

PATENT COOPERATION TREATY
PCT
INTERNATIONAL SEARCH REPORT
(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference BDIDI-004WO2	FOR FURTHER ACTION	
See Form PCT/ISA/220 as well as, where applicable, item 5 below.		
International application No. PCT/US2019/068606	International filing date (<i>day/month/year</i>) 26/12/2019	(Earliest) Priority Date (<i>day/month/year</i>) 28/12/2018
Applicant DIDI RESEARCH AMERICA, LLC		

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 6 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 purpose 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. 2

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.

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:

because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:

because they relate 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, specifically:

3. Claims Nos.:

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

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please refer to Supplemental Box (Continuation of Box No. III).

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

No protest accompanied the payment of additional search fees.

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A. CLASSIFICATION OF SUBJECT MATTER

G06F 9/455 (2006.01) G06F 15/16 (2006.01) G06F 9/38 (2006.01) G08G 1/00 (2006.01)

According to International Patent Classification (IPC)

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06F; G08G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

FAMPAT, IEEE, CNKI: simulate, emulate, single, same, identical, process, thread, chip, serial, sequential, successive, chain, nodelet, subsystem, mode, concurrent, parallel, simultaneous, product, vehicle, car, automobile, time, period, duration, schedule, plan, execute, 仿真, 模拟, 单一, 单个, 同样, 一样, 处理器, 线程, 进程, 串联, 顺序, 串行, 节点小程序, 子系统, 并发, 同时, 平行, 并行, 车, 汽车, 车辆, 管理, 计划, 安排, 时间, 时段 and other related terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2018/0203445 A1 (MICKS A. E. ET AL.) 19 July 2018 Figs. 1A-1B, 3A-3C; Paras. [0025]-[0045], [0055]-[0065]	1-5
X	US 2012/0221311 A1 (SHACHAR Y. ET AL.) 30 August 2012 Figs. 1-3; Paras. [0036]-[0045]	1-5
A	CN 102929158 A (BEIJING HWA CREATE) 13 February 2013 The whole document, especially Figs. 2-3; Paras. [0068]-[0090] of the original non-English language document (a machine translation is enclosed only for your reference)	

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

*Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"D" document cited by the applicant in the international application

"E" earlier application or patent but published on or after the international filing date

"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)

"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

"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

"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

"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

"&" document member of the same patent family

Date of the actual completion of the international search

30/03/2020

(day/month/year)

Date of mailing of the international search report

30/03/2020

(day/month/year)

Name and mailing address of the ISA/SG



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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2012/0158817 A1 (LAUDERDALE C. G. ET AL.) 21 June 2012 The whole document, especially Paras. [0003]-[0005]	
A	US 2011/0161966 A1 (TAMIYA Y. ET AL.) 30 June 2011 The whole document, especially Figs. 1, 4, 5, 8, 11; Paras. [0021], [0031], [0034], [0067]-[0068], [0071]-[0073], [0079]-[0084]	
A	US 2011/0218792 A1 (WHISNANT K. ET AL.) 8 September 2011 The whole document, especially Figs. 2-3; Paras. [0068]-[0090]	
X	US 2016/0092247 A1 (BRANSON M. J. ET AL.) 31 March 2016 Figs. 6-7; Paras. [0051]-[0061]	6-20
A	Multiple threads on a single CPU. 13 March 2006 [Retrieved on 2020-03-13 from http://www.qnx.com/developers/docs/qnxcar2/index.jsp?topic=%2Fcom.qnx.doc.neutrino.getting_started%2Ftopic%2Fs1_procs_Multiple_threads_single_CPU.html] The whole document	

INTERNATIONAL SEARCH REPORT
Information on patent family members

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Note: This Annex lists known patent family members relating to the patent documents cited in this International Search Report. This Authority is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2018/0203445 A1	19/07/2018	CN 108304782 A DE 102018100469 A1 RU 2017146151 A GB 2560412 A MX 2018000463 A	20/07/2018 19/07/2018 28/06/2019 12/09/2018 09/11/2018
US 2012/0221311 A1	30/08/2012	US 2009/0292518 A1 IL 173711 A WO 2007/093985 A2	26/11/2009 30/11/2010 23/08/2007
CN 102929158 A	13/02/2013	NONE	
US 2012/0158817 A1	21/06/2012	EP 2652634 A1 JP 2013546106 A CN 103262064 A RU 2013125719 A CA 2820081 A1 WO 2012/083188 A1	23/10/2013 26/12/2013 21/08/2013 27/01/2015 21/06/2012 21/06/2012
US 2011/0161966 A1	30/06/2011	JP 2011134275 A	07/07/2011
US 2011/0218792 A1	08/09/2011	KR 20130048204 A JP 2013521583 A WO 2011/109707 A2 EP 2542969 A2 CN 102782651 A	09/05/2013 10/06/2013 09/09/2011 09/01/2013 14/11/2012
US 2016/0092247 A1	31/03/2016	US 2014/0278337 A1	18/09/2014

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Supplemental Box (Continuation of Box No. III)

This International Searching Authority found multiple inventions in this international application, as follows:

Group 1: Claims 1-5 are directed to a system comprising a first computing device for concurrently processing of the sensor data and a second computing device for serially simulation.

Group 2: Claims 6-20 are directed to the time scheduling of the first, second and third nodelet for simulation.

Please refer to **Box No. IV** of Written Opinion of The International Searching Authority (Form PCT/ISA/237) for detailed explanation.