

CORRECTED

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	<u>15/010,345</u>
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

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 I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in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	26486		

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	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Present	non provisional of	62109183	2015-01-29
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			

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.			

Petitioner Ex-1004, 0373

CORRECTED

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	<u>15/010,345</u>
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

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.
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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.	

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.
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	<u>15/010,345</u>
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

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 WORCESTER POLYTECHNIC INSTITUTE

Mailing Address Information For Applicant:

Address 1	<u>100 INSTITUTE ROAD</u>		
Address 2			
City	<u>WORCESTER</u>	State/Province	<u>MA</u>
Country	<u>US</u>	Postal Code	<u>01609</u>
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 substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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).

If the Assignee is an Organization check here. ☒

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
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Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

Organization Name	<u>WORCESTER POLYTECHNIC INSTITUTE</u>
-------------------	--

Mailing Address Information For Non-Applicant Assignee:			
Address 1		<u>100 INSTITUTE ROAD</u>	
Address 2			
City	<u>WORCESTER</u>	State/Province	<u>MA</u>
Country ⁱ	<u>US</u>	Postal Code	<u>01609</u>
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button.

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	/Orlando Lopez/			Date (YYYY-MM-DD)	<u>2019-05-08</u> ~~2016-04-20~~
First Name	Orlando	Last Name	Lopez	Registration Number	46880
Additional Signature may be generated within this form by selecting the Add button.					

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.

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.

STATEMENT UNDER 37 CFR 3.73(c)Applicant/Patent Owner: WORCESTER POLYTECHNIC INSTITUTEApplication No./Patent No.: 15/010,345 Filed/Issue Date: 01-29-2016Titled: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALSWORCESTER POLYTECHNIC INSTITUTE, a corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose one of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose one of options A or B below):

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 048982, Frame 0544, or for which a copy thereof is attached.
- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:
1. From: _____ To: _____
- The document was recorded in the United States Patent and Trademark Office at
- Reel _____, Frame _____, or for which a copy thereof is attached.
2. From: _____ To: _____
- The document was recorded in the United States Patent and Trademark Office at
- Reel _____, Frame _____, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). 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 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.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
 Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Orlando Lopez/

Signature

Orlando Lopez

Printed or Typed Name

May 7, 2019

Date

46880

Title or Registration 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.



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 NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/010,345	01/29/2016	Ki H. Chon	30210-216

26486
BURNS & LEVINSON, LLP
125 SUMMER STREET
BOSTON, MA 02110

CONFIRMATION NO. 2095
POA ACCEPTANCE LETTER



Date Mailed: 05/13/2019

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/08/2019.

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.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/dtdinh/



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/010,345	01/29/2016	3791	1440	30210-216	36	3

26486
BURNS & LEVINSON, LLP
125 SUMMER STREET
BOSTON, MA 02110

CONFIRMATION NO. 2095
CORRECTED FILING RECEIPT



Date Mailed: 05/13/2019

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

Ki H. Chon, Worcester, MA;
Jowoon Chong, Worcester, MA;
Duy Dao, Malden, MA;
Hamed Salehizadeh, Worcester, MA;

Applicant(s)

WORCESTER POLYTECHNIC INSTITUTE, WORCESTER, MA;

Assignment For Published Patent Application

WORCESTER POLYTECHNIC INSTITUTE, WORCESTER, MA

Power of Attorney: The patent practitioners associated with Customer Number 26486

Domestic Priority data as claimed by applicant

This appln claims benefit of 62/109,183 01/29/2015

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 Application via Priority Document Exchange: No

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 02/24/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/010,345**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR
PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

Preliminary Class

600

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

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

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).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

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)

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.

26486 7590 02/14/2019
BURNS & LEVINSON, LLP
125 SUMMER STREET
BOSTON, MA 02110

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/010,345	01/29/2016	Ki H. Chon	30210-216	2095

TITLE OF INVENTION: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$0.00	\$500	05/14/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
SHOSTAK, ANDREY	3791	600-500000

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 03-09 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 Burns & Levinson LLP
2 Orlando Lopez
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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

WORCESTER POLYTECHNIC INSTITUTE Worcester, Massachusetts

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

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 03-2410

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
☐ Applicant asserting small entity status. See 37 CFR 1.27
☐ Applicant changing to regular undiscounted fee status.

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.
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.
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 /Orlando Lopez/

Date May 13, 2019

Typed or printed name Orlando Lopez

Registration No. 46,880

Electronic Patent Application Fee Transmittal

Application Number:	15010345			
Filing Date:	29-Jan-2016			
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS			
First Named Inventor/Applicant Name:	Ki H. Chon			
Filer:	Orlando Lopez			
Attorney Docket Number:	30210-216			
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	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				500

Electronic Acknowledgement Receipt

EFS ID:	35992368
Application Number:	15010345
International Application Number:	
Confirmation Number:	2095
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS
First Named Inventor/Applicant Name:	Ki H. Chon
Customer Number:	26486
Filer:	Orlando Lopez
Filer Authorized By:	
Attorney Docket Number:	30210-216
Receipt Date:	13-MAY-2019
Filing Date:	29-JAN-2016
Time Stamp:	14:22:28
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$500
RAM confirmation Number	051419INTEFSW14225500
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

--

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	30210-216_IssueFee.pdf	93624	no	1
			139046bd2332bb7022d7d34af9250e7135dc1ea2		

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30246	no	2
			64b0b4115c7dd1b826ab749c57886320e586caee		

Warnings:

Information:

Total Files Size (in bytes):			123870
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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.



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.
15/010,345	01/29/2016	Ki H. Chon	30210-216	2095

EXAMINER	
SHOSTAK, ANDREY	

ART UNIT	PAPER NUMBER
3791	

NOTIFICATION DATE	DELIVERY MODE
05/20/2019	ELECTRONIC

7590 05/20/2019
BURNS & LEVINSON, LLP
125 SUMMER STREET
BOSTON, MA 02110

Notice of Abandonment

This application is abandoned in view of:

1. ☐ The applicant's failure to timely file a proper reply to the Office letter mailed on _____.
 - (a) ☐ A reply was received on _____ (with a Certificate of Mailing or Transmission date _____), which is after the expiration of the period for reply (including a total extension of _____ month(s)) which expired on _____.
 - (b) ☐ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
 - (a) ☐ The issue fee and publication fee, if applicable, was received on _____ (with a Certificate of Mailing or Transmission date _____), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
 - (b) ☐ The submitted fee of \$_____ is insufficient. A balance of \$_____ is due.
The issue fee required by 37 CFR 1.18 is \$_____.
The publication fee, if required by 37 CFR 1.18(d), is \$_____.
 - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
 - (a) ☐ Proposed corrected drawings were received on _____ (with a Certificate of Mailing or Transmission dated _____), which is after the expiration of the period for reply.
 - (b) ☐ No corrected drawing have been received.
4. ☒ Applicant's failure to timely file the inventor's oath or declaration no later than the date on which the issue fee was paid as required by the Notice Requiring Inventor's Oath or Declaration (PTO-2306).
 - (a) ☐ An inventor's oath or declaration was received on _____ (with a Certificate of Mailing or Transmission date _____), which is after the date on which the issue fee was paid.
 - (b) ☒ While an oath or declaration (or substitute statement) for one or more inventors was received, an oath or declaration (or substitute statement) for at least one other inventor has not been received.
 - (c) ☐ No inventor's oath or declaration has been received.
5. ☐ Drawings received on _____ were disapproved by examiner. See examiner's response dated _____.
6. ☐ Corrected drawings were received on _____, which is after the expiration of the one-month period for reply set in examiner's response dated _____.
7. ☐ No corrected drawings have been received in reply to one-month period set in examiner's response dated _____.
8. ☒ The reason(s) below: Needs oath for Jowoon Chong.

Petitions to revive under 37 CFR 1.137(a) or request to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

(571)-272-4200 or 1(888)-786-0101

Patent Publication Branch
Office of Data Management

FORM PTO-ABN0 (Rev. 03/17)

Petitioner Ex-1004, 0391

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 05/21/2019

CVORACHA	SALE	#00000037	Mailroom Dt:	05/20/2019	032410	15010345
		01 FC : 2830		70.00 DA		

**PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT
ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(a)**

Docket Number (Optional)

30210-216

Page 1 of 2

First named inventor: Ki H. ChonApplication No.: 15/010,345Art Unit: 3791Filed: January 29, 2016Examiner: Andrey ShostakTitle: **MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION
ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS**

Attention: Office of Petitions

Mail Stop Petition

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

FAX (571) 273-8300

NOTE: If information or assistance is needed in completing this form, please contact the Office of Petitions at (571) 272-3282.

The above-identified application became abandoned for failure to file a timely and proper reply to a notice or action by the United States Patent and Trademark Office. The date of abandonment is the day after the expiration date of the period set for reply in the Office notice or action plus any extensions of time actually obtained.

APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION.

NOTE: A grantable petition requires the following items:

- (1) Petition fee;
- (2) Reply and/or issue fee;
- (3) Terminal disclaimer with disclaimer fee – required for all utility and plant applications filed before June 8, 1995, and for all design applications; and
- (4) Statement that the entire delay was unintentional.

1. Petition fee
☒ Small entity fee \$ 1,000 (37 CFR 1.17(m)). Applicant asserts small entity status. See 37 CFR 1.27.

☐ Micro entity fee \$ _____ (37 CFR 1.17(m)). Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/18A or B or equivalent must either be enclosed or have been submitted previously.

