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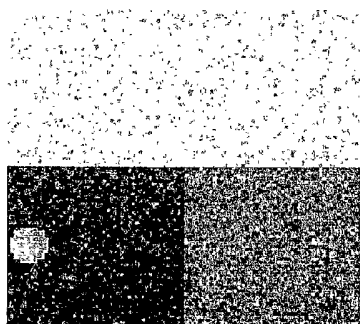
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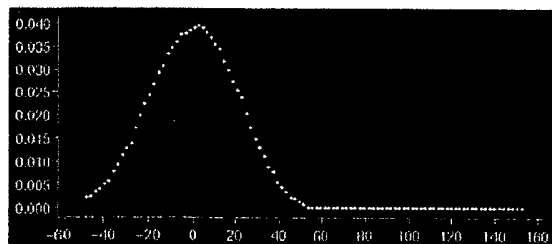
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: UNSUPERVISED DATA SEGMENTATION



a.



b.

a.) Seed for Class  $C_j$ . b.) Initial probability for  $P(v_j | d_j \in C_j)$ .

(57) Abstract: An unsupervised method of segmenting data sets using a region growing technique in which data points are initially assigned to a single class, new classes are seeded and points in the data set tested by calculating the probability that they belong to the new class. The probability distributions used in the calculation are adapted as points are reassigned. Classes which fail to grow are discarded. The technique may be applied to the segmentation of different parts of data sets in which the data points are taken from medical images. The method may be applied to the demarcation of different parts of structures, e.g. in the medical field demarcating an aneurysm from the surrounding blood vessels in an image or 3-D model of a patient's vasculature. The method may involve using a shape descriptor which is representative of the shape of the structure at each point under consideration. Thus the different parts are distinguished on the basis of their shape.

WO 2003/075209 A3

## INTERNATIONAL SEARCH REPORT

Internatio lication No

PCT/GB 03/00891

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06T5/00

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 G06K

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

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 229 918 B1 (TOYAMA KENTARO) 8 May 2001 (2001-05-08) column 2, line 34 - line 51; claims 1-10	1-22, 36-39
A	US 5 903 664 A (CURWEN RUPERT WILLIAM MELDRUM ET AL) 11 May 1999 (1999-05-11) column 2, line 6 - line 35	1-22, 36-39
A	US 5 452 367 A (BICK ULRICH ET AL) 19 September 1995 (1995-09-19) claims 1-4	1-22, 36-39

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

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

\*E\* earlier document 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.

\*&amp;\* document member of the same patent family

Date of the actual completion of the international search

11 August 2003

Date of mailing of the international search report

18.12.2003

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# INTERNATIONAL SEARCH REPORT

Inter. ....al application No.  
PCT/GB 03/00891

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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 fee, this Authority did not invite payment of any additional fee.
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.:

1-22, 36-39

### Remark on Protest

The additional search fees were accompanied by the applicant's protest.

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: 1-22,36-39

unsupervised data segmentation based on probability  
calculations

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2. claims: 23-35,40

segmenting different parts of a structure, using local shape  
descriptors

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# INTERNATIONAL SEARCH REPORT

Internatic      plication No  
PCT/GB 03/00891

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6229918	B1	08-05-2001	NONE
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