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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/412,688	03/27/2009	Shuqing Zeng	P008237-RD-MJL	7551
65798	7590	01/11/2016	EXAMINER	
MILLER IP GROUP, PLC GENERAL MOTORS CORPORATION 42690 WOODWARD AVENUE SUITE 300 BLOOMFIELD HILLS, MI 48304			PAULS, JOHN A	
			ART UNIT	PAPER NUMBER
			3626	
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			01/11/2016	PAPER

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.

Office Action SummaryApplication No.
12/412,688Applicant(s)
ZENG, SHUQINGExaminer
JOHN PAULSArt Unit
3626AIA (First Inventor to File)
Status
No**-- 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).

Status1) Responsive to communication(s) filed on PTAB Decision on 25 September, 2015. 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) 1-20 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5a) Of the above claim(s) _____ is/are withdrawn from consideration.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) 1-20 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 Papers10) 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. § 11912) 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)3) Interview Summary (PTO-413)

Paper No(s)/Mail Date. _____.

2) Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date _____.4) Other: _____.

DETAILED ACTION

Status of the Claims

1. Claims 1 – 20 are pending in this application.
2. The Patent Trial and Appeal Board considered this application and issued their decision on 25 September, 2015. The Examiner was Reversed.
3. The present application is being examined under the pre-AIA first to invent provisions.

Transfer of Application

4. This application has been transferred within the Office as a result of Examiner Fuelling's re-assignment. Applicant is invited to contact the undersigned to schedule a telephonic interview to discuss and resolve the issues set forth in this Office Action.

Re-Open Prosecution after Patent Board Decision

5. A Patent Trial and Appeal Board decision was issued on 25 September, 2015, reversing Examiner's action on the claims. In response to this decision, prosecution is being reopened. The Technology Center (TC) Director has authorized the reopening of prosecution under 37 CFR 1.198 for the purpose of entering a new rejection, as indicated by signing below. See MPEP § 1002.02(c) and MPEP § 1214.04.

Claim Rejections - 35 USC § 101

6. 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.
7. Claims **1 – 20** are rejected under 35 U.S.C. 101 because the claimed invention is directed to a judicial exception (i.e. a law of nature, a natural phenomenon, or an abstract idea) without significantly more.

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8. The claims recite steps including **providing a GPS receiver that receives GPS signals and provides GPS measurement information, providing a processing unit that processes the GPS information including: estimating a latent state vector, calculating an observation prediction, providing a first difference signal between the observation prediction and the GPS measurement information, encoding the first difference signal using a state prediction model to generate a predicted latent state vector, providing a second difference signal between the estimated latent state vector and the predicted latent state vector and encoding the second difference signal to generate a second coded output.**
9. The claims are directed to an abstract idea because an abstract idea is recited in the claims. As an ordered combination of steps, the claims recite the abstract idea of **coding GPS measurements**. This concept is similar in scope to those found to be abstract ideas by the Courts. For example, the claims recite **a mathematical relationship or algorithm**.
10. Taken individually, the claims recite the following features:
 - **estimating a latent state vector**. The specification describes this function in paragraphs 0026 - 0039 (of the published specification (US PGPUB 2010/0250132 A1). The latent state vector (or state vector or latent vector) are estimated using an equation. This concept is similar in scope to those found to be abstract ideas by the Courts. For example, the claims recite **a mathematical relationship or algorithm**.
 - **calculating an observation prediction**. The specification describes this function in paragraphs 0113 (of the published specification (US PGPUB 2010/0250132 A1).

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The observation prediction is calculated using an equation. This concept is similar in scope to those found to be abstract ideas by the Courts. For example, the claims recite **a mathematical relationship or algorithm.**

- **providing a first difference signal between the observation prediction and the GPS measurement information.** The specification describes this function in paragraphs 0113 (of the published specification (US PGPUB 2010/0250132 A1)). The difference is calculated using an “adder”. This concept is similar in scope to those found to be abstract ideas by the Courts. For example, the claims recite **a mathematical relationship or algorithm.**
- **encoding the first difference signal using a state prediction model to generate a predicted latent state vector.** The specification describes this function in paragraphs 0113 (of the published specification (US PGPUB 2010/0250132 A1)). The encoding is disclosed as being performed by a Huffman encoder. This concept is similar in scope to those found to be abstract ideas by the Courts. For example, the claims recite **a mathematical relationship or algorithm** or alternately **an algorithm that converts one form of numerical representation to another.**

Examiner notes that Huffman encoders are old and well known. Encoding a signal using a Huffman encoder is well-understood routine and conventional.

- **providing a second difference signal between the estimated latent state vector and the predicted latent state vector.** The specification describes this function in paragraphs 0113 (of the published specification (US PGPUB 2010/0250132 A1)). The difference is calculated using an “adder”. This concept is similar in scope to

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those found to be abstract ideas by the Courts. For example, the claims recite a **mathematical relationship or algorithm**.

