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(54) CLUSTERING, NOISE REDUCTION AND VISUALIZATION METHOD FOR DOPPLER ULTRASOUND IMAGES

(57) The invention provides an analysis system for Doppler ultrasound image includes: a capture device, a processing device, and an output device. The capture device obtains a plurality of Doppler ultrasound images. The processing device arranges the color value in each pixel of the images based on the time domain, and obtains a reference sequence through a referencing method, furthermore performs a clustering method to obtain a plurality of correlation coefficient values, then uses a clustering and noise reducing method to classify into a primary pulsatile signal, a secondary pulsatile signal, and a noise signal, finally annotates the primary pulsatile signal, a secondary pulsatile signal, and a noise signal with different color values, respectively. The output device displays a plurality of visualized pulsatile ultrasound images for visualization.

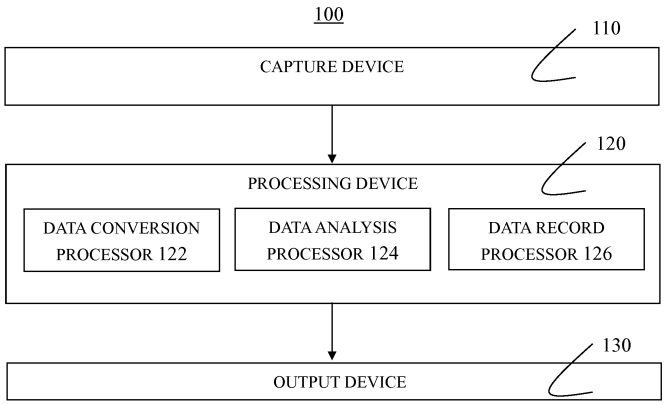

FIG. 1

EP 3 184 051 A3

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EUROPEAN SEARCH REPORT

Application Number
EP 16 20 5350

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	US 5 279 302 A (TAMANO SATOSHI [JP] ET AL) 18 January 1994 (1994-01-18) * abstract; figures 1-4 * * column 1, line 56 - column 2, line 11 * * column 3, line 27 - column 6, line 59 * * column 2, line 20 - column 3, line 7 *	1-16	INV. A61B8/08 A61B8/06 A61B8/00 G01S15/89 G06F17/30
A	JP H08 173417 A (GE YOKOGAWA MED SYST LTD) 9 July 1996 (1996-07-09) * abstract; figures 1,5,10 * * paragraphs [0004] - [0006], [0011] - [0012], [0020], [0025], [0028] *	1-16	
A	US 2003/181814 A1 (JI TING-LAN [US] ET AL) 25 September 2003 (2003-09-25) * paragraphs [0020] - [0053]; figures 1,2 *	1-16	
A	US 2013/184588 A1 (PALTI YORAM [IL]) 18 July 2013 (2013-07-18) * paragraphs [0034] - [0044]; figure 3 *	1-16	TECHNICAL FIELDS SEARCHED (IPC)
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A	US 2013/046168 A1 (SUI LEI [US]) 21 February 2013 (2013-02-21) * paragraphs [0047] - [0050] *	1-16	
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A	US 6 245 018 B1 (LEE MIN HWA [KR]) 12 June 2001 (2001-06-12) * abstract; figures 1-3 * * column 2, line 35 - columns 5-41 *	1-16	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 May 2017	Daoukou, Eleni

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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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

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 20 5350

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
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19-05-2017

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

专利名称(译)	多普勒超声图像的聚类，降噪和可视化方法		
公开(公告)号	EP3184051A3	公开(公告)日	2017-07-19
申请号	EP2016205350	申请日	2016-12-20
[标]申请(专利权)人(译)	美国医科华股份有限公司		
申请(专利权)人(译)	AMCAD BIOMED CORPORATION		
当前申请(专利权)人(译)	AMCAD BIOMED CORPORATION		
[标]发明人	CHEN ARGON CHEN JIA JIUN SHEN YU HAN LIU CHENG HSIEN		
发明人	CHEN, ARGON CHEN, JIA-JIUN SHEN, YU-HAN LIU, CHENG-HSIEN		
IPC分类号	A61B8/08 A61B8/06 A61B8/00 G01S15/89 G06F17/30		
CPC分类号	A61B8/06 A61B8/08 A61B8/0891 A61B8/463 A61B8/468 A61B8/469 A61B8/488 A61B8/5207 A61B8/5223 G01S7/52036 G01S7/52071 G01S7/52074 G01S7/52077 G01S15/8988 G16H50/30 G01S7/52053 G06K9/42 G06K9/4642 G06K9/4652 G06K9/4661 G06K9/6215 G06K9/6218 G06K9/623 G06K9/628		
优先权	104143257 2015-12-23 TW		
其他公开文献	EP3184051A2 EP3184051B1		
外部链接	Espacenet		

摘要(译)

本发明提供了一种用于多普勒超声图像的分析系统，包括：捕获装置，处理装置和输出装置。捕获装置获得多个多普勒超声图像。处理装置基于时域在图像的每个像素中排列颜色值，并通过参照方法获得参考序列，进一步执行聚类方法以获得多个相关系数值，然后使用聚类和降噪分类为主脉动信号，二次脉动信号和噪声信号的方法分别最终分别标注主脉动信号，次脉冲信号和具有不同颜色值的噪声信号。输出装置显示多个可视化的脉冲超声图像，用于可视化。

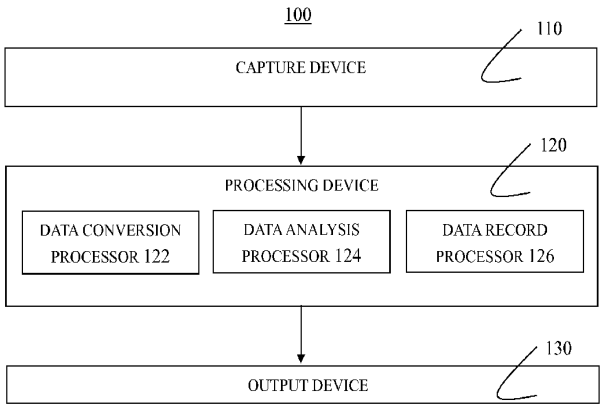

FIG. 1