



(11) **EP 2 804 119 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:  
**11.03.2015 Bulletin 2015/11**

(51) Int Cl.:  
**G06F 19/00 (2011.01)**

(43) Date of publication A2:  
**19.11.2014 Bulletin 2014/47**

(21) Application number: **14168538.8**

(22) Date of filing: **15.05.2014**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**

- **Hasegawa, Yasutaka**  
**Chiyoda-ku, Tokyo 100-8280 (JP)**
- **Ban, Hideyuki**  
**Chiyoda-ku, Tokyo 100-8280 (JP)**
- **Nagasaki, Takeshi**  
**Chiyoda-ku, Tokyo 100-8280 (JP)**
- **Shinjo, Hiroshi**  
**Chiyoda-ku, Tokyo 100-8280 (JP)**

(30) Priority: **17.05.2013 JP 2013104664**

(71) Applicant: **Hitachi Ltd.**  
**Tokyo (JP)**

(74) Representative: **Moore, Graeme Patrick et al**  
**Mewburn Ellis LLP**  
**33 Gutter Lane**  
**London**  
**EC2V 8AS (GB)**

(72) Inventors:  
• **Miyoshi, Toshinori**  
**Chiyoda-ku, Tokyo 100-8280 (JP)**

(54) **Analysis System and Health Business Support Method**

(57) It is provided an analysis system comprising: a causation/transition structure calculating unit generating a graph structure including a node and a probability variable relating to item, and a probabilistic dependency defined by one of a directed link or an undirected link between the nodes; a node generating unit generating an event space of the nodes; a probability calculating unit calculating a conditional probability of the graph structure; a state transition model reconstructing unit reconstructing a state transition model with a graph structure, an event space and a conditional probability including specified probability variables based on a state transition model; a disease state transition estimating unit estimating a disease state transition probability based on the reconstructed state transition model; and a health guidance supporting unit selecting a subject for health guidance and a content of health guidance based on the estimated disease state transition probability.

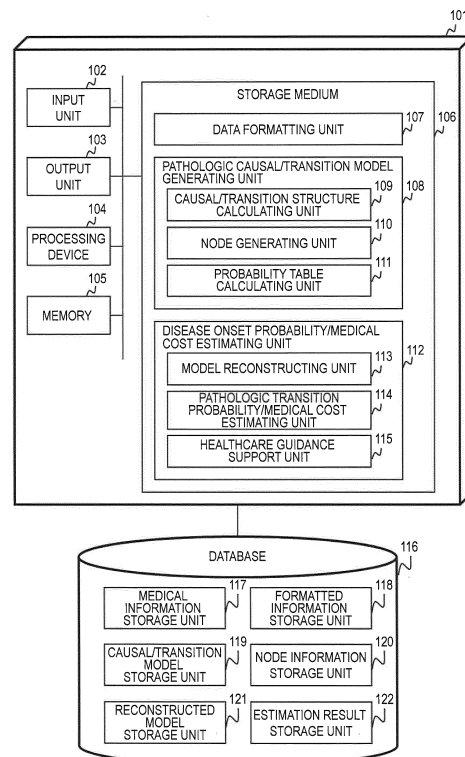


Fig. 1

**EP 2 804 119 A3**



EUROPEAN SEARCH REPORT

Application Number  
EP 14 16 8538

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2011/082712 A1 (EBERHARDT III JOHN S [US] ET AL) 7 April 2011 (2011-04-07) * abstract; claims 1-5 * * paragraph [0028] * * paragraph [0035] * * paragraph [0039] - paragraph [0040] * * paragraph [0049] - paragraph [0050] * * paragraph [0062] - paragraph [0065] * * paragraph [0073] * -----	1-15	INV. G06F19/00
X	US 2013/085773 A1 (YAO MYLENE [US] ET AL) 4 April 2013 (2013-04-04) * claims 36,40,41 * * paragraph [0008] - paragraph [0009] * * paragraph [0021] * * paragraph [0090] * -----	1-15	
X	US 6 601 055 B1 (ROBERTS LINDA M [US]) 29 July 2003 (2003-07-29) * column 1, line 66 - column 2, line 36 * * column 10, line 56 - column 11, line 31; figures 38A,38B * * column 25, line 15 - line 36 * * column 27, line 60 - column 28, line 47 * -----	1-15	TECHNICAL FIELDS SEARCHED (IPC) G06F
A	US 6 687 685 B1 (SADEGHI SARMADE [US] ET AL) 3 February 2004 (2004-02-03) * abstract; claims 1-13 * * column 5, line 9 - line 38 * * column 7, line 59 - line 67; table 1 * ----- -/--	1-15	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 January 2015	Examiner Filloy García, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number  
EP 14 16 8538

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	MELONI A ET AL: "Mutual Information Preconditioning Improves Structure Learning of Bayesian Networks From Medical Databases", IEEE TRANSACTIONS ON INFORMATION TECHNOLOGY IN BIOMEDICINE, IEEE SERVICE CENTER, LOS ALAMITOS, CA, US, vol. 13, no. 6, November 2009 (2009-11), pages 984-989, XP011345603, ISSN: 1089-7771, DOI: 10.1109/TITB.2009.2026273 * the whole document * -----	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 27 January 2015	Examiner Filloy García, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	

1  
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 16 8538

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10

27-01-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011082712 A1	07-04-2011	NONE	
-----			
US 2013085773 A1	04-04-2013	CA 2849313 A1	04-04-2013
		CN 103843030 A	04-06-2014
		EA 201400398 A1	28-11-2014
		EP 2761577 A1	06-08-2014
		US 2013085773 A1	04-04-2013
		WO 2013049771 A1	04-04-2013
-----			
US 6601055 B1	29-07-2003	NONE	
-----			
US 6687685 B1	03-02-2004	NONE	
-----			

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82