEARNING

Examiner: Daywayshwar D. Misir

Group Art
Unit: 2129

AMENDMENT AND RESPONSE TO OFFICE ACTION

Mailstop: Amendments
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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,

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