

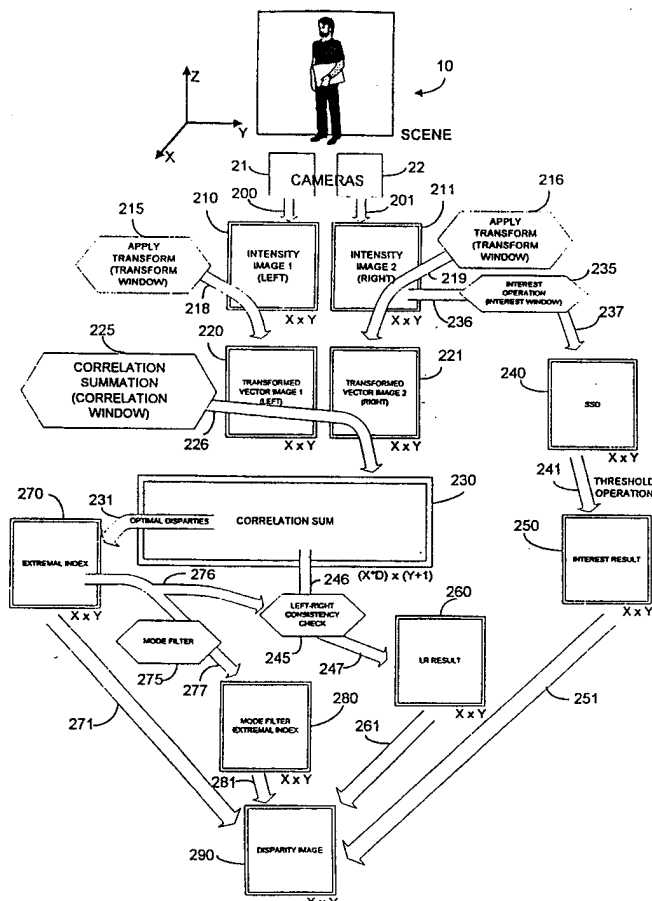
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US98/06675 (22) International Filing Date: 2 April 1998 (02.04.98) (30) Priority Data: 08/839,767 15 April 1997 (15.04.97) US (71) Applicant: INTERVAL RESEARCH CORPORATION [US/US]; Building C, 1801 Page Mill Road, Palo Alto, CA 94304 (US). (72) Inventors: WOODFILL, John, Iselin; 777 Rhode Island Street #3, San Francisco, CA 94107 (US). BAKER, Henry, Harlyn; 414 Paco Drive, Los Altos, CA 94024 (US). VON HERZEN, Brian; 675 Fairview Drive #246, Carson City, NV 89701 (US). ALKIRE, Robert, Dale; 1448 Pinehurst Drive, San Jose, CA 95118 (US). (74) Agents: SALTER, James, H. et al.; Blakely, Sokoloff, Taylor & Zafman LLP, 7th floor, 12400 Wilshire Boulevard, Los Angeles, CA 90025 (US).		(81) Designated States: AL, AM, AT, AT (Utility model), AU (Petty patent), AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> (88) Date of publication of the international search report: 18 February 1999 (18.02.99)

(54) Title: DATA PROCESSING SYSTEM AND METHOD FOR DETERMINING AND ANALYZING CORRESPONDENCE INFORMATION FOR A STEREO IMAGE

(57) Abstract

A powerful, scalable, and reconfigurable image processing system and method for processing stereo image data is described. A general purpose, reconfigurable engine with toroidal topology, distributed memory, and wide bandwidth I/O is described for solving real applications at real-time speeds. The reconfigurable image processing system can be optimized to efficiently perform specialized computations, such as real-time video and audio processing. This reconfigurable image processing system provides high performance via high computational density, high memory bandwidth, and high I/O bandwidth. Generally, the reconfigurable image processing system and its control structure include a homogeneous array of 16 field programmable gate arrays (FPGA) and 16 static random access memories (SRAM) arranged in a partial torus configuration (Fig. 46). The reconfigurable image processing system also includes a PCI bus interface chip, a clock control chip, and a datapath chip. It can be implemented in a single board. It receives data from its external environment, computes correspondence, and uses the results of the correspondence computations for various post-processing, industrial applications. The reconfigurable image processing system determines correspondence by using non-parametric local transforms followed by correlation. These non-parametric local transforms include the census, and rank transforms. Other embodiments involve a combination of correspondence, rectification, a left-right consistency check, and the application of an interest operator.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/06675

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : G06K 9/00, 9/64; H04N 13/00, 13/02; G06T 7/60; G06F 17/15

US CL : 382/154,278,303,304; 348/47; 364/728.05

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)

U.S. : 382/154, 278, 303, 304, 302, 106; 348/47, 46, 42, 43; 364/728.05, 728.03

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.
X	US 5,454,064 A (CASTELAZ) 26 SEPTEMBER 1995, SUMMARY.	1-2
A	US 4,905,081 A (MORTON) 27 FEBRUARY 1990, ABSTRACT.	1-2
A	US 5,179,441 A (ANDERSON ET AL) 12 JANUARY 1993, ABSTRACT.	1-2
A, P	US 5,652,616 A (CHEN ET AL) 29 JULY 1997, ABSTRACT.	1-2
A, P	US 5,719,954 A (ONDA) 17 FEBRUARY 1998, ABSTRACT.	1-2
A, P	US 5,727,078 A (CHUPEAU) 10 MARCH 1998, ABSTRACT.	1-2

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A, E	US 5,767,922 A (ZABIH et al) 16 June 1998, abstract.	1-2
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