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ePCT Office action
PCT Collaborative Search and Examination Pilot
Upload peer contribution

IA Number: CN2018095003
Applicant name: BAIDU.COM TIMES TECHNOLOGY (BEIJING)
CO., LTD. (+1)
International filing date: 09 July 2018

Main ISA: CN - State Intellectual Property Office of the
People's Republic of China
Main ISA provisional report
uploaded: 03 September 2018

Peer ISA: KR - Korean Intellectual Property Office
Peer contribution uploaded: 28 September 2018

The following document(*) has been uploaded by the peer ISA for consideration by the main ISA:

- Peer contribution (16 pages)

Indications by the peer ISA concerning the further searching performed:

- The peer review covered all claims covered by the main ISA
- The peer examiner conducted a full prior art search of the claims covered

() Document containing a maximum of three different documents put together with a cover letter as first page.*

Date: 28 September 2018 02:59:13 CEST
ePCT user: Jong Kyeong Moon
Authentication: OFFICE

Collaborative Search and Examination(CS&E) Peer Examiner Contribution Form	Application No. PCT/CN2018/095003	Applicant(s) BAIDU.COM TIMES TECHNOLOGY (BEIJING) CO., LTD.
	Examiner/Office SUNGCHEAL BYUN/KIPO	
Unity		
Do you share the view of the main examiner related to unity of invention?		
		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If you answered No above, list the number of groups of inventions?		1. 2. 3. 4.
Brief explanation as to non-unity:		
Classification of PCT application*		
*[Optional] If peer examiner hopes to change IPC of PCT application classified by main examiner or classify PCT application using national classification, please note.		
IPC:G05D 1/02(2006.01)i National Classification (identify scheme):		
Fields Searched		
Classified search (indicate classification symbols searched and any additional limitations: G05D 1/02; B60K 26/04; B60K 31/00; B60W 30/00; B60W 30/14; F02D 29/02; F02D 41/10; G05D 1/00; G07C 5/02; G09G 5/00		
Electronic databases consulted (include search terms or queries): eKOMPASS(KIPO internal) & WINTELIPS & Keywords: autonomous driving vehicle (ADV), command, speed, measurement, acceleration, feedback, calibration table, update, inertial measurement unit (IMU)		
Other documentation searched (include		

REFERENCES CONSIDERED RELEVANT			
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Cited in the provisional ISR	Relevant to Claim No.
Y	WO 2018-090289 A1 (BAIDU.COM TIMES TECHNOLOGY (BEIJING) CO., LTD. et al.) 24 May 2018 See paragraphs [0033], [0066]-[0067]; claims 1-2, 4; and figure 8.	No	1-21
Y	US 2005-0234629 A1 (TOSHIMITSU MARUKI) 20 October 2005 see paragraphs [0018], [0020]; claim 4; and figure 3.	No	1-21
Y	US 2011-0141136 A1 (CARDNO ANDREW JOHN et al.) 16 June 2011 See paragraphs [0313]-[0323].	No	7-9
A	US 2017-0355368 A1 (GM GLOBAL TECHNOLOGY OPERATIONS LLC) 14 December 2017 See paragraph [0019].	No	1-21
A	JP 2011-231658 A (HONDA MOTOR CO., LTD.) 17 November 2011 See paragraphs [0020]-[0023]; claim 1; and figure 4.	No	1-21
A	US 2017-0306874 A1 (FORD GLOBAL TECHNOLOGIES, LLC) 26 October 2017 See paragraph [0012]; claim 1; and figure 1.	No	1-21
* Category – X (the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone), Y (the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art), or A (document defining the general state of the art which is not considered to be of particular relevance)			
COMMENTS ON THE APPLICATION			

Do you share the view of the main examiner's opinion related to non-establishment? Yes, I do No, I don't
[Non-establishment of opinion] This international search report has not been established in respect of certain claims ;

Claims Nos. :

because the related to subject matter not required to be searched by this Authority,:

Claims Nos.:

because the related to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out:

Claims Nos.:

because they are dependent claims and are not drafted in accordance with the second and third sentence of Rule 6.4(a)

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial application :

Novelty (N)	Claims	<u>1-21</u>	YES
	Claims	<u>none</u>	NO
Inventive step (IS)	Claims	<u>none</u>	YES
	Claims	<u>1-21</u>	NO
Industrial applicability (IA)	Claims	<u>1-21</u>	YES
	Claims	<u>none</u>	NO

Certain defects in the international application:

Certain observations on the international application:

1. Claims 1, 12 and 17 are unclear in that the term 'the calibration table' has not been previously defined. Therefore, Claims 1, 12 and 17 do not meet the requirements of PCT Article 6.

