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NOTICE OF ALLOWANCE AND FEE(S) DUE

183045 7590 01/31/2024
LS3 Discover
656 W. Randolph St.
Floor 5W
Chicago, IL 60661

EXAMINER	
STOLTENBERG, DAVID J	
ART UNIT	PAPER NUMBER
3685	

DATE MAILED: 01/31/2024

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/891,989	06/03/2020	Alexey Miroshnikov	Discover 20-0603-NP	4499

TITLE OF INVENTION: SYSTEM AND METHOD FOR MITIGATING BIAS IN CLASSIFICATION SCORES GENERATED BY MACHINE LEARNING MODELS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	04/30/2024

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 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted 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. 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 the USPTO patent electronic filing system.

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 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. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

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.

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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 the USPTO patent electronic filing system 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.
16/891,989	06/03/2020	Alexey Miroshnikov	Discover 20-0603-NP	4499

TITLE OF INVENTION: SYSTEM AND METHOD FOR MITIGATING BIAS IN CLASSIFICATION SCORES GENERATED BY MACHINE LEARNING MODELS

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nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	04/30/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
STOLTENBERG, DAVID J	3685	706-012000

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/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

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)

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

☐ Electronic Payment via the USPTO patent electronic filing system ☐ 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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16/891,989	06/03/2020	Alexey Miroshnikov	Discover 20-0603-NP	4499
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LS3 Discover 656 W. Randolph St. Floor 5W Chicago, IL 60661			STOLTENBERG, DAVID J	
			ART UNIT	PAPER NUMBER
			3685	
DATE MAILED: 01/31/2024				

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. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).

<https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf>

Routine uses of the information in this record may include disclosure to:

- 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
- 2) a federal, state, local, or international agency, in response to its request;
- 3) a contractor of the USPTO having need for the information in order to perform a contract;
- 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
- 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
- 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
- 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
- 8) 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));
- 9) the Office of Personnel Management (OPM) for personnel research purposes; and
- 10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 16/891,989	Applicant(s) Miroshnikov et al.	
	Examiner DAVID STOLTENBERG	Art Unit 3682	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 Communications received 31 October 2023.
☐ 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. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>09/13/2023</u> . 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material _____. 4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date. _____.	5. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 7. <input type="checkbox"/> Other _____.
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/DAVID J STOLTENBERG/
Primary Examiner, Art Unit 3682

Continuation of 3. The allowed claim(s) is/are: 1-6,8-10,13-17 and 20-25

DETAILED CORRESPONDENCE

Response to Amendment

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA. This Office action is in response to Amendments and Remarks filed on 31 October 2023 filed as a Request for Continuing Examination as a response to the Final Office Action issued 13 June 2023. Claims 7, 11, 12, 18 and 19 are cancelled. Claims 1-6, 8-10, 13-17, and 20-25 are pending and considered below

Claim Rejections - 35 USC § 103

Applicants arguments as presented with respect to the previous rejection of all pending claims under the combination of references Golding in view of Merrill, Yang, Jiang, and Farrar is persuasive and therefore the instant rejection of all pending claims under 35 USC 103 is withdrawn. Applicants presented persuasive arguments that the application of cited to prior art reference Merrill with respect to the independent claim limitation “mitigating bias in the trained machine learning model by producing a post-processed version of the trained machine learning model that comprises a respective transformation in place of each of the identified one or more input variable groups, wherein the post-processed version of the trained machine learning model is configured to (i) receive an input vector comprising respective values for a given set of input variables, (ii) for each of the identified one or more input variable groups, apply the respective transformation to the respective value for the input variable group, (iii) based on an evaluation of the transformed input vector, output a score for use in rendering the given type of classification decision,” is not supported by the combination of references to which the Examiner agrees. Further search and consideration has not identified prior art or a combination of prior art which discloses the claimed limitation and therefore the rejection is withdrawn.

Examiner's Amendment

An Examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee. The Examiner amendments are performed to correct minor typographical errors as part of Claim 1, Claim 5, Claim 6, and Claim 16. Applicants amended the claims at issue however did not properly indicate amendment status.

