

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
2 October 2008 (02.10.2008)

PCT

(10) International Publication Number
WO 2008/118739 A3

(51) International Patent Classification:

H04N 7/26 (2006.01) **G06T 5/00** (2006.01)
G01S 13/90 (2006.01)

(21) International Application Number:

PCT/US2008/057629

(22) International Filing Date: 20 March 2008 (20.03.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

11/689,706 22 March 2007 (22.03.2007) US

(71) Applicant (for all designated States except US): **HARRIS CORPORATION** [US/US]; 1025 W. NASA Blvd., MS A-11I, Melbourne, Florida 32919 (US).

(72) Inventors: **ALLEN, Josef**; 2429 Apache Drive, Melbourne, Florida 32935 (US). **GANTHIER, Emile**; 4041 Hield Road, Palm Bay, Florida 32907 (US). **RAHMES, Mark**; 2620 Aston Circle, Melbourne, Florida 32954 (US). **WINTER, Matthew**; 310 Lago Circle, Apt. 102, West Melbourne, Florida 32904 (US).

(74) Agents: **YATSKO, Michael S.** et al.; Harris Corporation, 1025 W. NASA Blvd., MS A-11I, Melbourne, Florida 32919 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
13 November 2008

(54) Title: METHOD AND APPARATUS FOR COMPRESSION OF SAR IMAGES

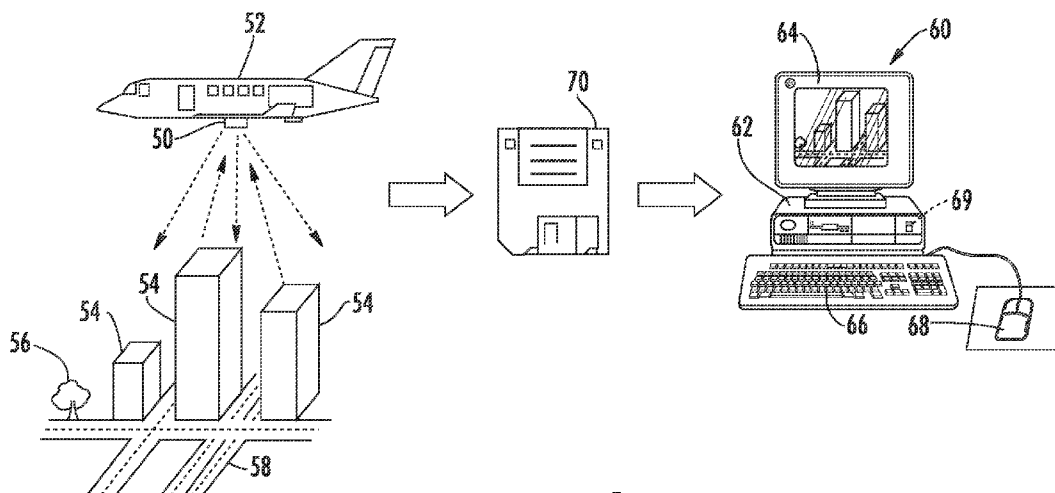


FIG. 1

(57) Abstract: A computer system 60 for compressing synthetic aperture radar (SAR) images includes a database for storing SAR images to be compressed, and a processor 69 for compressing a SAR image from the database. The compressing includes applying an anisotropic diffusion algorithm to the SAR image, and compressing the SAR image after applying the anisotropic diffusion algorithm thereto. Applying the anisotropic diffusion algorithm includes determining noise in the SAR, selecting a noise threshold for the SAR image based on the determined noise, and mathematically adjusting the anisotropic diffusion algorithm based on the selected noise threshold.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/057629

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04N7/26 G01S13/90 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)

G01S H04N G06T

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, INSPEC, COMPENDEX, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HANQIANG LIU ET AL: "SAR Image Compression Using Bandelets and SPIHT" RADAR, 2006. CIE '06. INTERNATIONAL CONFERENCE ON, IEEE, PI, 1 October 2006 (2006-10-01), pages 1-4, XP031073472 ISBN: 978-0-7803-9582-4 Section III.A abstract ----- -/--	1-10



Further documents are listed in the continuation of Box C.



See patent family 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

12 September 2008

Date of mailing of the international search report

25/09/2008

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

Colesanti, Carlo

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2008/057629

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PIETRO PERONA ET AL: "SCALE-SPACE AND EDGE DETECTION USING ANISOTROPIC DIFFUSION" IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE, IEEE SERVICE CENTER, LOS ALAMITOS, CA, US, vol. 12, no. 7, 1 July 1990 (1990-07-01), pages 629-639, XP000136967 ISSN: 0162-8828 abstract Sections III. and IV., pages 630-632 Section V., from the last (non-numbered) equations on page 633 to the end of the section. -----	1-10
A	GORMAN J D ET AL: "Assessing the impact of image compression on SAR automatic target detection and cuing" RADAR CONFERENCE, 1996., PROCEEDINGS OF THE 1996 IEEE NATIONAL ANN ARBOR, MI, USA 13-16 MAY 1996, NEW YORK, NY, USA, IEEE, US, 13 May 1996 (1996-05-13), pages 118-123, XP010164739 ISBN: 978-0-7803-3145-7 Section 2, page 119, lines 3-6 abstract -----	1-10
P,X	ALLEN JOSEF DEVAUGHN ET AL: "Anisotropic diffusion techniques on synthetic aperture radar data" PROCEEDINGS OF SPIE-THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING, SPIE, BELLINGHAM, WA; US, vol. 6547, 12 April 2007 (2007-04-12), pages 654703-1, XP002484224 the whole document -----	1-10
P,A	SARTOR KENNETH ET AL: "Preprocessing of SAR interferometric data using anisotropic diffusion filter" PROCEEDINGS OF SPIE-THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING, SPIE, BELLINGHAM, WA; US, vol. 6568, 10 April 2007 (2007-04-10), pages 1-12, XP002484722 the whole document -----	1-10