2. Claim 9, dependent on claim 8, is worded in reference to 'the update point' of claim 8. However, claim 9 is unclear in that the term 'the update point' has not been defined in claim 8, but claim 4. Therefore, claim 9 does not meet the requirements of PCT Article 6.

others :



Annex C

Method of Establishment and Detailed Explanation of Each Item in Peer examiner contribution form

A peer examiner contribution form is not a new form, but is created by abstracting some items from a normal ISR and a WO-ISA.

[Unity] From Box 4 (International Search Report (ISR) and Written Opinion of an International Searching Authority (WO-ISA)) for unity of invention, items to be considered by a peer examiner are extracted. In other words, a peer examiner does not have to consider the following matters, i.e., issuance of a notice for an additional fee payment or additional fees paid by a patent applicant. Therefore, a peer examiner does simply have to establish the number of claimed inventions and the scope of claims of each invention category.

[Classification of a PCT application] A peer examiner can change the classification of the PCT international application classified by a main examiner: provided, however, that this should be an option, not a mandatory work, after taking into consideration workloads of the concerned office.

National classifications, such as CPC and F-term, other than the IPC can be stated.

[Search notes] A peer examiner can perform international search and state search-related classification, DB, keywords and a search date, with respect to patent applications participating in the pilot project. Further, he/she can perform additional searches of one's own volition by determining the scope of search, in other words, by deciding whether to do a full or focused search, after reviewing a provisional ISR and WO/ISA of a main authority.

[Reference considered relevant] This is to establish search results of a peer examiner and its format is the same with the previous ISR format: provided, however, that there should be any relevant marks of whether the closest prior art is cited by a main authority or not so as for a main authority to easily establish a final report.

[Comments on the application] These are the contents of box 3, 5, 7 and 8 of a written opinion.

A peer examiner can fill out the concerned box, as modeling in a normal ISR and establish his/her own opinions only when the contributions are different from the ones of a main authority.

PATENT COOPERATION TREATY
PCT

심사관	파트장	과장

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 18A52205	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/CN2018/095003	International filing date (<i>day/month/year</i>) 09 July 2018 (09.07.2018)
(Earliest) Priority Date (<i>day/month/year</i>)	
Applicant BAIDU.COM TIMES TECHNOLOGY (BEIJING) CO., LTD. et al.	

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- the international application in the language in which it was filed
- a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. **Certain claims were found unsearchable** (See Box No. II)

3. **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

- the text is approved as submitted by the applicant.
- the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- the text is approved as submitted by the applicant.
- the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 9

- as suggested by the applicant.
- as selected by this Authority, because the applicant failed to suggest a figure.
- as selected by this Authority, because this figure better characterizes the invention.

b. none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/095003

A. CLASSIFICATION OF SUBJECT MATTER
G05D 1/02(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 G05D 1/02; B60K 26/04; B60K 31/00; B60W 30/00; B60W 30/14; F02D 29/02; F02D 41/10; G05D 1/00; G07C 5/02; G09G 5/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 Korean utility models and applications for utility models
 Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 eKOMPASS(KIPO internal) & keywords: autonomous driving vehicle (ADV), command, speed, measurement, acceleration, feedback, calibration table, update, inertial measurement unit (IMU)


