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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/839,093	08/16/2024	Xueheng QIU	P00135USX (G39.083)	3139

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EXAMINER
GOMEZ, CHRISTOPHER ALBERT

ART UNIT	PAPER NUMBER
3628	

NOTIFICATION DATE	DELIVERY MODE
08/21/2025	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. 18/839,093	Applicant(s) QIU et al.	
	Examiner CHRIS GOMEZ	Art Unit 3628	AIA (First Inventor to File) Status Yes

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

Period for Reply

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

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

Status

1)☑ Responsive to communication(s) filed on 22 July 2025.

☐ 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) 1-3,5-8,10,12-18 and 20 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) 1-3,5-8,10,12-18 and 20 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 _____ 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

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.

Status of Claims

2. This action is in reply to the application 18/839,093 filed on 8/16/2024. Claims 1, 3, 12, 18, and 20 were amended and claims 4, 9, 11, and 19 were cancelled in the reply filed 7/22/2025. Claims 1-3, 5-8, 10, 12-18, and 20 are pending. This action is final.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-3, 5-8, 10, 12-18, and 20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to an abstract idea without significantly more.

5. **Step 1:** Claims 1, 18, and 20 recite a method, a server, and a non-transitory computer-readable medium for performing: *A method for forecasting a delivery fare and determining a batching possibility prediction-based dynamic discount for a scheduled order of a goods delivery service, the method comprising: predicting, by a computer, a delivery fare for a scheduled delivery in an available time slot using a trained artificial neural network (ANN), wherein the trained ANN is a trained quantile regression neural network that comprises a multiple hidden layer feedforward neural network that is trained with historical data and a quantile loss; predicting, by a computer, a batching rate for the scheduled delivery to be batched with at least one other order in the*

available time slot using a neural network with long short-term memory (LSTM) layers that is trained on a set of historical delivery data; determining, by a computer, a discount for the scheduled delivery in the available time slot, based on the predicted batching rate using a S-shaped sigmoid function having the predicted batching rate as an input and the discount as an output; determining a final delivery fare for the scheduled delivery in the available time slot, based on the predicted delivery fare and the determined discount; causing the determined final delivery fare to be displayed for user selection of the scheduled delivery on a client device; receiving a user selection of the scheduled delivery fare; and identifying a delivery vehicle and assigning the scheduled delivery to the delivery vehicle. Therefore, claims 1, 18, and 20 are each directed to one of the four statutory categories of invention: a method, a system, and an article of manufacture, respectively.

Step 2A – Prong One: The claim limitations *[a] method for forecasting a delivery fare and determining a batching possibility prediction-based dynamic discount for a scheduled order of a goods delivery service, the method comprising: predicting ... a delivery fare for a scheduled delivery in an available time slot ... predicting ... a batching rate for the scheduled delivery to be batched with at least one other order in the available time slot ... determining ... a discount for the scheduled delivery in the available time slot, based on the predicted batching rate using a S-shaped sigmoid function having the predicted batching rate as an input and the discount as an output; determining a final delivery fare for the scheduled delivery in the available time slot, based on the predicted delivery fare and the determined discount; causing the determined final delivery fare to be displayed for user selection of the scheduled delivery ... receiving a user selection of the scheduled delivery fare; and identifying a delivery vehicle and assigning the scheduled delivery to the delivery vehicle,* as drafted, is a method that, under its broadest reasonable interpretation, only covers concepts which may be categorized as "Certain Methods of Organizing Human

Activity" (e.g., commercial interaction – business relations; fundamental economic practices (e.g., shipping/logistics)) and "Mathematical Concepts" (e.g., mathematical relationships). That is, nothing in the claim discloses anything outside the grouping of "Certain Methods of Organizing Human Activity" (e.g., commercial interaction – business relations; fundamental economic practices (e.g., shipping/logistics)) and "Mathematical Concepts" (e.g., mathematical relationships). Accordingly, the claim recites an abstract idea.

Step 2A – Prong Two: The judicial exception is not integrated into a practical application. The claims as a whole merely describes how to generally "apply" the concept of the aforementioned abstract idea using *a computer* (claim 1), *a server* (claim 18), *one or more processors* (claim 20), *a non-transitory computer-readable medium* (claim 20), and *a client device* (claims 1, 18, and 20). The claimed components are recited at a high level of generality and are merely invoked as generic computer components to perform the aforementioned abstract idea. Simply implementing the abstract idea on a generic computerized system is not a practical application of the abstract idea. Furthermore, claims 1, 18, and 20 recite the limitations *a trained artificial neural network (ANN)* (claims 1, 18, and 20), *a trained quantile regression neural network* (claims 1, 18, and 20), *a multiple hidden layer feedforward neural network that is trained with historical data and a quantile loss* (claims 1, 18, and 20), and *a neural network with long short-term memory (LSTM) layers that is trained on a set of historical delivery data* (claims 1, 18, and 20). These limitations do not integrate the abstract idea into a practical application. In support of this position, Examiner cites the USPTO's July 2024 Subject Matter Eligibility Examples. Specifically, Examiner argues that the aforementioned limitations of claims 1, 18, and 20 are analogous to the artificial neural network (ANN) described in Example 47 Claim 2. The USPTO's analysis examines the mere use of the ANN in the following way: "The limitations in (d) and (e) reciting 'using the trained ANN' provide nothing more than mere instructions to implement an