☐ Undiscounted fee \$ _____ (37 CFR 1.17(m)).
2. Reply and/or fee

A The reply and/or fee to the above-noted Office notice or action in the form of

Request for Corrected Filing Receipt (Identify the type of reply):

☐ has been filed previously on _____

☒ is enclosed herewith.
B The issue fee and publication fee (if applicable) of \$ 500
☒ has been paid previously on May 13, 2019
☐ is enclosed herewith.

This collection of information is required by 37 CFR 1.137(b). 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, 1.14 and 41.6. 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: Mail Stop Petition, 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.

PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(a)

Page 2 of 2

3. Terminal disclaimer with disclaimer fee

- ☒ Since this utility/plant application was filed on or after June 8, 1995, no terminal disclaimer is required.
- ☐ A terminal disclaimer (and disclaimer fee (37 CFR 1.20(d)) of \$ _____) disclaiming the required period of time is enclosed herewith (see PTO/SB/68).

4. STATEMENT: The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(a) was unintentional. [NOTE: The United States Patent and Trademark Office may require additional information if there is a question as to whether either the abandonment or the delay in filing a petition under 37 CFR 1.137(a) was unintentional (MPEP 711.03(c), subsections (III)(C) and (D)).]

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

/Orlando Lopez/

Signature

May 20, 2019

Date

Orlando Lopez

Typed or Printed Name

46,880

Registration Number, if applicable

Burns & Levinson, LLP, 125 Summer Street

Address

(617) 345-3000

Telephone Number

Boston, MA 02210

Address

Enclosures:

- ☒ Fee Payment
- ☒ Reply
- ☐ Terminal Disclaimer Form
- ☐ Additional sheet(s) containing statements establishing unintentional delay
- ☒ Other: Corrected ADS

CERTIFICATE OF MAILING OR TRANSMISSION (37 CFR 1.8(a))

I hereby certify that this correspondence is being:

- ☐ Deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Petition, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.
- ☐ Transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (571) 273-8300.

Date

Signature

Typed or printed name of person signing certificate

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Worcester Polytechnic Institute Examiner: Andrey Shostak
Application Number: 15/010,345 Group Art Unit: 3791
Filed: January 20, 2016 Confirm. No. 2095
For: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION
ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

BURNS & LEVINSON, LLP
125 Summer Street
Boston, MA 02110
(617) 345-3000

TO: Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**REQUEST FOR CORRECTED FILING RECEIPT
AND SUBMISSION OF CORRECTED ADS**

Sir:

In response to the Notice of Abandonment mailed on May 20, 2019 in the above-referenced patent application, Applicant hereby requests a Corrected Filing Receipt.

Specifically, Applicant requests a correction of the second-named inventor in the application from "Jowoon Chong" to -- Jo Woon Chong --, as identified in the Substitute Statement in Lieu of an Oath or Declaration filed by Applicant on May 8, 2019. A corrected ADS is also filed herewith. Accordingly, Applicant submits that the inventors' oaths or declarations were timely filed by the payment of the issue fee on May 13, 2019.

The Director of Patents and Trademarks is authorized to charge the small entity petition fee under 35 C.F.R. 1.17(m), and any fee deficiencies, or to credit overpayments, to Deposit Account No. 03-2410, Order No. 30210-216.

Respectfully submitted,

Date: May 20, 2019

By: /Marlo Schepper Grolnic/
Marlo Schepper Grolnic
Reg. No. 57,194
Agent for Applicant

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		
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		
	KI	H.	Chon			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Worcester	State/Province	MA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1		c/o Worcester Polytechnic Institute				
Address 2		100 Institute Road				
City	Worcester	State/Province	MA			
Postal Code	01609	Country	US			
Inventor 2					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Jowoon Jo Woon		Chong			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Worcester	State/Province	MA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1		c/o Worcester Polytechnic Institute				
Address 2		100 Institute Road				
City	Worcester	State/Province	MA			
Postal Code	01609	Country	US			
Inventor 3					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Duy		Dao			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

City	Malden	State/Province	MA	Country of Residence	US
-------------	--------	-----------------------	----	-----------------------------	----

Mailing Address of Inventor:

Address 1	c/o Worcester Polytechnic Institute				
Address 2	100 Institute Road				
City	Worcester	State/Province	MA		
Postal Code	01609	Country	US		

Inventor	4	Remove		
Legal Name				
Prefix	Given Name	Middle Name	Family Name	Suffix
	Hamed		Salehizadeh	

Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service

City	Worcester	State/Province	MA	Country of Residence	US
-------------	-----------	-----------------------	----	-----------------------------	----

Mailing Address of Inventor:

Address 1	c/o Worcester Polytechnic Institute				
Address 2	100 Institute Road				
City	Worcester	State/Province	MA		
Postal Code	01609	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).

☐ An Address is being provided for the correspondence information of this application.			
Customer Number	26486		
Email Address	docketing@turnslev.com	Add Email	Remove Email

Application Information:

Title of the Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		
Attorney Docket Number	30210-216	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	Suggested Figure for Publication (if any)	

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

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	26486		

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	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Present	non provisional of	62109183	2015-01-29
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			

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) ¹ 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 ¹	Filing Date (YYYY-MM-DD)	Access Code ¹ (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

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.

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

Applicant 1			
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.46), 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	
☐ 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	WORCESTER POLYTECHNIC INSTITUTE		
Mailing Address Information For Applicant:			
Address 1	100 INSTITUTE ROAD		
Address 2			
City	WORCESTER	State/Province	MA
Country	US	Postal Code	01609
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 substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.	
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).	
If the Assignee is an Organization check here. ☒	

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number 30210-216	
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		
Organization Name	WORCESTER POLYTECHNIC INSTITUTE		
Mailing Address Information For Non-Applicant Assignee:			
Address 1	100 INSTITUTE ROAD		
Address 2			
City	WORCESTER	State/Province	MA
Country	US	Postal Code	01609
Phone Number		Fax Number	
Email Address			
Additional Assignee Data may be generated within this form by selecting the Add button.			

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	/Orlando Lopez/		Date (YYYY-MM-DD) 2016-01-29
First Name	Orlando	Last Name	Lopez
		Registration Number	46880
Additional Signature may be generated within this form by selecting the Add button.			

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.

Electronic Patent Application Fee Transmittal

Application Number:	15010345			
Filing Date:	29-Jan-2016			
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS			
First Named Inventor/Applicant Name:	Ki H. Chon			
Filer:	Marlo Schepper Grolnic			
Attorney Docket Number:	30210-216			
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:				
PET. REVIVE ABANDON APP, DELAY PYMT-RESP	2453	1	1000	1000
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1000

Electronic Acknowledgement Receipt

EFS ID:	36060328
Application Number:	15010345
International Application Number:	
Confirmation Number:	2095
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS
First Named Inventor/Applicant Name:	Ki H. Chon
Customer Number:	26486
Filer:	Marlo Schepper Grolnic
Filer Authorized By:	
Attorney Docket Number:	30210-216
Receipt Date:	20-MAY-2019
Filing Date:	29-JAN-2016
Time Stamp:	15:50:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 1000
RAM confirmation Number	052119INTEFSW15515400
Deposit Account	032410
Authorized User	Marlo Grolnic

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.17 (Patent application and reexamination processing fees)

Petitioner Ex-1004, 0404

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		216PetitionRevive.pdf	675821	yes	9
			5f899701a0e28bcf8d3b60eebc17cb3745dae17e		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Petition for review by the Office of Petitions		1	2	
	Request for Corrected Filing Receipt		3	3	
	Application Data Sheet		4	9	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30435	no	2
			0343c41393d8bb6e060e5af23ed6bd77544fcdc10		
Warnings:					
Information:					
Total Files Size (in bytes):			706256		

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.



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 NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/010,345	01/29/2016	3791	1440	30210-216	36	3

26486
BURNS & LEVINSON, LLP
125 SUMMER STREET
BOSTON, MA 02110

CONFIRMATION NO. 2095
UPDATED FILING RECEIPT



Date Mailed: 05/23/2019

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

Ki H. Chon, Worcester, MA;
Jo Woon Chong, Worcester, MA;
Duy Dao, Malden, MA;
Hamed Salehizadeh, Worcester, MA;

Applicant(s)

WORCESTER POLYTECHNIC INSTITUTE, WORCESTER, MA;

Assignment For Published Patent Application

WORCESTER POLYTECHNIC INSTITUTE, WORCESTER, MA

Power of Attorney: The patent practitioners associated with Customer Number 26486

Domestic Priority data as claimed by applicant

This appln claims benefit of 62/109,183 01/29/2015

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 Application via Priority Document Exchange: No

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR
PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

Preliminary Class

600

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

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

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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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



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 NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/010,345	01/29/2016	Ki H. Chon	30210-216

26486
BURNS & LEVINSON, LLP
125 SUMMER STREET
BOSTON, MA 02110

CONFIRMATION NO. 2095
37 CFR 1.48(f)
ACKNOWLEDGEMENT LETTER



OC000000108364615

Date Mailed: 05/23/2019

NOTICE OF ACCEPTANCE OF REQUEST UNDER 37 CFR 1.48(f)

This is in response to the applicant's request under 37 CFR 1.48(f) submitted on 05/20/2019.