C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2018-090289 A1 (BAIDU.COM TIMES TECHNOLOGY (BEIJING) CO., LTD. et al.) 24 May 2018 See paragraphs [0033], [0066]-[0067]; claims 1-2, 4; and figure 8.	1-21
Y	US 2005-0234629 A1 (TOSHIMITSU MARUKI) 20 October 2005 see paragraphs [0018], [0020]; claim 4; and figure 3.	1-21
Y	US 2011-0141136 A1 (CARDNO ANDREW JOHN et al.) 16 June 2011 See paragraphs [0313]-[0323].	7-9
A	US 2017-0355368 A1 (GM GLOBAL TECHNOLOGY OPERATIONS LLC) 14 December 2017 See paragraph [0019].	1-21
A	JP 2011-231658 A (HONDA MOTOR CO., LTD.) 17 November 2011 See paragraphs [0020]-[0023]; claim 1; and figure 4.	1-21
A	US 2017-0306874 A1 (FORD GLOBAL TECHNOLOGIES, LLC) 26 October 2017 See paragraph [0012]; claim 1; and figure 1.	1-21

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/KR  International Application Division Korean Intellectual Property Office 189 Cheongsu-ro, Seo-gu, Daejeon, 35208, Republic of Korea Facsimile No. +82-42-481-8578	Authorized officer BYUN, Sung Cheal Telephone No. +82-42-481-8262
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/CN2018/095003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2018-090289 A1	24/05/2018	CN 108391429 A EP 3341254 A1 US 2018-0196440 A1	10/08/2018 04/07/2018 12/07/2018
US 2005-0234629 A1	20/10/2005	EP 1586885 A2 EP 1586885 A3 EP 1586885 B1 JP 04349187 B2 JP 2005-297872 A KR 10-0618335 B1 KR 10-2006-0045661 A US 7693641 B2	19/10/2005 11/11/2009 18/01/2012 21/10/2009 27/10/2005 30/08/2006 17/05/2006 06/04/2010
US 2011-0141136 A1	16/06/2011	AU 2012-101895 A4 AU 2012-231859 A1 AU 2013-101079 A4 US 2011-0169835 A1 US 2011-0179066 A1 US 2011-0179370 A1 US 2011-0181597 A1 US 2011-0184995 A1 US 2011-0261049 A1 US 2011-0294566 A1 US 2014-0043337 A1 US 2014-0089297 A1 US 2015-0084964 A1 US 2016-0267693 A1 US 2016-0307345 A1 US 2017-018102 A1 US 8866816 B2 US 9058695 B2 US 9349200 B2 US 9355482 B2 US 9418456 B2 US 9870629 B2 WO 2009-154478 A1 WO 2009-154479 A1 WO 2009-154480 A1 WO 2009-154480 A9 WO 2009-154481 A1 WO 2009-154482 A1 WO 2009-154483 A1 WO 2009-154484 A2 WO 2009-154484 A3 WO 2010-024697 A1 WO 2012-128651 A1	07/11/2013 17/10/2013 12/09/2013 14/07/2011 21/07/2011 21/07/2011 28/07/2011 28/07/2011 27/10/2011 01/12/2011 13/02/2014 27/03/2014 26/03/2015 15/09/2016 20/10/2016 19/01/2017 21/10/2014 16/06/2015 24/05/2016 31/05/2016 16/08/2016 16/01/2018 23/12/2009 23/12/2009 23/12/2009 23/12/2009 23/12/2009 23/12/2009 23/12/2009 23/12/2009 11/02/2010 04/03/2010 27/09/2012
US 2017-0355368 A1	14/12/2017	CN 107472246 A	15/12/2017

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/CN2018/095003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2011-231658 A	17/11/2011	JP 05523921 B2	18/06/2014
US 2017-0306874 A1	26/10/2017	None	

심사관	파트장	과장

PATENT COOPERATION TREATY

From the
 INTERNATIONAL SEARCHING AUTHORITY

PCT

**WRITTEN OPINION OF THE
 INTERNATIONAL SEARCHING AUTHORITY**

(PCT Rule 43bis.1)

To:
 INSIGHT INTELLECTUAL PROPERTY LIMITED
 19 A, Tower A, InDo Building No. 48A Zhichun Road,
 Haidian District Beijing 100098 China

Date of mailing
 (day/month/year)

Applicant's or agent's file reference
 18A52205

FOR FURTHER ACTION
 See paragraph 2 below

International application No.
PCT/CN2018/095003

International filing date (day/month/year)
09 July 2018 (09.07.2018)

Priority date(day/month/year)

International Patent Classification (IPC) or both national classification and IPC
G05D 1/02(2006.01)i

Applicant
BAIDU.COM TIMES TECHNOLOGY (BEIJING) CO., LTD. et al.

