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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
16/441,521	06/14/2019	Athanasios Katsamanis	30226-002001	7627

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EXAMINER	
KOTULAK, NICOLE A	

ART UNIT	PAPER NUMBER
2659	

NOTIFICATION DATE	DELIVERY MODE
10/29/2020	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):

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Office Action Summary	Application No. 16/441,521	Applicant(s) Katsamanis et al.	
	Examiner NICOLE A KOTULAK	Art Unit 2659	AIA (FITF) Status Yes

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

Period for Reply

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

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

Status

1)☑ Responsive to communication(s) filed on 08/25/2020.

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

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

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

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

Disposition of Claims*

5) ☑ Claim(s) 1-14 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-14 is/are rejected.

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

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

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

Application Papers

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

11)☑ The drawing(s) filed on 08/25/2020 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

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

4) ☐ Other: _____.

DETAILED ACTION

1. This communication is in response to the Amendments and Arguments filed on 08/25/2020.

2. Claims 1-14 are pending and have been examined.

3. All previous objections/rejections not mentioned in this Office Action have been withdrawn by the examiner.

Notice of Pre-AIA or AIA Status

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

Response to Arguments

5. The Applicant's arguments have been considered, but they are moot in view of new grounds for rejection. More specifically, the limitations directed towards the use of neural networks to generate feature vectors and a recommendation. Please see the new mappings with respect to these limitations.

Claim Rejections - 35 USC § 103

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

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

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

8. Claim(s) 1-14 is/are rejected under 35 U.S.C. 103 as being unpatentable over Raanani et al. (U.S. PG Pub No. 2018/0077286), hereinafter Raanani, in view of Diriye et al. (U.S. PG Pub No. 2019/0327361), hereinafter Diriye.

Regarding claims 1, 13, and 14, Raanani teaches

(claim 1) **A method for aiding a multi-party interaction comprising** ([0062:1-5] a process, i.e. method, for analyzing conversations between participants)**:**

(claim 13) **A non-transitory machine-readable medium comprising instructions stored thereon, the instructions when executed by a data processing system cause said system to perform steps comprising** (Fig. 11, [0124] The instructions are stored in a memory 1110, i.e. non-transitory machine-readable medium comprising instructions stored thereon, can be implemented to program a processor 1105 to carry out the actions, i.e. instructions when executed by a data processing system cause said system to perform steps)**:**

(claim 14) **A system for aiding a multi-party interaction, the system comprising** (Fig. 11, [0122] A computer system)**:**

an input for acquiring signals corresponding to successive communication events between multiple parties (Figs. 1 and 11, [0017:1-7],

[0025:7-11], [0122] Input/output devices 1125, i.e. an input for acquiring signals, are included in the system, where an analysis component takes input from conversations between a calling party and a called party, i.e. successive communication events between multiple parties);

a data processor configured to process the signals to generate a recommendation by (Fig. 11, [0026:1-9], [0122] One or more central processing units 1105 are included in the system, that processes on-call behavior, i.e. signals, to generate on-call guidance, i.e. generate a recommendation):

acquiring signals corresponding to successive communication events between multiple parties (Fig. 1, [0017:1-7], [0025:7-11] an analysis component takes input, i.e. acquiring signals, from conversations between a calling party and a called party, i.e. successive communication events between multiple parties);

processing the signals to generate a recommendation by ([0022], [0026:1-9] analysis of the input, i.e. processing the signals, is used to generate on-call guidance, i.e. generate a recommendation):

processing, with one or more neural networks, one or more of the successive communication events to produce one or more respective feature vectors forming a sequence of feature vectors, the one or more respective feature vectors including at least one behavioral profile indicator ([0032], [0037:1-3, 14-16], [0038:1-3], [0056] a machine learning algorithm such as a DNN, i.e. one or more neural networks, is used to generate classifiers for different time windows of conversations, i.e. processing…one or more of the successive communication events,

where the classifiers include a set of features, i.e. one or more respective feature vectors, and where each of the generated classifiers, i.e. sequence of feature vectors, may include behavioral information such as laughter or rapport building, i.e. one or more respective feature vectors including at least one behavioral profile indicator)**; and**

processing the sequence of feature vectors…to generate the recommendation for presenting to at least one of the parties in the interaction ([0026] the classifier information is used by the real-time analysis component, i.e. processing the sequence of feature vectors, to generate on-call guidance, i.e. recommendation, which can provide instructions for a representative to change on-call behavior, i.e. for presenting to at least one of the parties in the interaction)**; and**

presenting the recommendation to the at least one of the parties ([0028:5-12] on-call guidance, i.e. the recommendation, may be presented on-screen or via another interface to the representative and/or the manager, i.e. presented to at least one of the parties)**; and**

(claim 14) **an output for presenting the recommendation to the at least one of the parties** (Fig. 11, [0122] input/output devices 1125, i.e. an output for presenting the recommendation, are included in the system)**.**

While Raanani provides the use of a neural network to generate classifiers, and the analysis of classifiers to generate on-call guidance, Raanani does not specifically teach the use of a second neural network to generate on-call guidance, and thus does not teach

with a second neural network.