The request under 37 CFR 1.48(f) to correct the inventorship, to correct or update the name of an inventor, or to correct the order of names of joint inventors is accepted.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/ttran/



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.
15/010,345	01/29/2016	Ki H. Chon	30210-216	2095
26486	7590	10/24/2019	EXAMINER	
BURNS & LEVINSON, LLP			SHOSTAK, ANDREY	
125 HIGH STREET				
BOSTON, MA 02110				
			ART UNIT	PAPER NUMBER
			3791	
			NOTIFICATION DATE	DELIVERY MODE
			10/24/2019	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):

docketing@burnslev.com



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Application of :
Chon et al. :
Application No. 15/010,345 :
Filed: 29 Jan 2016 : **DECISION ON PETITION**
For: MOTION AND NOISE ARTIFACT :
DETECTION AND RECONSTRUCTION :
ALGORITHMS FOR PHOTOPLETHYSMOGRAM :
AND EQUIVALENT SIGNALS :

This is a decision on the petition pursuant to 37 CFR 1.137(a), filed May 20, 2019, to revive the above-identified application.

The petition is **DISMISSED**.

Any request for reconsideration of this decision must be submitted within TWO (2) MONTHS from the mail date of this decision. Extensions of time under 37 CFR 1.136(a) are permitted. The reconsideration request should include a cover letter entitled "Renewed Petition under 37 CFR 1.137(a)." This is **not** a final agency action within the meaning of 5 U.S.C. § 704. No further petition fee is required.

The application became abandoned for failure to timely file the inventor's oath or declaration no later than the date on which the issue fee was paid. No inventor's oath or declaration having been received, the application became abandoned by operation of law on May 14, 2019. The Office mailed a Notice of Abandonment on May 20, 2019.

A grantable petition under 37 CFR 1.137(a) must be accompanied by: (1) the required reply, unless previously filed; (2) the petition fee as set forth in 37 CFR 1.17(m); and (3) a statement that the entire delay in filing the required reply from the due date for the reply until the filing of a grantable petition pursuant to 37 CFR 1.137(a) was unintentional. Where there is a question as to whether either the abandonment or the delay in filing a petition under 37 CFR 1.137 was unintentional, the Director may require additional information. See MPEP 711.03(c)(II)(C) and (D).

The petition does not comply with requirement (1). A review of the record indicates the request under 37 CFR 1.48 has been entered before the rendering of a decision on the petition under 37 CFR 1.137(a). While a corrected filing receipt and the Notice of Acceptance of Request under 37 CFR 1.48(a) were mailed on May 23, 2019, it was mailed prematurely. The request under 1.48 included an updated application data sheet (ADS). When an ADS is provided in a patent application, the ADS becomes part of the application.

37 CFR 1.312 states, no amendment may be made as a matter of right in an application after the mailing of the notice of allowance. Any amendment filed pursuant to this section must be filed before or with the payment of the issue fee, and may be entered on the recommendation of the primary examiner, approved by the Director, without withdrawing the application from issue.

Since 37 CFR 1.312 prohibits amendments to the disclosure after the payment of an issue fee, in order for the amendments to be accepted as part of the required reply, a renewed petition under 37 CFR 1.137(a) must include a petition to withdraw this application from issue under the provisions of 37 CFR 1.313(c)(2), a Request for Continued Examination and a submission under 37 CFR 1.114 (which would be the correction of inventorship under 37 CFR 1.48), and the required fees.

The address on the petition is different than the address of record. A courtesy copy of this decision will be mailed to the petitioner. However, all future correspondence will be directed to the address of record until such time as appropriate instructions are received to the contrary.

Further correspondence with respect to this matter should be delivered through one of the following mediums:

By mail: Mail Stop PETITIONS
Commissioner for Patents
Post Office Box 1450
Alexandria, VA 22313-1450

By hand: Customer Service Window
Mail Stop Petitions
Randolph Building
401 Dulany Street
Alexandria, VA 22314

By fax: (571) 273-8300
ATTN: Office of Petitions

By internet: EFS-Web¹

Any questions concerning this decision may be directed to Paula Britton at 571-272-1556.

/Irvin Dingle/
Irvin Dingle
Lead Paralegal Specialist
Office of Petitions

Cc: Orlando Lopez
Burns & Levinson, LLP
125 Summer Street
Boston, MA 02210

¹ www.uspto.gov/ebs/efs_help.html (for help using EFS-Web call the Patent Electronic Business Center at (866) 217-9197).

Transmittal Communication on Petition	Application/Control No. 15/010,345	Applicant(s)/Patent Under Reexamination Chon et al.	
	Deciding Official SHOSTAK, ANDREY	Office of Petitions OPET	

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

(ADDITIONAL PARTY'S CORRESPONDENCE ADDRESS)

Orlando Lopez
Burns & Levinson, LLP
125 Summer Street
Boston, MA 02210

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above-identified Application/Patent.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Worcester Polytechnic Institute Examiner: Andrey Shostak
Application Number: 15/010,345 Group Art Unit: 3791
Filed: January 20, 2016 Confirm. No. 2095
For: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION
ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

Burns & Levinson LLP
125 High Street
Boston, MA 02110
(617) 345-3000

To: Office of Petitions
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RENEWED PETITION UNDER 37 C.F.R. 1.137(a)

Sir:

In response to the Decision on Petition under 37 CFR 1.137(a) mailed on October 24, 2019, Applicant respectfully requests reconsideration of that Decision by transmitting herewith the following documents:

- 1) A Petition to withdraw this application from issue under the provisions of 37 C.F.R. 1.313(c)(2);
- 2) A Request for Continued Examination;
- 3) A Request for Corrected Filing Receipt, including a corrected ADS; and
- 4) All required fees.

Since all requirements for a grantable Petition for Revival of an Application for Patent Abandoned Unintentionally under 37 CFR. 1.137(a) have now been submitted, Applicant respectfully request that this Renewed Petition be granted such that a Corrected Filing Receipt and a new Notice of Allowance be mailed to Applicant.

The Director of Patents and Trademarks is hereby authorized to charge any fees which may be required for consideration of this renewed petition, or to credit any overpayment, to Deposit Account No. 03-2410 (Order No. 30210-163).

Application No. 15/010,345
Renewed Petition under 37 CFR 1.137(a) dtd. 10/25/19

Favorable action is hereby solicited.

Respectfully submitted,

Dated: October 25, 2019

By: /Marlo Schepper Grolnic/
Marlo Schepper Grolnic
Reg. No. 57,194
Agent for Applicant

4817-9151-2235.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Worcester Polytechnic Institute	Examiner: Andrey Shostak
Application Number: 15/010,345	Group Art Unit: 3791
Filed: January 20, 2016	Confirm. No. 2095
For: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS	

BURNS & LEVINSON, LLP
125 High Street
Boston, MA 02110
(617) 345-3000

TO: Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION TO WITHDRAW FROM ISSUE UNDER 37 C.F.R. 1.313(c)(2)

Sir:

Applicant hereby submits this Petition under 37 C.F.R. 1.313(c)(2) to withdraw the above-referenced application from issue in order for the U.S. Patent and Trademark Office (the "Office") to consider the Request for Continued Examination filed herewith. The Request for Continued Examination is filed so that Applicant may request a Corrected Filing Receipt in order to correct a typographical error in the name of an inventor. Specifically, Applicant requests a correction of the second-named inventor in the application from "Jowoon Chong" to -- Jo Woon Chong --. A corrected ADS showing the requested changes is also filed herewith. Accordingly, Applicant requests that a new Notice of Allowance be mailed to Applicant.

As required, this petition is accompanied by the fee set forth in 37 C.F.R. 1.17(h). The Director of Patents and Trademarks is also authorized to charge any fee deficiencies associated with the petition, or to credit overpayments, to Deposit Account No. 03-2410 (Order No. 30210-216).

Application No. 15/010,345
Petition under 37 C.F.R. 1.313(c)(2) dtd. 10/25/19

Favorable action is hereby solicited.

Respectfully submitted,

Date: October 25, 2019

By: /Marlo Schepper Grolnic/
Marlo Schepper Grolnic
Reg. No. 57,194
Agent for Applicant

4826-8637-9927.1

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.

Request for Continued Examination (RCE) Transmittal

Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	15/010,345
Filing Date	January 29, 2016
First Named Inventor	Ki H. Chon
Art Unit	3791
Examiner Name	Andrey Shostak
Attorney Docket Number	30210-216

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. **Submission required under 37 CFR 1.114** Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

- a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.
- i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ii. ☐ Other _____
- b. ☐ Enclosed
- i. ☐ Amendment/Reply
- iii. ☐ Information Disclosure Statement (IDS)
- ii. ☐ Affidavit(s)/ Declaration(s)
- iv. ☐ Other _____

2. Miscellaneous

- a. ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)
- b. ☒ Other Request for Corrected Filing Receipt

3. Fees

- The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
- The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 032410.
- a. ☒ RCE fee required under 37 CFR 1.17(e)
- i. ☒ RCE fee required under 37 CFR 1.17(e)
- ii. ☐ Extension of time fee (37 CFR 1.136 and 1.17)
- iii. ☐ Other _____
- b. ☐ Check in the amount of \$ _____ enclosed
- c. ☐ Payment by credit card (Form PTO-2038 enclosed)
- d. ☒ Payment by EFS-Web

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Signature	/Marlo Schepper Grolnic/	Date	October 25, 2019
Name (Print/Type)	Marlo Schepper Grolnic	Registration No.	57194

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being EFS-Web transmitted to the United States Patent and Trademark Office (USPTO), deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the USPTO on the date shown below.