1. This opinion contains indications relating to the following items:
- Box No. I Basis of the opinion
 - Box No. II Priority
 - Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - Box No. IV Lack of unity of invention
 - Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
 - Box No. VI Certain documents cited
 - Box No. VII Certain defects in the international application
 - Box No. VIII Certain observations on the international application
2. **FURTHER ACTION**
 If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 bis(b) that written opinions of this International Searching Authority will not be so considered.
- If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
 For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR
 International Application Division
 Korean Intellectual Property Office
 189 Cheongsa-ro, Seo-gu, Daejeon,
 35208, Republic of Korea
 Facsimile No. +82-42-481-8578

Date of completion of this opinion

Authorized officer
 BYUN, Sung Cheal
 Telephone No. +82-42-481-8262

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/CN2018/095003

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of :

- the international application in the language in which it was filed
- a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

- a. forming part of the international application as filed:
- in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
- b. furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
- c. furnished subsequent to the international filing date for the purposes of international search only:
- in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
 - on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

**WRITTEN OPINION OF THE
 INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/CN2018/095003

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-21</u>	YES
	Claims	<u>NONE</u>	NO
Inventive step (IS)	Claims	<u>NONE</u>	YES
	Claims	<u>1-21</u>	NO
Industrial applicability (IA)	Claims	<u>1-21</u>	YES
	Claims	<u>NONE</u>	NO

2. Citations and explanations :

Reference is made to the following documents:

- D1: WO 2018-090289 A1 (BAIDU.COM TIMES TECHNOLOGY (BEIJING) CO., LTD. et al.)
 24 May 2018
 D2: US 2005-0234629 A1 (TOSHIMITSU MARUKI) 20 October 2005
 D3: US 2011-0141136 A1 (ANDREW JOHN CARDNO et al.) 16 June 2011

2.1 Novelty and Inventive Step (PCT Article 33(2) and (3))

2.1.1 Independent Claim 1

Claim 1 is an independent claim and relates to a computer-implemented method.

D1, which is considered to be the closest prior art to the subject matter of claim 1, discloses a method comprising:

- determining a current speed of the autonomous vehicle (see claim 4 in D1);
- calculating a first torque force for accelerating an autonomous vehicle to maneuver the autonomous vehicle, wherein calculating the first torque force comprises determining a first speed representing a target speed of the autonomous vehicle to maneuver the autonomous vehicle at a first reference time (see claims 1-2 in D1);
- calculating an error value as the difference between a target value and an actual value and applying a correction based on proportional, integral, and derivative terms, denoted as P, I, and D respectively, wherein a PID controller is a control loop feedback mechanism (see paragraph [0066] in D1); and
- controlling a subsequent speed of an ADV based on a throttle-brake torque force by a control module of a perception and planning system (see paragraph [0067] and figure 8 in D1).

The subject matter of claim 1 differs from that of D1 in updating a portion of a calibration

Continued on Supplemental Box

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. Claims 1, 12 and 17 are unclear in that the term 'the calibration table' has not been previously defined. Therefore, Claims 1, 12 and 17 do not meet the requirements of PCT Article 6.
2. Claim 9, dependent on claim 8, is worded in reference to 'the update point' of claim 8. However, claim 9 is unclear in that the term 'the update point' has not been defined in claim 8, but claim 4. Therefore, claim 9 does not meet the requirements of PCT Article 6.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/CN2018/095003

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of : Box No. V

table based on the determined feedback error. However, the different features can be merely matters of design option in view of the combined features of D1 considering adjusting PID constants during operation of the ADV by the control module of perception and planning system (see paragraph [0066] in D1); and D2 which is in the same technical field as D1, considering inputting the deviation between the driving force command and the actual driving force to an adding section to correct the error of a driving force characteristic map (see paragraph [0020] in D2). Accordingly, it would be obvious to a person skilled in the art to combine the disclosures of D1 and D2, thereby arriving at the claim 1. Therefore, claim 1 is novel under PCT Article 33(2), but lacks an inventive step under PCT Article 33(3).

