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[Continued on next page]

(54) Title: MOBILE CAMERA LOCALIZATION USING DEPTH MAPS

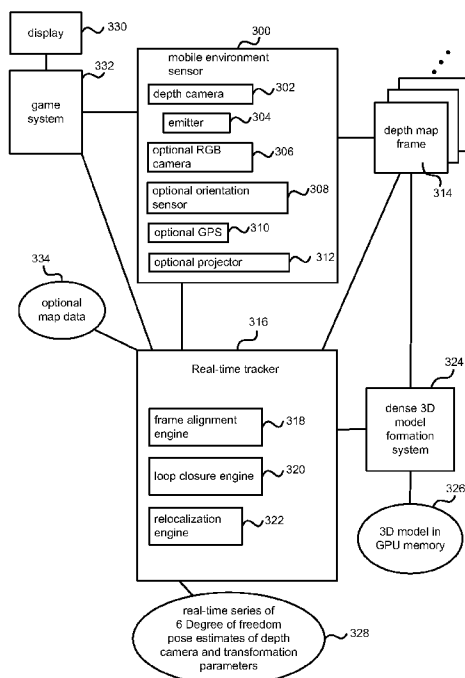


Fig. 3

(57) Abstract: Mobile camera localization using depth maps is described for robotics, immersive gaming, augmented reality and other applications. In an embodiment a mobile depth camera is tracked in an environment at the same time as a 3D model of the environment is formed using the sensed depth data. In an embodiment, when camera tracking fails, this is detected and the camera is relocalized either by using previously gathered keyframes or in other ways. In an embodiment, loop closures are detected in which the mobile camera revisits a location, by comparing features of a current depth map with the 3D model in real time. In embodiments the detected loop closures are used to improve the consistency and accuracy of the 3D model of the environment.



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SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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International application No.
PCT/US2012/020681**A. CLASSIFICATION OF SUBJECT MATTER***H04N 13/02(2006.01)i, H04N 5/225(2006.01)i, G03B 35/00(2006.01)i*

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)

H04N 13/02; G01P 15/00; H04N 7/00; G05B 19/04

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: camera, local, 3D

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 7627447 B2 (MARSH JOSEPH C. et al.) 01 December 2009 See abstract, column10 line34 - column11 line38, figure 9, and claim 1.	1-10
A	US 2010-0094460 A1 (CHOI KI-WAN et al.) 15 April 2010 See abstract, paragraphs [0056]-[0066], figure 6, and claim 1.	1-10
A	US 2002-0069013 A1 (NASSIR NAVAB et al.) 06 June 2002 See abstract, paragraphs [0025]-[0028], figure 5, and claim 1.	1-10



Further documents are listed in the continuation of Box C.



See patent family annex.

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"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

27 AUGUST 2012 (27.08.2012)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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PCT/US2012/020681

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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