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[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR SUPER-RESOLUTION OF IMAGES

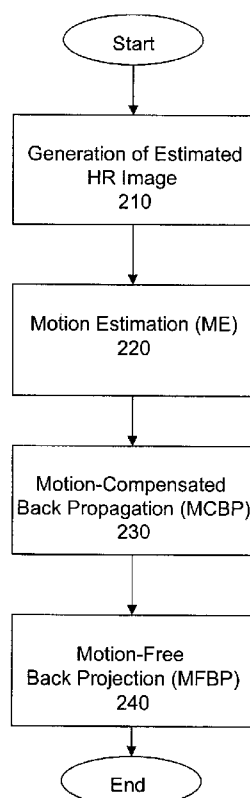


Figure 2

(57) Abstract: A method to generate super-resolution images using a sequence of low resolution images is disclosed. The method includes generating an estimated high resolution image, motion estimating between the estimated high resolution image and comparison images from the sequence of low resolution images, motion-compensated back projecting, and motion-free back projecting that results in a super resolved image. A corresponding system for generating super-resolution images includes a high resolution image estimation module, a motion estimating module, a motion-compensated back projection module, a motion-free back projection module, an input interface, and an output interface.

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A. CLASSIFICATION OF SUBJECT MATTER IPC: <i>G06T 3/40</i> (2006.01), <i>G06T 7/20</i> (2006.01), <i>H04N 7/015</i> (2006.01) 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: <i>G06T 3/40</i> (2006.01), <i>G06T 7/20</i> (2006.01), <i>H04N 7/015</i> (2006.01)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used) Databases: Delphion USPTO, Espacenet, Canadian Patent Database, IEEE, Patentscope, Google. key words: super, resolution, image, pixels, interpolation, motion, enhance, spatial, filtering, scale, processing, frame, vectors, reference, target, estimation, and related words.		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008/0018788 A1 (Zhou et al.), 24 January 2008 (24-01-2008). Entire Document.	1 to 15
A	US 7,420,592 B2 (Freeman), 02 September 2008 (02-09-2008). Entire Document.	1 to 15
A	US 2007/0071362 A1 (Milanfar et al.), 29 March 2007 (29-03-2007). Entire Document.	1 to 15
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A	Freeman W.T, Jones T.R, Pasztor E.C, "Examples-Based Super-Resolution", Image-based, Modeling, Rendering, and Lighting, March/April 2002. Entire Document.	1 to 15
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 application or patent 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 09 July 2009 (09-07-2009)	Date of mailing of the international search report 6 August 2009 (06-08-2009)	
Name and mailing address of the ISA/CA Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001-819-953-2476	Authorized officer Enji Al-Saber 819- 934-5142	

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	Yido Koo, Wonchan Kim, " <i>An image Resolution Enhancing Technique using Adaptive Sub-Pixel Interpolation for Digital Still Camera System</i> ", IEEE Transactions on Consumer Electronics, Volume 45, No. 1, February 1999. Entire Document.	1 to 15
A	Farsiu S, Robinson D, Elad M, Milanfar P, "Advances and Challenges in Super-Resolution", International Journal of Imaging Systems and Technology, Vol. 4, no. 2, pp. 47 to 57, August 2004. Entire Document.	1 to 15

INTERNATIONAL SEARCH REPORT
Information on patent family members

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