Disclosed are various embodiments for determining a pose of a mobile device by analyzing a digital image captured by at least one imaging device to identify a plurality of regions in a fiducial marker indicative of a pose of the mobile device. A fiducial marker may comprise a circle-of-dots pattern, the circle-of-dots pattern comprising an arrangement of dots of varied sizes. The pose of the mobile device may be used to generate a three-dimensional reconstruction of an item subject to a scan via the mobile device.
A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06K 9/00 (2014.01)
CPC - G06T 7/0075

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(8): G06K 9/00 (2014.01)
CPC: G06T 7/0075

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

USPC: 382/154; 382/100; 702/95; 702/153 (Keyword limited; terms below); IPC(8): G06K 9/00 (2014.01) (Keyword limited; terms below)
CPC: G06T 7/0075; G06T 2207/10012; H04N 13/0239; H04N 2013/0081; G06T 7/0022 (Keyword limited; terms below)

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

PatBase; Google (Scholar, Patents, Web)

Terms used: mobile 3d scan fiducial pose detection camera lens model distortion otscan ear marker id number

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 2010/0092079 A1 (ALLER), 15 April 2010 (15.04.2010), entire document, especially Abstract; para [0072], [0099], [01 15], [0125], [0129], [0142], [0145], [0204], [0206], [0210], [0273]-[0274]</td>
<td>1-3, 6-8, 10-12, 15-16</td>
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<tr>
<td>Y</td>
<td>US 6,072,496 A (GUENTER et al.), 06 June 2000 (06.06.2000), entire document, especially Abstract; col 15, ln 1-10</td>
<td>4-5, 9, 13-14, 17-20</td>
</tr>
<tr>
<td>Y</td>
<td>US 2012/0281071 A1 (BERGMAN et al.), 08 November 2012 (08.11.2012), entire document, especially Abstract; para [0027]-[0028], [0032], [0049], [0067]</td>
<td>9, 17-20</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

* 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: 10 December 2014 (10.12.2014)

Date of mailing of the international search report: 09 J A N 2015

Authorized officer: Lee W. Young

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PCT OSP: 571-272-7774