abstract idea on a generic computer. See MPEP 2106.05(f)." Similarly, the instant claims recite *a computer*, *server*, or *one or more processors* used to perform the functions of *a trained artificial neural network (ANN)* (claims 1, 18, and 20), *a trained quantile regression neural network* (claims 1, 18, and 20), *a multiple hidden layer feedforward neural network that is trained with historical data and a quantile loss* (claims 1, 18, and 20), and *a neural network with long short-term memory (LSTM) layers that is trained on a set of historical delivery data* (claims 1, 18, and 20). These limitations describe no more than the mere use of algorithms, and they are therefore analogous to Example 47 Claim 2 limitations (d) and (e). In other words, merely using a trained neural network or similar computer algorithm provides nothing more than mere instructions to implement the abstract idea on a generic computer (i.e., *a computer*, *server*, or *one or more processors*). See MPEP 2106.05(f). MPEP 2106.05(f) provides the following considerations for determining whether a claim simply recites a judicial exception with the words "apply it" (or an equivalent), such as mere instructions to implement an abstract idea on a computer: (1) whether the claim recites only the idea of a solution or outcome i.e., the claim fails to recite details of how a solution to a problem is accomplished; (2) whether the claim invokes computers or other machinery merely as a tool to perform an existing process; and (3) the particularity or generality of the application of the judicial exception. The trained neural network or similar computer algorithm is used to generally apply the abstract idea without placing any limits on how the trained neural network or similar computer algorithm functions. Rather, these limitations only recite the outcome of "predicting ... a delivery fare for a scheduled delivery in an available time slot," or "predicting ... a batching rate for the scheduled delivery to be batched with at least one other order in the available time slot," for example, and do not include any details about how the "predicting" is accomplished. See MPEP 2106.05(f). Accordingly, the aforementioned additional

elements do not integrate the abstract idea into a practical application. The claim is directed to an abstract idea.

Step 2B: The claims do not include additional elements that are sufficient to amount to significantly more than the judicial exception. As discussed above, the claims as a whole merely describe how to generally "apply" the aforementioned abstract idea using generic computer components. The additional elements *a server* (described in spec. para. [0043]), *one or more processors* (described in spec. para. [0093]), and *a computer-readable medium* (described in spec. para. [0025]) are recited at a high level of generality and are merely invoked as a tool to perform the aforementioned abstract idea. As explained with respect to Step 2A, Prong Two, the additional elements of "using" *a trained artificial neural network (ANN)* (described in spec. para. [0009]), *a trained quantile regression neural network* (described in spec. para. [0009]), *a multiple hidden layer feedforward neural network that is trained with historical data and a quantile loss* (described in spec. para. [0009]), and *a neural network with long short-term memory (LSTM) layers that is trained on a set of historical delivery data* (described in spec. para. [0059]) are at best mere instructions to "apply" the abstract ideas, which cannot provide an inventive concept. See MPEP § 2106.05(f). The additional elements are described at a high-level indicating the known nature of each of these additional elements in the art. Simply implementing the abstract idea on a generic computerized system does not amount to significantly more than the judicial exception. Thus, even when viewed as a whole, nothing in the claims add significantly more to the abstract idea. Therefore the claims are not patent eligible.

6. Claims 2-3, 5-8, 10, and 12-17 have been given the full two part analysis including analyzing the limitations both individually and in combination. Claims 2-3, 5-8, 10, and 12-17 when analyzed individually, and in combination, are also held to be patent ineligible under 35 U.S.C. 101. The recited limitations of the dependent claims fail to establish that the claims do not recite an

abstract idea because the recited limitations of the dependent claims merely further narrow the abstract idea.