Claim 1: (Currently Amended) A method carried out by a computing system comprising one or more processors and at least one non-transitory computer-readable medium, the method comprising:

training [[-]] a machine learning model by carrying out a machine learning process on a training data set, wherein the trained machine learning model is configured to (i) receive an input vector comprising respective values for a given set of input variables and (ii) based on an evaluation of the received input vector, output a score for use in rendering a given type of classification decision;

detecting bias in the trained machine learning model relative to a protected class by (i) inputting a first set of input vectors associated with an unprotected class into the trained machine learning model and thereby producing a first set of scores associated with the unprotected class (ii) inputting a second set of input vectors associated with the protected class into the trained machine learning model and thereby producing a second set of scores associated with the protected class, (iii) performing a comparison between the first set of scores and the second set of scores, (iv) based on the comparison, determining that the trained machine learning model exhibits a threshold level of bias;

in response to determining that the trained machine learning model exhibits a threshold level of bias, identifying one or more input variable groups that contribute to the bias by (i) dividing the trained machine learning model's given set of input variables into a plurality of input

variable groups, wherein each respective input variable group includes a respective subset of the given set of input variables, (ii) determining respective bias contribution values for the plurality of input variable groups using a score explainer function, (iii) based on the respective bias contribution values that are determined for the plurality of input variable groups, identifying the one or more input variable groups that contribute to the bias;

mitigating bias in the trained machine learning model by producing a post-processed version of the trained machine learning model that comprises a respective transformation in place of each of the identified one or more input variable groups, wherein the post-processed version of the trained machine learning model is configured to (i) receive an input vector comprising respective values for a given set of input variables, (ii) for each of the identified one or more input variable groups, apply the respective transformation to the respective value for the input variable group, (iii) based on an evaluation of the transformed input vector, output a score for use in rendering the given type of classification decision; and

using the post-processed version of the trained machine learning model to render the given type of classification decision for a given input vector by (i) executing the post-processed version of the trained machine learning model, (ii) while executing the post-processed version of the trained machine learning model, inputting the given input vector into the post-processed version of the trained machine learning model and thereby causing the post-processed version of the trained machine learning model to output a given score for the given input vector, and (iii) comparing the given score to a classification threshold for the given type of classification decision.

Claim 5: (Currently Amended) The method of claim 1, wherein the respective bias contribution values for the plurality of input variable groups are based on ~~[[a]]~~ group partial dependence plot (PDP) metrics.

Claim 6: (Currently Amended) The method of claim 1, wherein the respective bias contribution values for the plurality of input variable groups are based on [[a]] Shapley Additive Explanation (SHAP) metrics.

Claim 16: (Currently Amended) The computing system of claim 13, wherein the respective bias contribution values for the plurality of input variable groups are based on [[a]] group partial dependence plot (PDP) metrics.

Reasons for Allowance

Claims 1-6, 8-10, 13-17, and 20-25 are allowed.

The following is the Examiner's statement of reasons for allowance:

The closest art of record, the combination of Golding (20200302309) in view of Merrill (20190378210), Yang (20210241033), Jiang et al., *Wasserstein Fair Classification*, and Farrar (20200081865) discloses an apparatus, method and computer readable medium to accomplish the determination of machine learning model bias with respect to a range of elements including protected and unprotected classifications of demographic characteristics including group bias contribution values and the determination of bias level scores as well as group related variables.

training a machine learning model by carrying out a machine learning process on a training data set, wherein the trained machine learning model is configured to (i) receive an input vector comprising respective values for a given set of input variables and (ii) based on an evaluation of the received input vector, output a score for use in rendering a given type of classification decision;

detecting bias in the trained machine learning model relative to a protected class by (i) inputting a first set of input vectors associated with an unprotected class into the trained machine learning model and thereby producing a first set of scores associated with the

unprotected class (ii) inputting a second set of input vectors associated with the protected class into the trained machine learning model and thereby producing a second set of scores associated with the protected class, (iii) performing a comparison between the first set of scores and the second set of scores, (iv) based on the comparison, determining that the trained machine learning model exhibits a threshold level of bias;