Signature	/Marlo Schepper Grolnic/
Name (Print/Type)	Marlo Schepper Grolnic
Date	October 25, 2019

This collection of information is required by 37 CFR 1.114. 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 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: Mail Stop RCE, 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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Worcester Polytechnic Institute Examiner: Andrey Shostak
Application Number: 15/010,345 Group Art Unit: 3791
Filed: January 20, 2016 Confirm. No. 2095
For: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION
ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

BURNS & LEVINSON, LLP
125 High Street
Boston, MA 02110
(617) 345-3000

TO: Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**REQUEST FOR CORRECTED FILING RECEIPT
AND SUBMISSION OF CORRECTED ADS**

Sir:

Applicant hereby requests a Corrected Filing Receipt in order to correct a typographical error in the name of an inventor. Specifically, Applicant requests a correction of the second-named inventor in the application from "Jowoon Chong" to -- Jo Woon Chong --, as identified in the Substitute Statement in Lieu of an Oath or Declaration filed by Applicant on May 8, 2019. A corrected ADS is also filed herewith. Accordingly, Applicant submits that the inventors' oaths or declarations were timely filed by the payment of the issue fee on May 13, 2019.

The Director of Patents and Trademarks is authorized to charge any fee deficiencies associated with the request, or to credit overpayments, to Deposit Account No. 03-2410, Order No. 30210-216.

Respectfully submitted,

Date: October 25, 2019

By: /Marlo Schepper Grolnic/
Marlo Schepper Grolnic
Reg. No. 57,194
Agent for Applicant

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		
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		
	Ki	H.	Chon			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Worcester	State/Province	MA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1		c/o Worcester Polytechnic Institute				
Address 2		100 Institute Road				
City	Worcester	State/Province	MA			
Postal Code	01609	Country	US			
Inventor 2					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Jo Woon		Chong			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Worcester	State/Province	MA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1		c/o Worcester Polytechnic Institute				
Address 2		100 Institute Road				
City	Worcester	State/Province	MA			
Postal Code	01609	Country	US			
Inventor 3					Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Duy		Dao			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

City	Malden	State/Province	MA	Country of Residence	US
------	--------	----------------	----	----------------------	----

Mailing Address of Inventor:

Address 1	c/o Worcester Polytechnic Institute				
Address 2	100 Institute Road				
City	Worcester	State/Province	MA		
Postal Code	01609	Country	US		
Inventor 4					Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix	
	Hamed		Salehizadeh		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Worcester	State/Province	MA	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o Worcester Polytechnic Institute				
Address 2	100 Institute Road				
City	Worcester	State/Province	MA		
Postal Code	01609	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).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	26486		
Email Address	docketing@burnslev.com	Add Email	Remove Email

Application Information:

Title of the Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		
Attorney Docket Number	30210-216	Small Entity Status Claimed ☒	
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

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.											
<table border="1"> <tr> <td>Please Select One:</td> <td>☒ Customer Number</td> <td>☐ US Patent Practitioner</td> <td>☐ Limited Recognition (37 CFR 11.9)</td> </tr> <tr> <td>Customer Number</td> <td colspan="3">26486</td> </tr> </table>				Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)	Customer Number	26486		
Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)								
Customer Number	26486										

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	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Present	non provisional of	62109183	2015-01-29
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			

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) ¹ 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 ¹	Filing Date (YYYY-MM-DD)	Access Code ¹ (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			Petitioner Ex-1004, 0423

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

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.

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

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	WORCESTER POLYTECHNIC INSTITUTE
-------------------	---------------------------------

Mailing Address Information For Applicant:			
Address 1	100 INSTITUTE ROAD		
Address 2			
City	WORCESTER	State/Province	MA
Country	US	Postal Code	01609
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 substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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).	
If the Assignee is an Organization check here. ☒	Petitioner Ex-1004, 0425

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	30210-216
		Application Number	
Title of Invention	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS		

Organization Name	WORCESTER POLYTECHNIC INSTITUTE
-------------------	---------------------------------

Mailing Address Information For Non-Applicant Assignee:			
Address 1		100 INSTITUTE ROAD	
Address 2			
City	WORCESTER	State/Province	MA
Country ⁱ	US	Postal Code	01609
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the Add button.

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	/Orlando Lopez/			Date (YYYY-MM-DD)	2016-01-29
First Name	Orlando	Last Name	Lopez	Registration Number	46880
Additional Signature may be generated within this form by selecting the Add button.					

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.**

Electronic Patent Application Fee Transmittal

Application Number:	15010345			
Filing Date:	29-Jan-2016			
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS			
First Named Inventor/Applicant Name:	Ki H. Chon			
Filer:	Marlo Schepper Grolnic			
Attorney Docket Number:	30210-216			
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:				
PETITION FEE-37CFR 1.17(H) (GROUP II)	2464	1	70	70
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
RCE- 1ST REQUEST	2801	1	650	650
Total in USD (\$)				720

Electronic Acknowledgement Receipt

EFS ID:	37565473
Application Number:	15010345
International Application Number:	
Confirmation Number:	2095
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS
First Named Inventor/Applicant Name:	Ki H. Chon
Customer Number:	26486
Filer:	Marlo Schepper Grolnic
Filer Authorized By:	
Attorney Docket Number:	30210-216
Receipt Date:	25-OCT-2019
Filing Date:	29-JAN-2016
Time Stamp:	15:00:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 720
RAM confirmation Number	E201900F01248456
Deposit Account	032410
Authorized User	Marlo Grolnic

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

Petitioner Ex-1004, 0429

37 CFR 1.19 (Document supply fees)
 37 CFR 1.20 (Post Issuance fees)
 37 CFR 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		162RenewedPetition.pdf	3004401	yes	12
			e62c839cbcd41d35a010f3d3efe031344ce12a65		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Petition for review by the Office of Petitions		1	2	
	Petition to Withdraw from Issue		3	4	
	Request for Continued Examination (RCE)		5	5	
	Request for Corrected Filing Receipt		6	6	
	Application Data Sheet		7	12	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32243	no	2
			3e02aa21ddfb36edb1baef8e53bb1896a49c1286		
Warnings:					
Information:					
Total Files Size (in bytes):			3036644		

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.



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 NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/010,345	01/29/2016	3791	1440	30210-216	36	3

26486
BURNS & LEVINSON, LLP
125 HIGH STREET
BOSTON, MA 02110

CONFIRMATION NO. 2095 REPLACEMENT FILING RECEIPT



Date Mailed: 10/30/2019

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

Ki H. Chon, Worcester, MA;
Jo Woon Chong, Worcester, MA;
Duy Dao, Malden, MA;
Hamed Salehizadeh, Worcester, MA;

Applicant(s)

WORCESTER POLYTECHNIC INSTITUTE, WORCESTER, MA;

Assignment For Published Patent Application

WORCESTER POLYTECHNIC INSTITUTE, WORCESTER, MA

Power of Attorney: The patent practitioners associated with Customer Number 26486

Domestic Priority data as claimed by applicant

This appln claims benefit of 62/109,183 01/29/2015

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 Application via Priority Document Exchange: No

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 10/28/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/010,345**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR
PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

Preliminary Class

600

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

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

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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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/010,345	01/29/2016	Ki H. Chon	30210-216	2095

26486 7590 11/05/2019
BURNS & LEVINSON, LLP
125 HIGH STREET
BOSTON, MA 02110

EXAMINER

SHOSTAK, ANDREY

ART UNIT	PAPER NUMBER
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3791

NOTIFICATION DATE	DELIVERY MODE
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11/05/2019

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):

docketing@burnslev.com



UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

In re Application of :
Chon et al. :
Application No. 15/010,345 :
Filed: 29 Jan 2016 : **DECISION ON PETITION**
For: MOTION AND NOISE ARTIFACT DETECTION :
AND RECONSTRUCTION ALGORITHMS FOR :
PHOTOPLETHYSMOGRAM AND EQUIVALENT :
SIGNALS :

This is a decision on the renewed petition pursuant to 37 CFR 1.137(a), filed October 25, 2019, to revive the above-identified application.

The petition is **GRANTED**.

The application became abandoned for failure to timely file the inventor's oath or declaration no later than the date on which the issue fee was paid. No inventor's oath or declaration having been received, the application became abandoned by operation of law on May 14, 2019. The Office mailed a Notice of Abandonment on May 20, 2019.

The petition satisfies the requirements of 37 CFR 1.137(a) in that the petitioner has supplied (1) an application data sheet; (2) the petition fee of \$1000.00; and (3) a statement of unintentional delay.

A review of the record indicates the request under 37 CFR 1.48 has been entered before the rendering of a decision on the petition under 37 CFR 1.137(a). While a corrected filing receipt and a Notice of Acceptance of Request of 37 CFR 1.48(f) that accepted the 1.48 was mailed on May 23, 2019, it was mailed prematurely. With the filing of the petition to withdraw this application from issue under the provisions of 37 CFR 1.313(c)(2) and a Request for Continued Examination under 37 CFR 1.114 along with a petition under 37 CFR 1.137(a) filed on October 25, 2019, the petition under 37 CFR 1.48 filed on May 20, 2019 became grantable and is **accepted nunc pro tunc**.

It is noted that the petition under 37 CFR 1.313(c) Withdrawal from Issue submitted on October 25, 2019 will be processed in due course.

Telephone inquiries concerning this decision should be directed to Paula Britton at 571-272-1556. All other inquiries concerning the examination or status of the application is accessible in the PAIR system at <http://portal.uspto.gov/>.

