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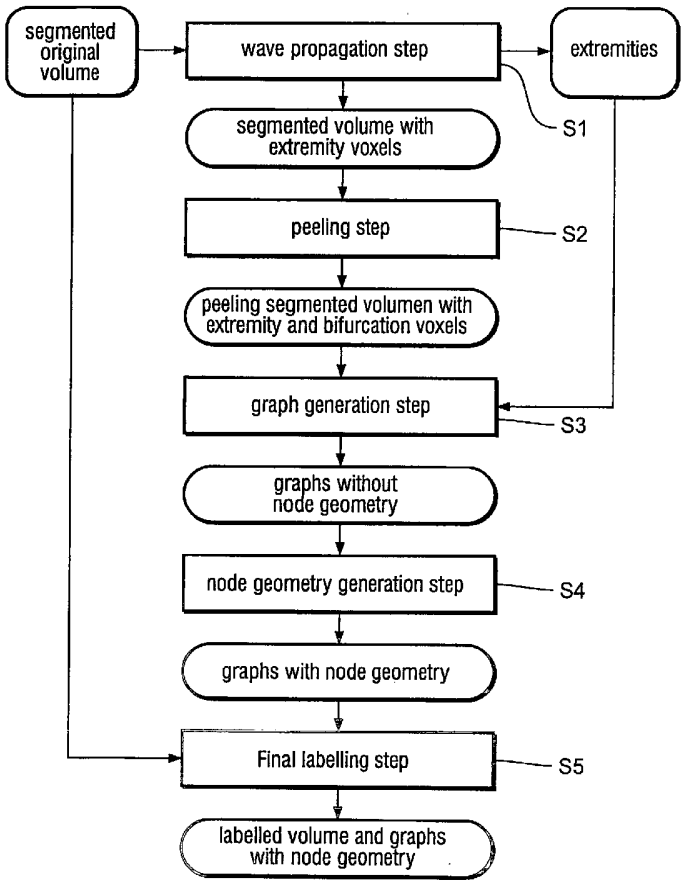
(54) Title: METHOD FOR AUTOMATIC BRANCH LABELLING



(57) Abstract: The invention relates to a method of analysing an object data set in which a tubular structure having a plurality of branches and bifurcations occurs, wherein said object data set assigns data values to positions in a multi-dimensional space, which data values relate to an object to be examined. In order to improve accuracy when applying the invention particularly for fully-automated vessel tracing, particularly in the vessel structure of the brain of a patient, the following steps are proposed according to the invention: finding the extremities of the branches of said tubular structure, forming a skeleton of branches and bifurcations by a peeling step, forming directional graphs for the branches of said skeleton between two neighbouring bifurcations or between a bifurcation and an extremity based on said skeleton, assigning a label to the positions along the directional graphs, wherein for each branch of each directional graph aunique label is selected, determining the geometry of the branches and bifurcations of said tubular structure so that positions can be classified as belonging to either a bifurcation or a branch, andassigning a final label to the positions along the branches and of the bifurcations of said tubular structure, wherein for each branch and each bifurcation a unique label is selected.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06T7/00

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)
IPC 7 G06T 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 practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX, BIOSIS, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	STEFANCIK R M ET AL: "HIGHLY AUTOMATED SEGMENTATION OF ARTERIAL AND VENOUS TREES FROM THREE-DIMENSIONAL MAGNETIC RESONANCE ANGIOGRAPHY (MRA)" INTERNATIONAL JOURNAL OF CARDIAC IMAGING, DORDRECHT, NL, vol. 17, no. 1, February 2001 (2001-02), pages 37-47, XP009000839 ISSN: 0167-9899 abstract section "Introduction" section "Knowledge-based approach to vessel detection and artery-vessel separation" section "Tree-structure generation" section "Optimal vessel path calculation" section "Vessel segment labeling" figures 2,3 --- -/--	1-9

[X] Further documents are listed in the continuation of box C.

[ ] Patent family members are listed in annex.

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

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Date of the actual completion of the international search	Date of mailing of the international search report
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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	PUIG A ET AL: "Features detection and navigation on neurovascular trees" PATTERN RECOGNITION, 2000. PROCEEDINGS. 15TH INTERNATIONAL CONFERENCE ON SEPTEMBER 3-7, 2000, LOS ALAMITOS, CA, USA,IEEE COMPUT. SOC, US, 3 September 2000 (2000-09-03), pages 76-79, XP010533029 ISBN: 0-7695-0750-6 the whole document	1-9
A	QUEK F K H ET AL: "VESSEL EXTRACTION IN MEDICAL IMAGES BY WAVE-PROPAGATION AND TRACEBACK" IEEE TRANSACTIONS ON MEDICAL IMAGING, IEEE INC. NEW YORK, US, vol. 20, no. 2, 1 February 2001 (2001-02-01), pages 117-131, XP001038899 ISSN: 0278-0062 abstract section "I. Introduction" section "IV. Digital Wave Propagation and Traceback" section "V. B. Wave Count Segments"	1-9
A	SATO M ET AL: "TEASAR: tree-structure extraction algorithm for accurate and robust skeletons" COMPUTER GRAPHICS AND APPLICATIONS, 2000. PROCEEDINGS. THE EIGHTH PACIFIC CONFERENCE ON HONG KONG, CHINA 3-5 OCT. 2000, LOS ALAMITOS, CA, USA,IEEE COMPUT. SOC, US, 3 October 2000 (2000-10-03), pages 281-449, XP010523020 ISBN: 0-7695-0868-5 the whole document	1-9