Diriye, however, teaches **with a second neural network** ([0045], [0048:10-29], [0054:1-12], [0055] the user's cognitive state, i.e. feature vectors, is determined using interaction information and user behavior and mood features, i.e. processing…communication events, analyzed by a neural network, i.e. a one or more neural networks, and the user's cognitive state is input to the self-learning system including a neural network, i.e. a second neural network, to determine suggested activities, i.e. recommendations, which are presented to the user).

Raanani and Diriye are analogous art because they are from a similar field of endeavor in improving user satisfaction during customer service calls. Thus, it would have been obvious to one of ordinary skill in the art, before the effective filing date of the claimed invention, to modify the use of a single neural network to classify behavior for the generation of recommendation teachings of Raanani with the use of an additional neural network for the generation of the suggested activity as taught by Diriye. The motivation to do so would have been to achieve a predictable result of keeping the customer engaged and mood variations under control while waiting for assistance (Diriye [0054:12-16]).

Regarding claim 2, Raanani in view of Diriye teaches claim 1, and Raanani further teaches

wherein the successive communication events comprise conversational turns in a dialog between the multiple parties ([0025:7-11] A conversation, i.e. successive communication events, can be ongoing, i.e. conversational turns in a dialog,

between a customer and a representative, i.e. between multiple parties, to be used by the real-time analysis component).

Regarding claim 3, Raanani in view of Diriye teaches claim 1, and Raanani further teaches

wherein the successive communication events comprise separate dialogs between the multiple parties ([0035:5-11] historical call data, i.e. separate dialogs, for conversations, i.e. successive communication events, between participants, i.e. the multiple parties, may be used as input).

Regarding claim 4, Raanani in view of Diriye teaches claim 1, and Raanani further teaches

wherein the successive communication events comprise linguistic communication events comprising spoken or textual communication ([0018] conversations, i.e. successive communication events, can be in the form of any voice, video, email, or transcripts, i.e. linguistic communication events comprising spoken or textual communication).

Regarding claim 5, Raanani in view of Diriye teaches claim 4, and Raanani further teaches

wherein processing the signals includes performing automated speech recognition of the signals ([0022] automatic speech recognition (ASR) is one

component used to extract features, i.e. processing, of an input conversation, i.e. signals).

Regarding claim 6, Raanani in view of Diriye teaches claim 4, and Raanani further teaches

wherein processing the signal includes semantic analysis of linguistic content of the signals ([0022] natural language processing (NLP) is one component used to extract features, i.e. processing, by extracting semantic information, i.e. semantic analysis of linguistic content, of the input conversation, i.e. signals).

Regarding claim 7, Raanani in view of Diriye teaches claim 1, and Raanani further teaches

wherein the signals corresponding to successive communication events represent non-verbal behavioral features ([0045:10-16] metalinguistic features such as laughter, hesitation, and gasping, i.e. non-verbal behavioral features, can be extracted from the input conversation, i.e. signals corresponding to successive communication events).

Regarding claim 8, Raanani in view of Diriye teaches claim 7, and Raanani further teaches

wherein processing the signals includes performing a direct conversion of a speech signal without explicit recognition of words spoken ([0045] features produced, i.e. processing, may include metalinguistic features such as laughter,

hesitation, and gasping, which can be extracted, i.e. generated, from the input conversation, i.e. signals, despite no words being present, i.e. without explicit recognition of words spoken).

Regarding claim 9, Raanani in view of Diriye teaches claim 1, and Raanani further teaches

wherein processing the signals comprises processing the signals using a first machine-learning component to generate the profile indicators ([0036:1-5] a feature generating component 111, generates features by analyzing call data, i.e. processing signals, using artificial intelligence (AI) or machine learning (ML), i.e. a first machine-learning component to generate the profile indicators).

Regarding claim 10, Raanani in view of Diriye teaches claim 9, and Diriye further teaches

wherein processing signals to generate a recommendation comprises processing the profile indicators using a second machine-learning component ([0045], [0054:1-12], [0055] classification of the user's cognitive state from real-time interactions, i.e. processing signals, is determined using a neural network, i.e. a one or more neural networks, and suggested activities, i.e. recommendations, are presented to the user based on the classification inputs to the self-learning system including a neural network, i.e. a second machine-learning component).

Regarding claim 11, Raanani in view of Diriye teaches claim 1, and Raanani further teaches

wherein the generating of the recommendation is ongoing during an interaction based on events in the interaction that have occurred ([0027, 0038] on-call guidance can change as the call progresses, i.e. generating of the recommendation is ongoing during an interaction, using classifiers that are updated based on conversation features such as laughter or spoken key-phrases, i.e. based on events in the interaction that have occurred).

Regarding claim 12, Raanani in view of Diriye teaches claim 1, and Raanani further teaches

wherein the recommendation includes an indicator related to success of a goal for the interaction ([0028] on-call guidance, i.e. recommendation, can include real-time probabilities of various outcomes can be produced, i.e. indicator related to success of a goal for the interaction).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE A KOTULAK whose telephone number is (571)270-1474. The examiner can normally be reached on 8:00 - 5:00 M-F.

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, Pierre-Louis Desir can be reached on (571) 272-7799. 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 https://ppair-my.uspto.gov/pair/PrivatePair. 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.

/NICOLE A KOTULAK/
Examiner, Art Unit 2659

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