This application will be forwarded to Group Art Unit 3791 for appropriate action in the normal course of business on the RCE submitted in accordance with 37 CFR 1.114.

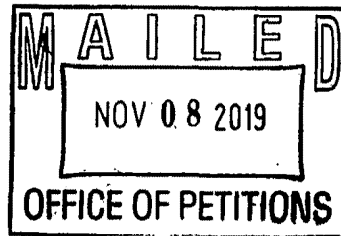
/Irvin Dingle/
Irvin Dingle
Lead Paralegal Specialist
Office of Petitions



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Alexandria, VA 22313-1450
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BURNS & LEVINSON, LLP
125 HIGH STREET
BOSTON MA 02110



In re Application of
Ki H. Chon, et al
Application No. 15/010,345
Filed: January 29, 2016
Attorney Docket No. 30210-216

:
:
: DECISION GRANTING PETITION
: UNDER 37 CFR 1.313(c)(2)
:

This is a decision on the petition filed October 25, 2019 under 37 CFR 1.313(c)(2), to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED**.

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). See 37 CFR 1.313(c)(2).

Petitioner is advised that the issue fee paid on May 13, 2019 in the above-identified application cannot be refunded. If, however, the above-identified application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance.¹

Telephone inquiries should be directed to Irvin Dingle at (571) 272-3210.

This matter is being referred to Technology Center AU 3791 for processing of the request for continued examination under 37 CFR 1.114 and for consideration of the request under 37 CFR 1.48(f) filed May 20, 2019.

/Irvin Dingle/
Irvin Dingle
Lead Paralegal Specialist
Office of Petitions

¹ The request to apply the issue fee to the new Notice may be satisfied by completing and returning the new Issue Fee Transmittal Form PTOL-85(b), which includes the following language thereon: Commissioner for Patents is requested to apply the Issue Fee and Publication Fee (if any) or re-apply any previously paid issue fee to the application identified above. Petitioner is advised that, whether a fee is indicated as being due or not, the Issue Fee Transmittal Form **must** be completed and timely submitted to avoid abandonment. Note the language in bold text on the first page of the Notice of Allowance and Fee(s) Due (PTOL-85).



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NOTICE OF ALLOWANCE AND FEE(S) DUE

26486 7590 01/08/2020
BURNS & LEVINSON, LLP
125 HIGH STREET
BOSTON, MA 02110

EXAMINER

SHOSTAK, ANDREY

ART UNIT

PAPER NUMBER

3791

DATE MAILED: 01/08/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/010,345	01/29/2016	Ki H. Chon	30210-216	2095

TITLE OF INVENTION: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$500.00	\$0	04/08/2020

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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

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)

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.

26486 7590 01/08/2020
BURNS & LEVINSON, LLP
125 HIGH STREET
BOSTON, MA 02110

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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/010,345	01/29/2016	Ki H. Chon	30210-216	2095

TITLE OF INVENTION: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$500.00	\$0	04/08/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
SHOSTAK, ANDREY	3791	600-500000

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 03-09 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,

1 _____

(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.

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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). 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. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

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.

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.

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. _____



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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/010,345	01/29/2016	Ki H. Chon	30210-216	2095
26486	7590	01/08/2020	EXAMINER	
BURNS & LEVINSON, LLP			SHOSTAK, ANDREY	
125 HIGH STREET			ART UNIT	
BOSTON, MA 02110			PAPER NUMBER	
			3791	
DATE MAILED: 01/08/2020				

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 30 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. 15/010,345	Applicant(s) Chon et al.	
	Examiner ANDREY SHOSTAK	Art Unit 3791	AIA (FITF) 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 the Request for Continued Examination of 10/25/2019.
☐ 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 See Continuation Sheet. 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 ____. 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 _____.
---	--

/ANDREY SHOSTAK/ Examiner, Art Unit 3791	/NAVIN NATNITHITHADHA/ Primary Examiner, Art Unit 3791
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Continuation of 3. The allowed claim(s) is/are: 1,8,10-11,13-18,25,27-28 and 30-36

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 10/24/2019 has been entered.
3. In view of the petitions granted on 11/05/2019 and 11/08/2019, and the Corrected Filing Receipt of 10/30/2019, the updated inventorship has been considered and the claims in the Notice of Allowance of 02/14/2019 (entered via Examiner's Amendment) remain allowable for the reasons already provided.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANDREY SHOSTAK whose telephone number is (408)918-7617. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor II can be reached on (571) 272-4730. 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.

/ANDREY SHOSTAK/
Examiner, Art Unit 3791

**/NAVIN NATNITHITHADHA/
Primary Examiner, Art Unit 3791**

<i>Index of Claims</i> 	Application/Control No. 15/010,345	Applicant(s)/Patent Under Reexamination Chon et al.
	Examiner ANDREY SHOSTAK	Art Unit 3791

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

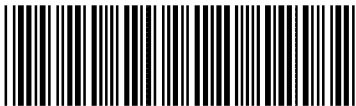
CLAIMS										
☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47										
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	2	✓	-	-						
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	36	✓	=	=						

Issue Classification 	Application/Control No. 15/010,345	Applicant(s)/Patent Under Reexamination Chon et al.
	Examiner ANDREY SHOSTAK	Art Unit 3791

CPC						
Symbol					Type	Version
A61B	/	5	/	7207	F	2013-01-01
A61B	/	5	/	02416	I	2013-01-01
A61B	/	5	/	7257	I	2013-01-01
A61B	/	5	/	1455	I	2013-01-01
A61B	/	5	/	725	I	2013-01-01
A61B	/	5	/	7267	I	2013-01-01

CPC Combination Sets					
Symbol				Type	Version
	/		/		

/ANDREY SHOSTAK/ Examiner, Art Unit 3791 (Assistant Examiner)	12 December 2019 (Date)	Total Claims Allowed: 20	
/NAVIN NATNITHITHADHA/ Primary Examiner, Art Unit 3791 (Primary Examiner)	22 December 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 6

Issue Classification 	Application/Control No. 15/010,345	Applicant(s)/Patent Under Reexamination Chon et al.
	Examiner ANDREY SHOSTAK	Art Unit 3791

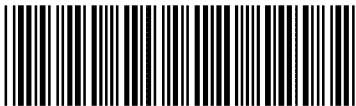
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CLAIMED			
A61B	/	5	/ 02

NON-CLAIMED			
/		/	

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

/ANDREY SHOSTAK/ Examiner, Art Unit 3791 (Assistant Examiner)	12 December 2019 (Date)	Total Claims Allowed: 20	
/NAVIN NATNITHITHADHA/ Primary Examiner, Art Unit 3791 (Primary Examiner)	22 December 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 6

Issue Classification 	Application/Control No. 15/010,345	Applicant(s)/Patent Under Reexamination Chon et al.
	Examiner ANDREY SHOSTAK	Art Unit 3791

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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2	8	11	25	20	36										
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5	15	14	32												
6	16	15	33												
7	17	16	34												

/ANDREY SHOSTAK/ Examiner, Art Unit 3791 (Assistant Examiner)	12 December 2019 (Date)	Total Claims Allowed: 20	
/NAVIN NATNITHITHADHA/ Primary Examiner, Art Unit 3791 (Primary Examiner)	22 December 2019 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 6

<i>Search Notes</i> 	Application/Control No. 15/010,345	Applicant(s)/Patent Under Reexamination Chon et al.
	Examiner ANDREY SHOSTAK	Art Unit 3791

CPC - Searched*		
Symbol	Date	Examiner
A61B5/7207,1455,7267,725,7257,02416	09/05/2018	AS

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Inventor search in PALM and EAST	09/05/2018	AS
Text search in EAST	09/05/2018	AS
Classification search in EAST, limited by text and/or date	09/05/2018	AS
Updated inventor search	12/12/2019	AS
Assignee/Applicant search	12/12/2019	AS

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
See listed classifications	EAST text search (see attached history)	01/17/2019	AS

/ANDREY SHOSTAK/ Examiner, Art Unit 3791	
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EAST Search History

EAST Search History (Prior Art)

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L1	1	(chong with jo with woon).as,aanm,in. and (ppg or pleth or \$5plethysmogra\$)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2019/12/12 07:30
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S4	1	("20130191035").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/05 13:51
S5	12	("20060122476" "20090326349" "20100016693" "20080287815" "20100298656").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/05 13:52
S6	1	("20130190638").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/05 13:56
S7	0	("("20110158259").PN. ").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/05 13:57
S8	2	("20110158259").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/05 13:57
S9	1	("20160367198").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/05 13:59
S10	1	("20160361021").PN.	US-PGPUB;	OR	OFF	2018/09/05

			USPAT; USOCR			14:03
S11	16	("9713428" "20140309943" "9872652" "8945017").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/05 14:04
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S13	2	("20080287815" "20110077484").PN.	US-PGPUB; USPAT	OR	ON	2018/09/05 14:31
S14	42757	(A61B5/7207 or A61B5/1455 or A61B5/7267 or A61B5/725 or A61B5/7257 or A61B5/02416).cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/05 15:08
S15	2	S14 and time adj frequency adj spectrum and (\$5plethysmogra\$4 or pleth or ppg) and motion with noise with artifact and support with vector with machine	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/05 15:12
S16	12	S14 and time adj frequency adj spectrum and (\$5plethysmogra\$4 or pleth or ppg) and motion with noise with artifact	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/05 15:12
S17	4	((("20120190947") or ("20130144180") or ("20130191035") or ("8755876")).PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/05 15:18
S18	16	S14 and time adj frequency adj spectr\$2 and (\$5plethysmogra\$4 or pleth or ppg) and motion with noise with artifact	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/05 15:19
S19	4	S18 not S16	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/05 15:19
S20	16	(vfcdm or variable with frequency with complex with demodulation) with (tfs or time adj frequency adj spectr\$2)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/05 15:22
S21	17	(vfcdm or variable with frequency with complex with demodulation) and (\$5plethysmogra\$4 or pleth or ppg)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2018/09/05 15:24