2.1.2 Dependent Claims 2-11

Claims 2-11 are directly or indirectly dependent on claim 1.

The additional feature of claim 2 can be merely a matter of design option in view of the feature of D1 considering that an inertial measurement (IMU) unit 213 may sense position and orientation changes of the autonomous vehicle based on inertial acceleration (see paragraph [0033] in D1).

The additional features of claims 3-6 are known from the features of D2 considering a driving force characteristic map where an accelerator opening has been determined in response to an intersection of the driving force and the vehicle speed (see paragraph [0018] and figure 3 in D2).

The additional features of claims 7-9 are known from the features of D3 considering inverse distance weighting interpolation function to be calculated at a point (X,Y), which is an unknown point, and which is called the interpolation point (see paragraphs [0313]-[0323] in D3).

The additional feature of claim 10 is characterized in that determining a feedback error based on the acceleration measurement and the expected acceleration includes limiting the feedback error to a predetermined minimum/maximum. However, this feature comes within the scope of the customary practice followed by a person skilled in the art, especially in the feedback circuit.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/CN2018/095003

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of : Previous Page

The additional feature of claim 11 can be merely matters of design option in view of the combined features of D1 considering determining a current speed of the autonomous vehicle (see claim 4 in D1); calculating a first torque force for accelerating an autonomous vehicle to maneuver the autonomous vehicle, wherein calculating the first torque force comprises determining a first speed representing a target speed of the autonomous vehicle to maneuver the autonomous vehicle at a first reference time (see claims 1-2 in D1); and D2 which is in the same technical field as D1, considering inputting the deviation between the driving force command and the actual driving force to an adding section to correct the error of a driving force characteristic map (see paragraph [0020] in D2).

Accordingly, it would be obvious to a person skilled in the art to combine the disclosures of D1 and D2 to arrive at claims 2-6 and 10-11, and to combine the disclosures of D1-D3 to arrive at claims 7-9. Therefore, claims 2-11 are novel under PCT Article 33(2), but lack an inventive step under PCT Article 33(3).

2.1.3 Independent Claim 12

Claim 12 relates to a non-transitory machine-readable medium. As the features of independent claim 12 essentially correspond to those of claim 1 except for the category of invention, the same reasoning as in claim 1 applies to claim 12. Therefore, claim 12 is novel under PCT Article 33(2), but lacks an inventive step under PCT Article 33(3) as being obvious over D1 in view of D2.

2.1.4 Dependent Claims 13-16

Claims 13-16 are dependent on claim 12.

The additional features of claims 13-16 essentially correspond to those of claims 2-5, respectively. Accordingly, the same reasoning as in claims 2-5 applies to claims 13-16. Therefore, claims 13-16 are novel under PCT Article 33(2), but lack an inventive step under PCT Article 33(3) as being obvious over D1 in view of D2.

2.1.5 Independent Claim 17

Claim 17 relates to a data processing system. As the features of independent claim 17 essentially correspond to those of claim 1 except for the category of invention, the same reasoning as in claim 1 applies to claim 17. Therefore, claim 17 is novel under PCT Article

Continued on The Next Page

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/CN2018/095003

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of : Previous Page

33(2), but lacks an inventive step under PCT Article 33(3) as being obvious over D1 in view of D2.

2.1.6 Dependent Claims 18-21

Claims 18-21 are dependent on claim 17.

The additional features of claims 18-21 essentially correspond to those of claims 2-5, respectively. Accordingly, the same reasoning as in claims 2-5 applies to claims 18-21. Therefore, claims 18-21 are novel under PCT Article 33(2), but lack an inventive step under PCT Article 33(3) as being obvious over D1 in view of D2.

2.2 Industrial Applicability (PCT Article 33(4))

Claims 1-21 are industrially applicable under PCT Article 33(4).