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- (71) **Applicant** (for all designated States except US): **LiberoVision AG** [CH/CH]; Technoparkstrasse 1, CH-8005 Zürich (CH).
- (72) **Inventors; and**
- (75) **Inventors/Applicants** (for US only): **POPA, Tiberiu** [CA/CH]; Dolderstrasse 63, CH-8032 Zürich (CH). **GERMANN, Marcel** [CH/CH]; Trottenstrasse 41, CH-8037 Zürich (CH). **KEISER, Richard** [CH/CH]; Sackzelg 36, CH-8047 Zürich (CH). **GROSS, Markus** [CH/CH]; Poststrasse 1, CH-8610 Uster (CH). **ZIEGLER, Remo** [CH/CH]; Wilstrasse 10, CH-8610 Uster (CH).
- (74) **Agent:** **FREI PATENTANWALTSBURÖ AG**; Postfach 1771, CH-8032 Zürich (CH).
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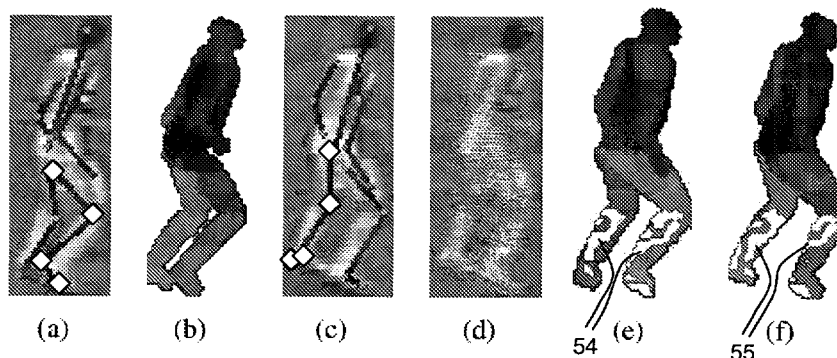
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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- with international search report (Art. 21(3))
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- (88) **Date of publication of the international search report:**
21 March 2013

(54) **Title:** SILHOUETTE-BASED POSE ESTIMATION**Fig. 8**

(57) **Abstract:** Estimating a pose of an articulated 3D object model (4) by a computer is done by • obtaining a sequence of source images (10) and therefrom corresponding source image segments (13) with objects (14) separated from the image background; • matching such a sequence (51) with sequences (52) of reference silhouettes (13'), determining one or more selected sequences of reference silhouettes (13') forming a best match; • for each of these selected sequences of reference silhouettes (13'), retrieving a reference pose that is associated with one of the reference silhouettes (13'); and • computing an estimate of the pose of the articulated object model (4) from the retrieved reference pose or poses. The result of these steps is an initial pose estimate, which then can be used in further steps, for example, for maintaining local consistency between pose estimates from consecutive frames, and global consistency over a longer sequence of frames.

INTERNATIONAL SEARCH REPORT

International application No

PCT/CH2012/000100

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06K9/00 G06T7/00
ADD.

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)

G06K 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 practicable, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	M. Dimitrijevic ET AL: "Human Body Pose Recognition Using Spatio-Temporal Templates", Workshop on Modeling People and Human Interaction at the ICCV 2005, 1 January 2005 (2005-01-01), XP055033869, Beijing, China Retrieved from the Internet: URL:http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.175.1795&rep=rep1&type=pdf&ei=cesPUITXIpHUsGaer4HoCg&usg=AFQjCNF_AySx-jfqExk4CetNEf1ih9tyZw [retrieved on 2012-07-25] the whole document ----- -/--	1-3



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 application or patent but published on or after the international filing date

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"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

27 July 2012

Date of mailing of the international search report

15/01/2013

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Neubüser, Bernhard

INTERNATIONAL SEARCH REPORT

International application No

PCT/CH2012/000100

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GERMANN M ET AL: "Articulated Billboards for Video-based Rendering", COMPUTER GRAPHICS FORUM, WILEY-BLACKWELL PUBLISHING LTD, GB , vol. 29, no. 2 1 May 2010 (2010-05-01), pages 585-594, XP002615344, ISSN: 0167-7055, DOI: 10.1111/J.1467-8659.2009.01628.X Retrieved from the Internet: URL:http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8659.2009.01628.x/pdf [retrieved on 2010-12-16] the whole document	1-7, 18-20
X,P	MARCEL GERMANN ET AL: "Space-Time Body Pose Estimation in Uncontrolled Environments", 3D IMAGING, MODELING, PROCESSING, VISUALIZATION AND TRANSMISSION (3DIMPVT), 2011 INTERNATIONAL CONFERENCE ON, IEEE, 16 May 2011 (2011-05-16), pages 244-251, XP031896491, DOI: 10.1109/3DIMPVT.2011.38 ISBN: 978-1-61284-429-9 the whole document	1-20
A	ONG E J ET AL: "Viewpoint invariant exemplar-based 3D human tracking", COMPUTER VISION AND IMAGE UNDERSTANDING, ACADEMIC PRESS, US, vol. 104, no. 2-3, 1 November 2006 (2006-11-01), pages 178-189, XP024917696, ISSN: 1077-3142, DOI: 10.1016/J.CVIU.2006.08.004 [retrieved on 2006-11-01] abstract	1-7, 18-20

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CH2012/000100

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-7(completely); 18-20(partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7(completely); 18-20(partially)

A sequence based method for estimating the pose of an articulated object.

2. claims: 8-17(completely); 18-20(partially)

A method of optimizing an already determined estimate of a pose of an articulated object