- **encoding the second difference signal to generate a second coded output.** The specification describes this function in paragraphs 0113 (of the published specification (US PG PUB 2010/0250132 A1). The encoding is disclosed as being performed by a Huffman encoder. This concept is similar in scope to those found to be abstract ideas by the Courts. For example, the claims recite a **mathematical relationship or algorithm** or alternately **an algorithm that converts one form of numerical representation to another**. Examiner notes that Huffman encoders are old and well known. Encoding a signal using a Huffman encoder is well-understood routine and conventional.
- Additional features recited by the claims include **providing a GPS receiver that receives GPS signals and provides GPS measurement information**. The specification describes the GPS receiver are being well-understood, routine and conventional. Additionally, the function of receiving GPS signals and providing GPS measurement information is well-understood, routine and conventional, and are performed in a purely conventional manner.
- Additional features recited by the claims include **providing a processing unit that processes the GPS information**. The processing unit is described in the specification at a high level of generality and may be reasonably construed to be a general purpose computer executing various algorithms disclosed in the specification.

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- Additional features recited by the claims include **a stand-alone position and velocity estimator, an observation prediction model, a first difference, a first (Huffman) encoder, a state prediction model, a second difference and a second (Huffman) encoder**. These features are disclosed in the specification as functions performed by the processing unit; therefore these features may be reasonably be construed as software per se.
- The dependent claims merely recite additional details about the format and type of information, and specific ways the calculations are performed

11. The claims do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the additional elements or combination of elements in the claims, other than the abstract idea per se, amount to no more than a recitation of A) generic computer structure that serves to perform generic computer functions and that serve to merely link the abstract idea to a particular technological environment (**i.e. a processing unit**); and B) functions that are well-understood, routine, and conventional activities previously known to the pertinent industry (**i.e. receiving GPS signals, providing GPS measurement information, performing calculations according to an algorithm**). Examiner notes that the processing unit is recited without any additional features. The processing unit may reasonably be construed as a generic computer. Each of the above components are disclosed as being purely conventional and known in the industry. Therefore, the claims are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter.

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Claim Rejections - 35 USC § 112

12. The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims **4, 6, 10-13, 18, and 19** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

- Claims **4 and 6** recite “the latent state vector” however, Examiner cannot determine whether this term refers to the predicted or estimated latent state vector recited in claim 1 (or whether it refers to a predicted vector at a first time or a second time). Further, the estimated latent state vector in Claim 1 is not “provided” or “estimated” it is “generated”. Appropriate correction is required.
- Claim **10** recites “provides the latent state vector”. Examiner cannot determine if this refers to the prediction of or the estimated vector. Additionally, the (estimated) latent state vector is not “provided” it is “generated”. Appropriate correction is required.
- Claim **12** recites “the latent state vector” however, Examiner cannot determine whether this term refers to the predicted or estimated latent state vector recited in claim 10 (or whether it refers to a predicted vector at a first time or a second time). Further, the estimated latent state vector in Claim 10 is not “provided” or “estimated” it is “generated”. Appropriate correction is required.
- Claims **18 and 19** recite “estimating a latent state vector” however, Examiner cannot determine whether this term refers to the same estimated latent state vector recited in

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claim 10. Appropriate correction is required.

CONCLUSION

Any inquiry of a general nature or relating to the status of this application or concerning this communication or earlier communications from the Examiner should be directed to **John A. Pauls** whose telephone number is **(571) 270-5557**. The Examiner can normally be reached on Monday to Friday 9:00 to 5:00 Eastern. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, **Fonya Long** can be reached at **(571) 270-5096**.

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://portal.uspto.gov/external/portal/pair>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866.217.9197**.

Official replies to this Office action may now be submitted electronically by registered users of the EFS-Web system. Information on EFS-Web tools is available on the Internet at: <http://www.uspto.gov/patents/process/file/efs/guidance/index.jsp>. An EFS-Web Quick-Start Guide is available at: <http://www.uspto.gov/ebc/portal/efs/quick-start.pdf>.

Alternatively, official replies to this Office action may still be submitted by any **one** of fax,

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mail, or hand delivery. **Faxed replies should be directed to the central fax at (571) 273-8300.**

Mailed replies should be addressed to “Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.” Hand delivered replies should be delivered to the “Customer Service Window, Randolph Building, 401 Dulany Street, Alexandria, VA 22314.”

/JOHN PAULS/

Primary Examiner, Art Unit 3626

/FONYA LONG/

Supervisory Patent Examiner, Art Unit 3626

/GREG VIDOVICH/

Director, Technology Center 3600

1/8/2016