

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
18 December 2003 (18.12.2003)

PCT

(10) International Publication Number  
WO 2003/105082 A3

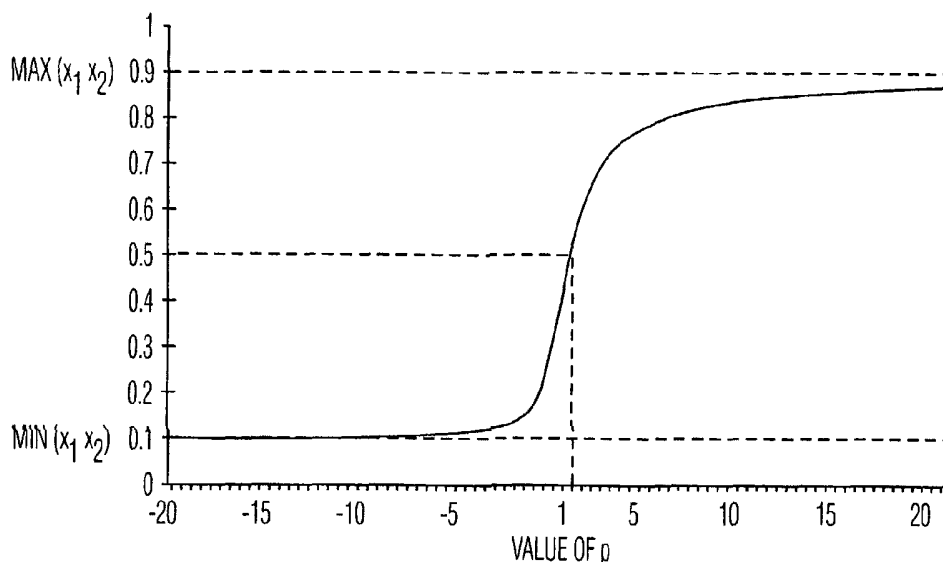
- (51) International Patent Classification<sup>7</sup>: G06N 7/00, H04N 7/16
- (21) International Application Number: PCT/IB2003/002182
- (22) International Filing Date: 19 May 2003 (19.05.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 10/165,932 10 June 2002 (10.06.2002) US
- (71) Applicant: KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (71) Applicant (for AE only): U.S. PHILIPS CORPORATION [US/US]; Avenue of the Americas, New York, NY 10510-8001 (US).
- (72) Inventor: BUCZAK, Anna, L.; P.O. Box 3001, Briarcliff Manor, NY 10510 (US).
- (74) Agent: KONINKLIJKE PHILIPS ELECTRONICS N.V.; c/o PIOTROWSKI, Daniel, P. O. Box 3001, Briarcliff Manor, NY 10510-8001 (US).
- (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, NI, 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

(88) Date of publication of the international search report:  
26 February 2004

[Continued on next page]

(54) Title: DECISION FUSION OF RECOMMENDER SCORES THROUGH FUZZY AGGREGATION CONNECTIVES



(57) Abstract: A method of fusing recommender scores includes the steps of: (a) providing a first recommender score for a topic of interest based on a first set of information; (b) providing a second recommender score for the topic of interest based on a second set of information; (c) fusing the first recommender score and the second recommender score by compensatory fuzzy aggregation connectives; and (d) providing a final recommendation for the topic of interest based on the fusion in step (c). The final recommendation can be output on one of a display unit and a television set. The compensatory fuzzy aggregation connectives used for fusing in step (c) may include a Generalized Mean or a Gamma Model. The first and second recommender scores, while related to same topic, could be scores for different people, such as a couple watching television.

WO 2003/105082 A3



---

*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.*

## INTERNATIONAL SEARCH REPORT

PCT/IB 03/02182

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 G06N7/00 H04N7/16

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 H04N 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

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02 11445 A (KONINKL PHILIPS ELECTRONICS NV) 7 February 2002 (2002-02-07) page 10, line 13 - line 24	1-3, 14-18
A	KAUSHAL KURAPATI ET AL: "A Multi-Agent TV Recommender" WORKSHOP ON PERSONALIZATION IN FUTURE TV, XX, XX, 13 July 2001 (2001-07-13), pages 1-8, XP002228385 figure 1 page 4, paragraph 4	1-3, 14-18

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.
- \*&\* document member of the same patent family

Date of the actual completion of the international search

17 November 2003

Date of mailing of the international search report

03/12/2003

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

Sindic, G

## INTERNATIONAL SEARCH REPORT

PCT/IB 03/02182

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>EHRMANTRAUT M ET AL: "THE PERSONAL ELECTRONIC PROGRAM GUIDE - TOWARDS THE PRE-SELECTION OF INDIVIDUAL TV PROGRAMS" PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON INFORMATION AND KNOWLEDGE MANAGEMENT CIKM, ACM, NEW YORK, NY, US, 12 November 1996 (1996-11-12), pages 243-250, XP002071337 page 246, right-hand column, paragraph 6 -page 247, left-hand column, paragraph 3 ---</p>	1
A	<p>DYCKHOFF H ET AL: "GENERALIZED MEANS AS MODEL OF COMPENSATIVE CONNECTIVES" FUZZY SETS AND SYSTEMS, NORTH-HOLLAND, AMSTERDAM, NL, vol. 14, no. 2, November 1984 (1984-11), pages 143-154, XP008019856 ISSN: 0165-0114 abstract ---</p>	1,4-7
A	<p>ZIMMERMANN H-J ET AL: "LATENT CONNECTIVES IN HUMAN DECISION MAKING" FUZZY SETS AND SYSTEMS, NORTH-HOLLAND, AMSTERDAM, NL, vol. 4, no. 1, July 1980 (1980-07), pages 37-51, XP008019859 ISSN: 0165-0114 abstract -----</p>	1

## INTERNATIONAL SEARCH REPORT

PCT/IB 03/02182

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0211445      A	07-02-2002	WO      0211445 A2 EP      1316214 A2	07-02-2002 04-06-2003
-----			