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16/198,653 21 November 2018 (21.11.2018) US
- (71) Applicant: ZOOX, INC. [US/US]; 1149 Chess Drive, Foster City, CA 94404 (US).

- (72) Inventors: ASKELAND, Jacob, Lee; 1925 Borchers Drive, San Jose, CA 95124 (US). CAHOON, Ryan, Martin; c/o Zoox, Inc., 1149 Chess Drive, Foster City, CA 95124 (US). KING, Andrew, Lewis; c/o Zoox, Inc., 1149 Chess Drive, Foster City, CA 95124 (US). BROWN, Christopher, Yeates; c/o Zoox, Inc., 1149 Chess Drive, Foster City, CA 95124 (US).
- (74) Agent: KONDRYSZYN, Yanek, A. et al.; Lee & Hayes, P.C., 601 W. Riverside Ave., Suite 1400, Spokane, WA 99201 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,

(54) Title: COORDINATED COMPONENT INTERFACE CONTROL FRAMEWORK

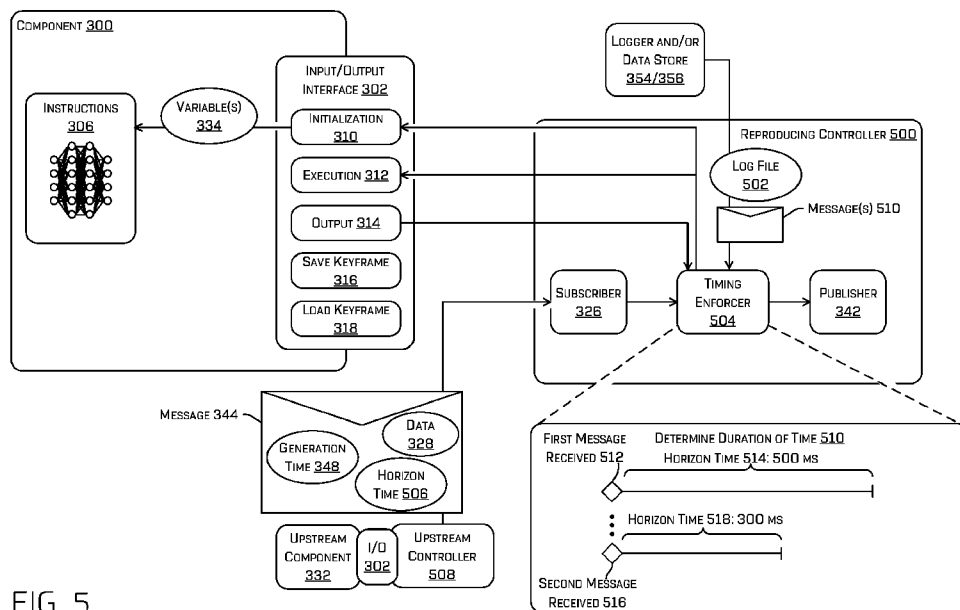


FIG. 5

(57) Abstract: A coordinated component interface control framework may deterministically reproduce behavior of a data processing pipeline. The framework may include a controller that controls input to, output from, and/or execution of a component of the pipeline (e.g., via an interface). The framework may also tune performance of the pipeline and/or enable parallel processing of the pipeline, even across different machines, while preserving the ability to deterministically reproduce behavior of the pipeline. An interface may facilitate replacing a component with a different and/or updated component and/or changing a type of controller that controls the component via the interface. For example, the different types of controllers may facilitate communication between components controlled by other controllers (and/or that aren't controlled by a controller), controllers that generate reproducibility data so that component behavior may be reproduced, controllers that reproduce component behavior, and/or controllers that tune performance of the pipeline, e.g., by varying



MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
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INTERNATIONAL SEARCH REPORT

International application No PCT/US2019/062502

A. CLASSIFICATION OF SUBJECT MATTER
 INV. G06F9/448
 ADD. G06F11/30 G06F11/34

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)
 G06F

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)
 EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2006/075265 A1 (HAMAOKA YOSHIYUKI [US] ET AL) 6 April 2006 (2006-04-06) paragraph [0038] - paragraph [0040] paragraph [0061] - paragraph [0067] paragraph [0094] - paragraph [0097] figures 3, 6, 10, 11 -----	1-8
A	WO 2017/179120 A1 (MITSUBISHI ELECTRIC CORP [JP]) 19 October 2017 (2017-10-19)	1-8
A,P	& EP 3 432 148 A1 (MITSUBISHI ELECTRIC CORP [JP]) 23 January 2019 (2019-01-23) paragraph [0014] - paragraph [0015] paragraph [0061] - paragraph [0268] figures 5, 9 ----- -/--	1-8

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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"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 20 February 2020	Date of mailing of the international search report 23/06/2020
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Eigner, Robert
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INTERNATIONAL SEARCH REPORT

International application No PCT/US2019/062502

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 2007/198676 A1 (VERTES MARC P [FR]) 23 August 2007 (2007-08-23) paragraph [0010] - paragraph [0067] paragraph [0091] - paragraph [0109] paragraph [0131] - paragraph [0135] paragraph [0262] - paragraph [0271] figures 1, 9, 10 -----	1-8
A	WO 2016/183563 A1 (WALLEYE SOFTWARE LLC [US]) 17 November 2016 (2016-11-17) figures 1, 5-7 paragraph [0001] - paragraph [0024] paragraph [0035] - paragraph [0043] paragraph [0055] - paragraph [0094] -----	1-8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/062502

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:

see additional sheet

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 an 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.:

1-8

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-8

The subject-matter of this invention is directed at replacing components in a sequential data processing scenario where the replacement depends on the comparison of the behavior and detection of deviations between replaced and replacement component.

2. claims: 9-15

The subject-matter of this invention is directed at determining points in time to trigger the execution of software components and publishing the subsequent output of the the execution along with the time when it was obtained.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2019/062502

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