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S23	737	(\$plethysmogra\$ or pleth or ppg) and (svm or support adj vector adj machine)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 08:18
S24	263	(\$plethysmogra\$ or pleth or ppg) and (svm or support adj vector adj machine) and (motion with noise)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 08:18
S25	3	S24 and (time adj frequency adj spectr\$2)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 08:19
S26	148	S24 and harmonic	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 08:19
S27	2	S22 and noise adj quality adj index	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 08:20
S28	30	S26 and total adj power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 08:22
S29	4	S22 and projected adj difference	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 08:28
S30	4	S22 and residual adj noise adj power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 08:31
S31	128	extract with trace with power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	ON	2018/09/06 09:38

			IBM_TDB			
S32	340	extract\$3 with trace with power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 09:38
S33	16	extract\$3 with trace with power with noise	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 09:39
S34	362	extract\$3 with (band or scale) with power with noise	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 09:40
S35	623	(extract\$3 or subtract\$3) with (band or scale) with power with noise	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 09:41
S36	403	(extract\$3 or subtract\$3) with (band or scale) with (fundamental or dominant) adj frequency	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 09:41
S37	5	(extract\$3 or subtract\$3) with (band or scale) with (fundamental or dominant) adj frequency same noise same power	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 09:42
S38	10	(extract\$3 or subtract\$3) with (band or scale) with (fundamental or dominant) adj frequency and (\$5plethysmogra\$4 or pleth or ppg)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 09:42
S39	1	("20160022164").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/06 10:06
S40	16	"2013043157"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 10:28
S41	24	heart adj rate with frequency adj difference	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 10:57
S42	356	heart adj rate with frequency with difference	US-PGPUB; USPAT;	OR	ON	2018/09/06 10:59

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S43	14	heart adj rate with time adj domain with (dominant or fundamental) adj frequency	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 11:00
S44	44	heart adj rate with harmonic same (spectrogram or scalogram)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 13:29
S45	0	(fundamental or dominant) with frequency same peak adj to adj peak with interval	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 15:18
S46	0	(fundamental or dominant) with frequency same peak adj to adj peak	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 15:18
S47	1674	(fundamental or dominant) with frequency same peak adj3 peak	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 15:18
S48	63	(fundamental or dominant) with frequency same peak adj3 peak with interval	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 15:18
S49	39	(fundamental or dominant) with frequency same peak adj3 peak with interval with frequency	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 15:19
S50	57	noise adj3 quality adj3 index	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/06 15:24
S51	576	heart adj rate with spectr\$2 same2 heart adj rate with interval	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/07 07:03
S52	86	heart adj rate with spectr\$2 same heart adj rate with interval same	US-PGPUB; USPAT;	OR	ON	2018/09/07 07:12

		(difference or compar\$4)	USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S53	4	heart adj rate with spectr\$2 same heart adj rate with interval same (difference or compar\$4) same noise	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/07 07:17
S54	179	noise same heart adj rate same (frequency with differen\$3 or projected adj differen\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/07 09:26
S55	97	noise same heart adj rate with (frequency with differen\$3 or projected adj differen\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/07 09:27
S56	1	noise same (heart or pulse) adj rate with differen\$3 with (time adj domain or peak adj3 peak or interval) with (frequency adj domain or (dominant or fundamental) with frequency)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/09/07 10:12

EAST Search History (I nterference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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12/ 12/ 2019 8:54:38 AM
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artifact detection and reconstruction algorithms for photoplethysmogram and equivalent
signals.wsp

Bibliographic Data

Application No: 15/010,345

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged: /ANDREY SHOSTAK/

Examiner's Signature

Initials

Title:

MOTION AND NOISE ARTIFACT DETECTION AND
RECONSTRUCTION ALGORITHMS FOR
PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/29/2016	600	3791	
RULE			

APPLICANTS

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Hamed Salehizadeh Worcester, MA, UNITED STATES

CONTINUING DATA

This application has PRO of 62109183 01/29/2015

FOREIGN APPLICATIONS

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10/28/2019

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Application Number	15/010345
Filing Date	January 29, 2016
First Named Inventor	Ki H. Chon
Art Unit	3791
Examiner Name	Andrey Shostak
Attorney Docket Number	30210-216

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Applicant/Inventor

Assignee of record of the entire interest.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).Attorney or agent of record. Registration Number 46880

Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number _____

Signature

/Orlando Lopez/

Typed or Printed
Name

Orlando Lopez

Date

April 6, 2020

Telephone

978-394-2719

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.



*Total of _____ forms are submitted.

This collection of information is required by 37 CFR 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.

Electronic Acknowledgement Receipt

EFS ID:	39068901
Application Number:	15010345
International Application Number:	
Confirmation Number:	2095
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS
First Named Inventor/Applicant Name:	Ki H. Chon
Customer Number:	26486
Filer:	Orlando Lopez
Filer Authorized By:	
Attorney Docket Number:	30210-216
Receipt Date:	06-APR-2020
Filing Date:	29-JAN-2016
Time Stamp:	12:01:28
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	wpi-216_fee_transmit.pdf	296358	no	1
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Warnings:

Petitioner Ex-1004, 0461

Information:					
2	Change of Address	wp-216_Change_of_Address.pdf	226609	no	1
			fec95bc288812b78f80eb80b0f5547f1ea784073		
Warnings:					
Information:					
Total Files Size (in bytes):				522967	
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.					

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EPS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

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)

26486 7590 01/08/2020
BURNS & LEVINSON, LLP
125 HIGH STREET
BOSTON, MA 02110

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 transmitted to the USPTO via EPS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/010,345	01/29/2016	Ki H. Chon	30210-216	2095

TITLE OF INVENTION: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$500.00	\$0	04/08/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
SHOSTAK, ANDREY	3791	600-500000

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 03-09 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. Culhane Meadows

2. Orlando Lopez

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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Wavefront Research Inc.

(B) RESIDENCE, CITY AND STATE OR COUNTRY

1540 Main Street

Northampton, PA 18067

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

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via EPS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No.

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

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.

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.

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 April 6, 2020

Typed or printed name Orlando Lopez

Registration No. 46880

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: **(571)-273-2885**

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)

25486 7590 01/08/2020
BURNS & LEVINSON, LLP
125 HIGH STREET
BOSTON, MA 02110

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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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

Orlando Lopez (Typed or printed name)
[Signature] (Signature)
April 6, 2020 (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/010,345	01/29/2016	Ki H. Chou	30210-216	2095

TITLE OF INVENTION: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$500	\$0.00	\$500.00	\$0	04/08/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
SBOSTAK, ANDREY	3791	600-500000

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 03-09 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. **Culhane Meadows**

2. **Orlando Lopez**

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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Wavefront Research Inc.

(B) RESIDENCE, CITY and STATE OR COUNTRY

1540 Main Street

Northampton, PA 18067

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

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

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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.

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: **April 6, 2020**

Typed or printed name: **Orlando Lopez**

Registration No. **46888**

Electronic Acknowledgement Receipt

EFS ID:	39069892
Application Number:	15010345
International Application Number:	
Confirmation Number:	2095
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS
First Named Inventor/Applicant Name:	Ki H. Chon
Customer Number:	26486
Filer:	Orlando Lopez
Filer Authorized By:	
Attorney Docket Number:	30210-216
Receipt Date:	06-APR-2020
Filing Date:	29-JAN-2016
Time Stamp:	12:52:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	wpi-216_fee_transmit2.pdf	301084	no	1
			836b5f663badeac62552df0ba49abec088d a7dc7		

Warnings:

Petitioner Ex-1004, 0465

Information:	
Total Files Size (in bytes):	301084
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.	



United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :C46472

Sale Accounting Date:04/07/2020

Sale Item Reference Number
15010345

Effective Date
04/06/2020

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I202047821007170	2501	UTILITY APPL ISSUE FEE	\$500.00	Salea



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.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/010,345	05/19/2020	10653362	30210-216	2095

116025 7590 04/29/2020
Culhane Meadows PLLC
534 Medlock Road Suite 103
Decatur, GA 30030

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 669 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):

Ki H. Chon, Worcester, MA;
WORCESTER POLYTECHNIC INSTITUTE, WORCESTER, MA;
Jo Woon Chong, Worcester, MA;
Duy Dao, Malden, MA;
Hamed Salehizadeh, Worcester, MA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Ki H. Chon

Examiner: SHOSTAK, ANDREY

Application No.: 15/010,345

Confirm. No.: 2095

Filed: January 29, 2016

Art Unit: 3735

Patent No. 10,653,362 B1

Issued: May 19, 2020

For: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION
ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

CULHANE MEADOWS PLLC
75 State Street
Boston, MA 02019
(978) 394-2719

To: Attention Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR A CERTIFICATE OF CORRECTION UNDER 37 CFR 1.323

Sir:

In the matter of U.S. Patent No. 10,653,362 issued May 19, 2020, a comparison of same against the files of the attorney of record indicates that the error described in the attached Form PTO/SB/44 was made by the Applicant's representative

More specifically, the following error, corrected in Form PTO/SB/44, is of a clerical nature:

The assignee is listed as
Wavefront Research Inc.
Nothampton, PA

However, a search of the assignment would reveal that patent is assigned, as recorded in Reel 04982, Frame 0544 to
Worcester Polytechnic Institute

Worcester, MA

The error occurred due to a typographical error in Form PTOL-85, Fee Transmittal.

