



(51) International Patent Classification:

A61B 34/20 (2006.01) G06T 3/00 (2006.01)
G06T 7/10 (2017.01) G06T 15/00 (2011.01)
G06T 11/00 (2006.01) G06T 17/00 (2006.01)

(21) International Application Number:

PCT/SG2018/050637

(22) International Filing Date:

28 December 2018 (28.12.2018)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10201710888P 28 December 2017 (28.12.2017) SG

(71) Applicants: **CHANGI GENERAL HOSPITAL PTE LTD** [SG/SG]; 31 Third Hospital Avenue, #03-03 Bowyer Block, Singapore 168753 (SG). **SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN** [SG/SG]; 8 Somapah Road, Singapore 487372 (SG).

(72) Inventors: **NG, Foo Cheong**; c/o Changi General Hospital Pte Ltd, 31 Third Hospital Avenue, #03-03 Bowyer Block, Singapore 168753 (SG). **LIM, Sey Kiat Terence**; c/o Changi General Hospital Pte Ltd, 31 Third Hospital Avenue, #03-03 Bowyer Block, Singapore 168753 (SG).

KARUPPPASAMY, Subburaj; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). **TAN, U-Xuan**; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). **CHEN, Lujie**; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). **FOONG, Shaohui**; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). **YANG, Liangjing**; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). **LI, Hsieh-Yu**; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). **PARANAWITHANA, Ishara Chaminda Kariyawasam**; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). **CHAU, Zhong Hoo**; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG). **MOOKIAH, Muthu Rama Krishnan**; c/o Singapore University of Technology and Design, 8 Somapah Road, Singapore 487372 (SG).

(74) Agent: **DONALDSON & BURKINSHAW LLP**; 24 Raffles Place, #15-00 Clifford Centre, Singapore 048621 (SG).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,

(54) Title: MOTION COMPENSATION PLATFORM FOR IMAGE GUIDED PERCUTANEOUS ACCESS TO BODILY ORGANS AND STRUCTURES

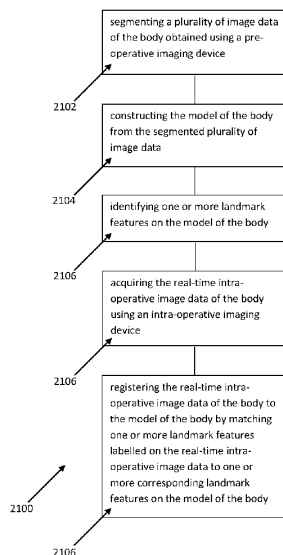


FIG. 21

(57) Abstract: A method and a system for registering real-time intra-operative image data of a body to a model of the body, the method comprising, segmenting a plurality of image data of the body obtained using a pre-operative imaging device; constructing the model of the body from the segmented plurality of image data; identifying one or more landmark features on the model of the body; acquiring the real-time intra-operative image data of the body using an intra-operative imaging device; and registering the real-time intra-operative image data of the body to the model of the body by matching one or more landmark features labelled on the real-time intra-operative image data to one or more corresponding landmark features on the model of the body, wherein the one or more landmark features comprises a superior and an inferior pole of the body.

CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,
KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA,
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.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))