in response to determining that the trained machine learning model exhibits a threshold level of bias, identifying one or more input variable groups that contribute to the bias by (i) dividing the trained machine learning model's given set of input variables into a plurality of input variable groups, wherein each respective input variable group includes a respective subset of the given set of input variables, (ii) determining respective bias contribution values for the plurality of input variable groups using a score explainer function, (iii) based on the respective bias contribution values that are determined for the plurality of input variable groups, identifying the one or more input variable groups that contribute to the bias;

using the post-processed version of the trained machine learning model to render the given type of classification decision for a given input vector by (i) executing the post-processed version of the trained machine learning model, (ii) while executing the post-processed version of the trained machine learning model, inputting the given input vector into the post-processed version of the trained machine learning model and thereby causing the post-processed version of the trained machine learning model to output a given score for the given input vector, and (iii) comparing the given score to a classification threshold for the given type of classification decision.

However, the combination of Golding in view of Merrill, Yang, Jiang, and Farrar does not teach at least:

mitigating bias in the trained machine learning model by producing a post-processed version of the trained machine learning model that comprises a respective transformation in

place of each of the identified one or more input variable groups, wherein the post-processed version of the trained machine learning model is configured to (i) receive an input vector comprising respective values for a given set of input variables, (ii) for each of the identified one or more input variable groups, apply the respective transformation to the respective value for the input variable group, (iii) based on an evaluation of the transformed input vector, output a score for use in rendering the given type of classification decision.

Moreover, the missing claimed elements from the combination of Golding in view of Merrill, Yang, Jiang, and Farrar are not found in a reasonable number of references. Yet even if the missing claimed elements were found in a reasonable number of references, a person of ordinary skill in the art at the time the invention was made would not have been motivated to include these missing elements in the combination of Golding in view of Merrill, Yang, Jiang, and Farrar because a person of ordinary skill in the art at the time of Applicant's invention would not find a motivation for the combination.

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

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Stoltenberg whose telephone number is (571) 270-3472.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please see attached References Cited form 892.

See Lohia et al. (20210158102) for disclosures related to the determination of data related to bias as present during the training and execution of protected attributes by removing protected attributes prior to training and determining subsequent correlations. See at least paras. [28]-[51].

See Nadler et al. (20200410129) for disclosures related to the determination of data bias introduced by governance and regulations and determining methods to mitigate the detected bias in the system. See at least paras. [40]-[82].

See Dey et al. (20200311486) for disclosures related to employing a bias checker with respect to enacting the determination of bias within a dataset and a model including presenting bias level communications to system users. See at least paras. [22]-[41].

See Zavesky et al. (20190188605) for disclosures related to employing machine learning as a service to detect bias as it exists within a machine learning model. See at least paras. [25]-[35].

See Martineau et al. (20140229415) for disclosures related to the calculation of feature weights of class related features and comparing the feature weight with respect to bias thresholds to enhance model accuracy. See at least paras [81]-[116].

See *BIAS MITIGATION POST-PROCESSING FOR INDIVIDUAL AND GROUP FAIRNESS*, Lohia et al., 978-1-5386-4658-8/18/\$31.00 ©2019 IEEE for disclosures related to implementing group fairness and individual fairness with respect to mitigating and detecting bias.

See AI Fairness 360: An extensible toolkit for detecting and mitigating algorithmic bias, Bellamy et al., IBM J. RES. & DEV. VOL. 63 NO. 4/5 PAPER 4 JULY/SEPTEMBER 2019, for disclosures related to the implementation of AI Fairness 360 (AIF360),¹ an extensible open-source toolkit for detecting, understanding, and mitigating algorithmic biases.

The examiner can normally be reached on Monday-Friday 8:30AM to 5:00PM EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Waseem Ashraf, can be reached on (571) 270-3948. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300, or the examiner's direct fax phone number is 571 270 4472.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application 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 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.

/DAVID J STOLTENBERG/
Primary Examiner, Art Unit 3682