Step 2A – Prong Two: The limitations of the dependent claims fail to integrate an abstract idea into a practical application because the claims as a whole merely describe how to generally "apply" the aforementioned abstract idea. Specifically, the claims as a whole merely describes how to generally "apply" the concept of the aforementioned abstract idea using *a display* (claim 17). The claimed components are recited at a high level of generality and are merely invoked as generic computer components to perform the aforementioned abstract idea. Simply implementing the abstract idea on a generic computerized system is not a practical application of the abstract idea. Furthermore, claim 3 recites the limitations *quantile regression network, linear regression network, lasso regression network, support vector regression network, a multilayer perceptron neural network, a long short-term memory neural network,* and *a decision tree-based algorithm*. These limitations do not integrate the abstract idea into a practical application. In support of this position, Examiner cites the USPTO's July 2024 Subject Matter Eligibility Examples. Specifically, Examiner argues that the aforementioned additional elements of claims 3 are analogous to the artificial neural network (ANN) described in Example 47 Claim 2. The USPTO's analysis examines the mere use of the ANN in the following way: "The limitations in (d) and (e) reciting 'using the trained ANN' provide nothing more than mere instructions to implement an abstract idea on a generic computer. See MPEP 2106.05(f)." Similarly, the instant claims recite *a computer* used to perform the functions of *quantile regression network, linear regression network, lasso regression network, support vector regression network, a multilayer perceptron neural network, a long short-term memory neural network,* and *a decision tree-based algorithm.* These limitations describe no more than the mere use of algorithms, and they are therefore analogous to Example 47 Claim 2 limitations (d) and (e). In other words, merely using a trained

neural network or similar computer algorithm provides nothing more than mere instructions to implement the abstract idea on a generic computer (i.e., *a computer*). See MPEP 2106.05(f). MPEP 2106.05(f) provides the following considerations for determining whether a claim simply recites a judicial exception with the words "apply it" (or an equivalent), such as mere instructions to implement an abstract idea on a computer: (1) whether the claim recites only the idea of a solution or outcome i.e., the claim fails to recite details of how a solution to a problem is accomplished; (2) whether the claim invokes computers or other machinery merely as a tool to perform an existing process; and (3) the particularity or generality of the application of the judicial exception. The trained neural network or similar computer algorithm is used to generally apply the abstract idea without placing any limits on how the trained neural network or similar computer algorithm functions. Rather, these limitations only recite the outcome of "predicting ... a delivery fare for a scheduled delivery in an available time slot," and do not include any details about how the "predicting" is accomplished. See MPEP 2106.05(f). Accordingly, the aforementioned additional elements do not integrate the abstract idea into a practical application. The claim is directed to an abstract idea.

Step 2B: The claim does not include additional elements that are sufficient to amount to significantly more than the judicial exception. The additional elements of *a display* (described in spec. para. [0081]) are described in the specification at a high-level indicating the known nature of each of these additional elements in the art. As explained with respect to Step 2A, Prong Two, the additional elements of "using" *quantile regression network* (described in spec. para. [0056]), *linear regression network* (described in spec. para. [0056]), *lasso regression network* (described in spec. para. [0056]), *support vector regression network* (described in spec. para. [0056]), *a multilayer perceptron neural network* (described in spec. para. [0056]), *a long short-term memory neural network* (described in spec. para. [0059]), and *a decision tree-based algorithm* (described

in spec. para. [0056]) are at best mere instructions to "apply" the abstract ideas, which cannot provide an inventive concept. See MPEP § 2106.05(f). The additional elements are described at a high-level indicating the known nature of each of these additional elements in the art. Simply implementing the abstract idea on a generic computerized system does not amount to significantly more than the judicial exception. Thus, even when viewed as a whole, nothing in the claims add significantly more to the abstract idea. Therefore the claims are not patent eligible.

Reasons for Novelty

7. Claims 1-3, 5-8, 10, 12-18, and 20 are novel over the prior art. Specifically, claims 1-3, 5-8, 10, 12-18, and 20 are not anticipated by the prior art and they are also non-obvious over the prior art. Although independent claims 1 and 18-20 were previously rejected as being obvious over Kumar in view of Sahay, the amendments to these independent claims render them non-obvious. Other relevant art of note includes: Mishra (U.S. Pub. No. 2022/0253801) – Piece versus multi-piece carrier optimization; Lye (U.S. Pub. No. 2021/0082074) – Allocation of dynamically batched service providers and service requesters; and Loppatto (U.S. Pub. No. 2015/0363843) – Dynamic provisioning of pick-up, delivery, transportation and/or sortation options. In particular, the inventive combination of, "a trained artificial neural network (ANN), wherein the trained ANN is a trained quantile regression neural network that comprises a multiple hidden layer feedforward neural network that is trained with historical data and a quantile loss," "a neural network with long short-term memory (LSTM) layers that is trained on a set of historical delivery data," and "using a S-shaped sigmoid function having the predicted batching rate as an input and the discount as an output," in the field of batching and scheduling deliveries would not have been obvious to one of ordinary skill in the art before the time of filing. Although particular amended claim elements are being highlighted by Examiner, it is the claim as a whole which Examiner has

determined is non-obvious over the prior art. Therefore, claims 1-3, 5-8, 10, 12-18, and 20 are novel over the prior art and are not subject to rejection under 35 USC § 102 or 35 USC § 103.

Conclusion

8. 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.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRIS GOMEZ whose telephone number is (571) 272-0926. The examiner can normally be reached on 7:30 AM – 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, SHANNON CAMPBELL can be reached at (571) 272-5587. 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).

/CHRISTOPHER GOMEZ/

Examiner, Art Unit 3628