REMARKS

Under 35 U.S.C. 255, whenever a mistake of a clerical or typographical nature, or of minor character, which was not the fault of the Patent and Trademark Office, appears in a patent and a showing has been made that such mistake occurred in good faith, the Director may, upon payment of the required fee, issue a certificate of correction. The correction does not involve such changes in the patent as would constitute new matter or would require re-examination. The correct assignee is listed in the assignment recoded in Reel 04982, Frame 0544 on April 24, 2019. Since all changes were clearly disclosed by the records filed with the Office, Applicant respectfully requests a Certificate of Correction.

The following information is presented in the event that a call may be deemed desirable by the USPTO:

ORLANDO LOPEZ (978) 394-2719.

Respectfully submitted,

Dated: May 20, 2020

By: /Orlando Lopez/
Orlando Lopez
Reg. No. 46,880
Attorney for Patent Application Owner

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**Page 1 of 1

PATENT NO. : 10653362

APPLICATION NO.: 15/010345

ISSUE DATE : May 19, 2020

INVENTOR(S) : KI H Chon, Jo Woon Chong, Duy Dao, Hamed Salehzadeh

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Assignee: Worcester Polytechnic Institute
Worcester, MA

MAILING ADDRESS OF SENDER (Please do not use Customer Number below):

534 Medlock Road Suite 103
Dacula Ga 30030

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. 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 1.0 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: Attention Certificate of Corrections Branch, 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.

Petitioner Ex-1004, 0471

Electronic Patent Application Fee Transmittal

Application Number:	15010345			
Filing Date:	29-Jan-2016			
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS			
First Named Inventor/Applicant Name:	Ki H. Chon			
Filer:	Orlando Lopez			
Attorney Docket Number:	30210-216			
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:				
CERTIFICATE OF CORRECTION	2811	1	150	150

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				150

Electronic Acknowledgement Receipt

EFS ID:	39490809
Application Number:	15010345
International Application Number:	
Confirmation Number:	2095
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS
First Named Inventor/Applicant Name:	Ki H. Chon
Customer Number:	116025
Filer:	Orlando Lopez
Filer Authorized By:	
Attorney Docket Number:	30210-216
Receipt Date:	20-MAY-2020
Filing Date:	29-JAN-2016
Time Stamp:	11:52:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 150
RAM confirmation Number	E20205JB54529767
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	WPI-216_Req_Cert_of_Corr.pdf	400025	no	3
			4a25f234508c58bf277a3cea0820a71a18ee f8c3		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30378	no	2
			c42b6b99c2a561076331042afc85d060b3e 0b6c9		
Warnings:					
Information:					
Total Files Size (in bytes):			430403		
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.					



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/010,345	01/29/2016	Ki H. Chon	WPI-216	2095
116025	7590	06/02/2020	EXAMINER	
Culhane Meadows PLLC			SHOSTAK, ANDREY	
534 Medlock Road Suite 103				
Decatur, GA 30030				
			ART UNIT	PAPER NUMBER
			3791	
			NOTIFICATION DATE	DELIVERY MODE
			06/02/2020	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):

eOfficeAction@AppColl.com
patentdocket@cm.law
sanderson@cm.law

**Response to the
Request for
Certificate of Correction**

Patent No.
10653362

Applicant(s)
Chon et al.

Issue Date
05/19/2020

Docket No.
WPI-216

This is in response to the request for a Certificate of Correction filed 20 May 2020

☒ **Request Denied** - Consideration has been given to your request for the issuance of a Certificate of Correction under the provisions of 37 CFR 1.322 and/or 37 CFR 1.323. The Request is improper and denied for the reason(s) below:

1. ☒ Assignees' names and addresses (assignment data) printed in a patent, are based solely on information supplied in the appropriate space for identifying the assignment data on the Issue Fee Transmittal Form (PTOL-85b). Any request for a patent to be corrected to state the name of the assignee, must state that the assignment was submitted for recordation as set forth in 37 CFR 3.11 before issuance of the patent. Petition under 3.81 is to be filed for consideration of correction to assignee. The petition fee set forth in 37 CFR 1.17(i)(1) (currently \$140, \$70, \$35 for large, small and micro entities, respectively).
2. ☐ The alleged error in _____, is in fact an Amendment and/or Change made by the examiner and considered to be in accordance with the permissible amendments enumerated in the Manual of Patent Examining Procedure (MPEP) Section 1302.04. Applicant did not file objection or amendment under 37 CFR 1.312 prior to payment of the issue fee.
3. ☐ A petition under CFR 1.182 is required to correct the alleged errors in spelling or order of inventor's names, since inventor's names are printed solely in accordance with the type-written names, and in the order of the type-written names on the Application Data Sheet (ADS). The required fee currently under rule 1.17(f) (small entity \$200, large entity \$400, micro entity fee \$100).
4. ☐ With respect to the alleged error in changing the inventor name on the patent due to clerical error in ADS/OATH of related patents. The inventors name is printed in accordance with the OATH/ADS submitted at the time of filing the application. However, your attention is directed to C.F.R. 1.324, wherein a request is being made to change, add or delete inventor(s), after issuance of the patent.
5. ☐ With respect to the alleged error in _____, comparison of the printed patent with the corresponding location in the application file reveals that there is no discrepancy.
6. ☐ With respect to 37 CFR 1.72, the title should be brief but technically accurate and descriptive and should contain fewer than 500 characters. Inasmuch as the words "new," "improved," "improvement of," and "improvement in" are not considered as part of the title of an invention, these words should not be included at the beginning of the title of the invention and will be deleted when the Office enters the title into the Offices computer records, and when any patent issues.
7. ☐ The fee for correction under 37 CFR 1.323 is set forth in 37 CFR 1.20(a). ☐ Partial fee ☐ No fee was received with your request. Full fee payment is required before further action is taken on this request.
8. ☐ With respect to the request for corrected Letters Patent (Grant), corrections to the original Letters Patent are made under the provisions of Rule 1.322(b), not Rule 1.323, unless a petition is granted.
9. ☐ Other Comments: _____

Further correspondence concerning this matter should be filed and directed to the Certificates of Correction Branch.

Legal Instrument Examiner: /DORIS M BURNS/
LIE, ODM

Phone: (703)756-1958

Certificates of Correction Branch email: CustomerServiceCoC@uspto.gov

CoC Central Phone Number: (703)756-1814

If applicable, information regarding a petition under 37 CFR 1.183 should be directed to the attention of the Commissioner for Patents using the FAX number (571) 273-8300

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Ki H. Chon Examiner: SHOSTAK, ANDREY
Application No.: 15/010,345 Confirm. No.: 2095
Filed: January 29, 2016 Art Unit: 3735
Patent No. 10,653,362 B1 Issued: May 19, 2020
For: MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION
ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS

CULHANE MEADOWS PLLC
75 State Street
Boston, MA 02019
(978) 394-2719

To: Attention Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR A CERTIFICATE OF CORRECTION UNDER 37 CFR 1.323

Sir:

In the matter of U.S. Patent No. 10,653,362 issued May 19, 2020, a comparison of same against the files of the attorney of record indicates that the error described in the attached Form PTO/SB/44 was made by the Applicant's representative

More specifically, the following error, corrected in Form PTO/SB/44, is of a clerical nature:

The assignee is listed as
Wavefront Research Inc.
Nothampton, PA

An assignment, a copy of which is attached, to Worcester Polytechnic Institute was submitted on April 24, 2019, before the issue date of May 19, 2020, and is recorded in Reel 04982, Frame 0544 to

Worcester Polytechnic Institute
Worcester, MA

The error occurred due to a typographical error in Form PTOL-85, Fee Transmittal.

REMARKS

Under 35 U.S.C. 255, whenever a mistake of a clerical or typographical nature, or of minor character, which was not the fault of the Patent and Trademark Office, appears in a patent and a showing has been made that such mistake occurred in good faith, the Director may, upon payment of the required fee, issue a certificate of correction. As stated in 37 CFR 3.81(b), this request for the 10,653,362 patent to be corrected to state the correct name of the assignee, states that the assignment was submitted for recordation as set forth in § 3.11 before the issuance of the patent, and includes a request for a certificate of correction under § 1.323. The correction does not involve such changes in the patent as would constitute new matter or would require re-examination. The correct assignee is listed in the assignment recoded in Reel 04982, Frame 0544 on April 24, 2019. Since all changes were clearly disclosed by the records filed with the Office, Applicant respectfully requests a Certificate of Correction.

The following information is presented in the event that a call may be deemed desirable by the USPTO:

ORLANDO LOPEZ (978) 394-2719.

