

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 December 2003 (11.12.2003)

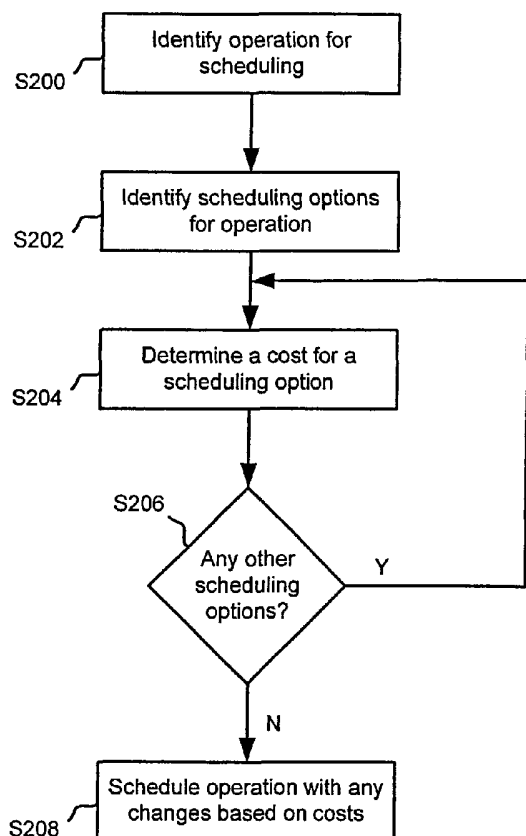
PCT

(10) International Publication Number
WO 2003/102768 A3

- (51) International Patent Classification⁷: G06F 9/45, 9/38
 - (21) International Application Number: PCT/US2003/015186
 - (22) International Filing Date: 14 May 2003 (14.05.2003)
 - (25) Filing Language: English
 - (26) Publication Language: English
 - (30) Priority Data: 10/160,665 31 May 2002 (31.05.2002) US
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 - (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.
 - (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
— with international search report

[Continued on next page]

(54) Title: METHOD FOR INSTRUCTION MODULO SCHEDULING BASED ON COST ESTIMATION



(57) Abstract: A process for scheduling operations using a cost is provided. A number of scheduling options are determined for an operation and a cost is computed for each scheduling option. The process then schedules the operation based on a computed cost.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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.

(88) Date of publication of the international search report:
28 October 2004

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/15186

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F9/45 G06F9/38

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 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, IBM-TDB, INSPEC, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TANG ET AL: "Thread Partitioning and Scheduling based on Cost Model" PROCEEDINGS OF THE NINTH ANNUAL ACM SYMPOSIUM ON PARALLEL ALGORITHMS AND ARCHITECTURES, 'Online! 1997, pages 272-281, XP002294224 ACM PRESS NEW YORK, NY, USA ISBN: 0-89791-890-8 Retrieved from the Internet: URL:http://doi.acm.org/10.1145/258492.258519> 'retrieved on 2004-08-25! abstract figure 5 page 272, right-hand column, lines 39-50 page 275, right-hand column, lines 1-10 page 276, right-hand column, line 40 - page 277, right-hand column, line 2 ----- -/--	1-21

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	*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
E earlier document but published on or after the international filing date	*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
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)	*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.
O document referring to an oral disclosure, use, exhibition or other means	*S* document member of the same patent family
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 30 August 2004	Date of mailing of the international search report 22/09/2004
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Uhlmann, N
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/15186

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 202 993 A (WOODARD MICHAEL J ET AL) 13 April 1993 (1993-04-13) abstract figure 3 claim 1 column 2, lines 37-48 column 5, lines 33-49 column 6, lines 13-24 column 6, line 54 - column 7, line 2	1,2,10, 13-15,21
A	"MULTISEQUENCING A SINGLE INSTRUCTION STREAM SCHEDULING WITH SPACE-TIME TRADE-OFFS" IBM TECHNICAL DISCLOSURE BULLETIN, IBM CORP. NEW YORK, US, vol. 36, no. 2, 1 February 1993 (1993-02-01), pages 105-108, XP000354276 ISSN: 0018-8689 page 107, lines 29-37	1,3,13, 21
A	US 6 219 780 B1 (LIPASTI MIKKO HERMAN) 17 April 2001 (2001-04-17) abstract column 8, lines 20-55 column 10, lines 6-13 claims 1-4	1,4,5, 13,15
A	EP 0 926 596 A (TEXAS INSTRUMENTS INC) 30 June 1999 (1999-06-30) abstract claim 1	6-8, 16-18
A	US 5 712 996 A (SCHEPERS JOERG) 27 January 1998 (1998-01-27) abstract column 2, lines 41-53	9
A	US 6 301 653 B1 (SPENCE JOHN R ET AL) 9 October 2001 (2001-10-09) abstract column 6, lines 15-20	11,12, 19,20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/15186

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5202993	A	13-04-1993	DE 69229365 D1	15-07-1999
			DE 69229365 T2	27-04-2000
			EP 0501653 A2	02-09-1992
			JP 2720128 B2	25-02-1998
			JP 6208462 A	26-07-1994
			KR 9705456 B1	16-04-1997

US 6219780	B1	17-04-2001	NONE	

EP 0926596	A	30-06-1999	EP 0926596 A2	30-06-1999
			JP 11249896 A	17-09-1999
			US 6195756 B1	27-02-2001

US 5712996	A	27-01-1998	WO 9422079 A1	29-09-1994
			DE 59401478 D1	13-02-1997
			EP 0689694 A1	03-01-1996
			JP 8507889 T	20-08-1996

US 6301653	B1	09-10-2001	EP 1121634 A2	08-08-2001
			WO 0022508 A2	20-04-2000
