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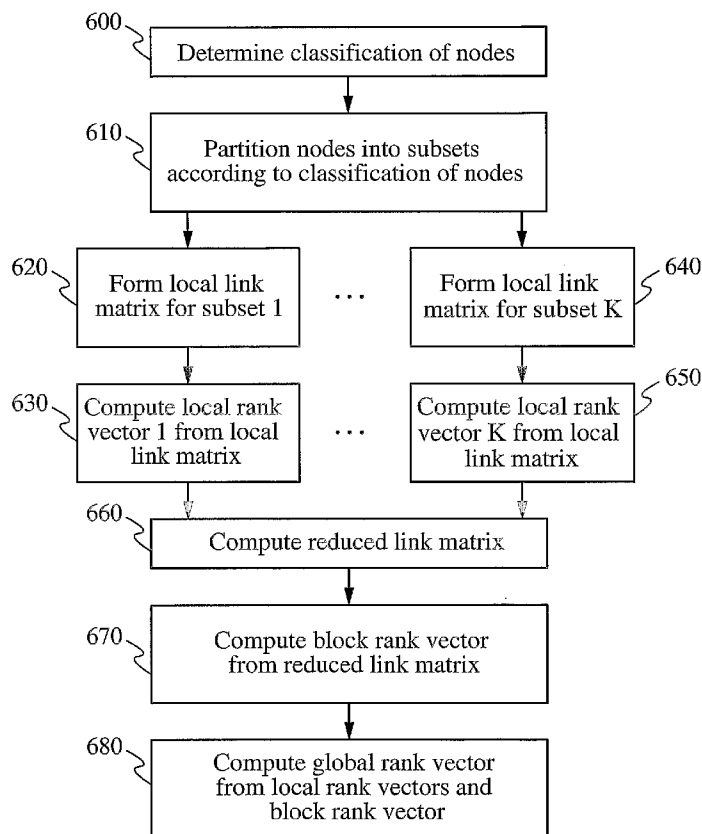
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(54) Title: IMPROVED METHODS FOR RANKING NODES IN LARGE DIRECTED GRAPHS



(57) Abstract: Techniques for assigning ranks (fig. 6, 630, 670, 680) to nodes in a large linked database (fig. 2) such as world wide web or any other hypermedia database, partition the nodes so that the link matrix (fig. 1) has a predominantly block-diagonal form (fig. 1&2). Within each block (fig. 5), a local rank (630, 670) is computed for nodes in the block (fig. 5), possibly by different computer in a distributed computing environment. A block rank is then estimated for each block (fig. 5) as a whole, and may optionally include block-level weights to implement customized ranking (fig. 6, 630, 670, 680). The local ranks and block ranks are then combined to form a global rank, which may be used to rank the nodes. Alternatively, a global rank vector for the database may be used as an initial vector in an iterative link-based ranking schema to obtain more accurate global ranks for the nodes. The global rank vector (fig. 6, 630, 670, 680) may be divided to provide local rank vectors (fig. 6, 630, 670, 680) for use in subsequent applications of the method.

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# INTERNATIONAL SEARCH REPORT

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**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G06F 17/30  
 US CL : 707/3, 5, 100

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)  
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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)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,446,891 A (KAPLAN et al) 29 August 1995 (29.08.1995), column 16, lines 40-55	1-28
Y	US 5,619,709 A (CAID et al) 08 April 1997 (08.04.1997), column. 11, lines 40-50.	1-28
Y	US 6,026,388 A (LIDDY et al) 15 February 2000 (15.03.2000), column 26, lines 1-10).	1-28
Y	US 6,101,515 A (WICAL et al) 08 August 2000 (08.08.2000), column 6, lines 30-40.	1-28

Further documents are listed in the continuation of Box C.

See patent family annex.

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