Respectfully submitted,

Dated: June 2, 2020

By: /Orlando Lopez/
Orlando Lopez
Reg. No. 46,880
Attorney for Patent Application Owner

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

Page 1 of 1

PATENT NO. : 10653362

APPLICATION NO.: 15/010345

ISSUE DATE : May 19, 2020

INVENTOR(S) : Ki H Chon, Jo Woon Chong, Duy Dao, Hamed Salehzadeh

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Assignee: Worcester Polytechnic Institute
Worcester, MA

MAILING ADDRESS OF SENDER (Please do not use Customer Number below):

534 Medlock Road Suite 103
Dacatur Ga 30030

This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. 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 1.0 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: Attention Certificate of Corrections Branch, 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.

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT5490123

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT
CONVEYING PARTY DATA	
Name	Execution Date
KI H. CHON	03/18/2019
HAMED SALEHIZADEH	03/22/2019
DUY DAO	04/09/2019
RECEIVING PARTY DATA	
Name:	WORCESTER POLYTECHNIC INSTITUTE
Street Address:	100 INSTITUTE ROAD
City:	WORCESTER
State/Country:	MASSACHUSETTS
Postal Code:	01609
PROPERTY NUMBERS Total: 1	
Property Type	Number
Application Number:	15010345
CORRESPONDENCE DATA	
Fax Number:	(617)345-3299
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
Phone:	6173453000
Email:	docketing@burnslev.com
Correspondent Name:	BURNS & LEVINSON LLP
Address Line 1:	125 SUMMER STREET
Address Line 4:	BOSTON, MASSACHUSETTS 02110
ATTORNEY DOCKET NUMBER:	30210-216
NAME OF SUBMITTER:	ORLANDO LOPEZ
SIGNATURE:	/Orlando Lopez/
DATE SIGNED:	04/24/2019
Total Attachments: 5	
source=4656_001#page1.tif	
source=4656_001#page2.tif	
source=4656_001#page3.tif	
source=4656_001#page4.tif	

ASSIGNMENT

WHEREAS, we, Ki H. Chen, a resident of Worcester, MA; Jowoon Chong, a resident of Worcester, MA; Duy Dao a resident of Malden, MA; and Hamed Salehizadeh, a resident of Worcester, MA (hereinafter referred to collectively as "Assignors"); have jointly made an invention entitled MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM SIGNALS, which claims priority to U.S. Provisional Application Serial No. 62/109,183, filed on 01-29-2015 and for which an application for a United States Patent was filed on 01-29-2016 and accorded U.S. Patent Application Serial No. 15/010,345.

WHEREAS, Worcester Polytechnic Institute, a corporation organized and existing under the laws of Massachusetts, having its principal place of business at 100 Institute Road, Worcester, Massachusetts 01619 (hereinafter referred to as "Assignee"), is desirous of acquiring right, title and interest in said invention.

NOW, THEREFORE, in consideration of One Dollar (\$1.00), and other good and valuable consideration, the receipt of which is hereby acknowledged, Assignors by these presents, do sell, assign and transfer to Assignee, Assignors entire right, title and interest, for the United States of America and its possessions and territories and for all foreign countries, in and to said invention, including all rights of priority created and conferred by any treaty or international convention which is available in connection with said invention, including the right to apply for patent rights, U.S. or foreign, and in any provisionals, utilities, continuations, divisions, substitutes, renewals, reissues or other applications filed in the U.S. or abroad (including multinational filing arrangements of all kinds), and in any U.S. or foreign patents issued on any such applications and reissues, extensions and renewals thereof, to be held and enjoyed by Assignee, for its own use and behalf and for its successors and assigns, to the full ends of the terms or extended terms for which any Letters Patents or the like may be granted, as fully and entirely as the same would have been held by Assignors had this sale, assignment and transfer not been made.

Assignors hereby authorize and request the Commissioner of Patents of the United States, and any official of any country or countries (including multinational filing arrangements of all kinds), whose duty it is to receive and/or examine applications for patents or similar intellectual/industrial property, issue patents or other evidence or forms of intellectual/industrial property protection on applications as aforesaid, to issue the same to Assignee, its successors and assigns, in accordance with the terms of this instrument.

Assignors covenant with Assignee, its successors, assigns, and legal representatives that Assignors have full right to convey the entire interest herein assigned, and that Assignors have not executed any agreement in conflict herewith and will not execute any agreement or conveyance in conflict herewith.

Attorney Docket No. 30210-216

Assignors further covenant and agree to communicate to Assignee, its successors, legal representatives and assigns, any facts known to Assignors respecting said invention, and testify in any legal proceeding, sign all lawful papers, including, without limitation, application papers, assignments, powers of attorney, declarations, and other instruments, execute all divisional, continuing, substitute, reissue, renewal and foreign applications, make all truthful oaths, declarations and statements, and generally do everything reasonably requested of Assignors by Assignee, or its successors or assigns to aid Assignee, its successors or assigns, to obtain, enforce and/or exploit said invention.

Signature: *Ki H. Chon*

Legal Name of Inventor: Ki H. Chon

Date: 3/18/19

Witness: *Birgit Sawstrom*

(Print name of Witness)

Date: _____

Witness: *Sowmya Ramech*

(Print name of Witness)

Date: 3/18/2019

Attorney Docket No. 30210-216

Signature: _____
Legal Name of Inventor: Jowoon Chong

Date: _____

Witness:

(Print name of Witness)

Date: _____

Witness:

(Print name of Witness)

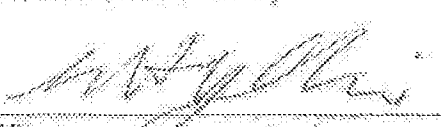
Date: _____

Signature: 
Legal Name of Inventor: Hamed Salehizadeh

Date: 03/22/2019

Witness: 
Mina Shojaeizadeh
(Print name of Witness)

Date: 3/22/2019

Witness: 
Mahdi Heydari
(Print name of Witness)

Date: 3/22/2019

Signature: [Signature]
Legal Name of Inventor: Duy Dao

Date: 9/9/19

Witness: [Signature]
ANH HO
(Print name of Witness)

Date: 09/09/19

Witness: [Signature]
MINH TRINH
(Print name of Witness)

Date: 09/09/19

Electronic Patent Application Fee Transmittal

Application Number:	15010345			
Filing Date:	29-Jan-2016			
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS			
First Named Inventor/Applicant Name:	Ki H. Chon			
Filer:	Orlando Lopez			
Attorney Docket Number:	WPI-216			
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:				
CERTIFICATE OF CORRECTION	2811	1	150	150

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				150

Electronic Acknowledgement Receipt

EFS ID:	39604755
Application Number:	15010345
International Application Number:	
Confirmation Number:	2095
Title of Invention:	MOTION AND NOISE ARTIFACT DETECTION AND RECONSTRUCTION ALGORITHMS FOR PHOTOPLETHYSMOGRAM AND EQUIVALENT SIGNALS
First Named Inventor/Applicant Name:	Ki H. Chon
Customer Number:	116025
Filer:	Orlando Lopez
Filer Authorized By:	
Attorney Docket Number:	WPI-216
Receipt Date:	02-JUN-2020
Filing Date:	29-JAN-2016
Time Stamp:	16:45:18
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 150
RAM confirmation Number	E202062G48292654
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Certificate of Correction	wpi-216_REQCertofCorr2.pdf	1279053	no	10
			09338a66683d1b7d5a464ae69896ae1922e0126b		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30484	no	2
			c395872b9c79a9faed0194558c39e3a3a5a3b4f3		
Warnings:					
Information:					
Total Files Size (in bytes):			1309537		
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.					

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 10,653,362 B2
APPLICATION NO. : 15/010345
DATED : May 19, 2020
INVENTOR(S) : Ki H Chon et al.

Page 1 of 1

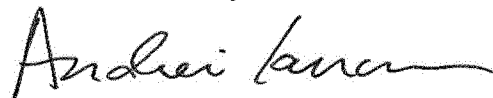
It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page

Item (73) should read:

Assignee: Worcester Polytechnic Institute
Worcester, MA

Signed and Sealed this
Thirtieth Day of June, 2020



Andrei Iancu
Director of the United States Patent and Trademark Office

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
---	---

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been
filed in the U.S. District Court Eastern District of Texas on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO. 2:23-cv-00141	DATE FILED 4/3/2023	U.S. DISTRICT COURT Eastern District of Texas
PLAINTIFF THE RESEARCH FOUNDATION FOR THE STATE UNIVERSITY OF NEW YORK, ET AL		DEFENDANT SAMSUNG ELECTRONICS CO., LTD., ET AL
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 8,417,326	4/9/2013	The Research Foundation for The State University of New York
2 8,718,753	5/6/2014	Worcester Polytechnic Institute
3 9,408,576	8/9/2016	Worcester Polytechnic Institute
4 9,713,428	7/25/2017	Plaintiff's
5 9,872,652	1/23/2018	Worcester Polytechnic Institute

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
-------	-------------------	------

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

Petitioner Ex-1004, 0493

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
---	---

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been
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☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO. Case No. 2:23-cv-141	DATE FILED 4/3/2023	U.S. DISTRICT COURT Eastern District of Texas
PLAINTIFF THE RESEARCH FOUNDATION FOR THE STATE UNIVERSITY OF NEW YORK, ET AL		DEFENDANT SAMSUNG ELECTRONICS CO., LTD., ET AL
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 9,986,921	6/5/2018	Worcester Polytechnic Institute
2 10,278,647	5/7/2019	University of Connecticut
3 10,285,601	5/14/2019	Worcester Polytechnic Institute
4 10,653,362	5/19/2020	Worcester Polytechnic Institute
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
-------	-------------------	------

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

Petitioner Ex-1004, 0494