(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
04 September 2025 (04.09.2025)

WIPO | PCT

(10) International Publication Number
WO 2025/179334 A1

(51) International Patent Classification:
A61B 34/10 (2016.01) *G06T 7/33* (2017.01)
A61B 6/03 (2006.01) *G06T 19/20* (2011.01)
G06T 7/00 (2017.01)

(21) International Application Number:
PCT/AU2025/050165

(22) International Filing Date:
26 February 2025 (26.02.2025)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2024900457 26 February 2024 (26.02.2024) AU

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(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, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA,

(54) Title: METHOD AND SYSTEM FOR SURGICAL PLANNING

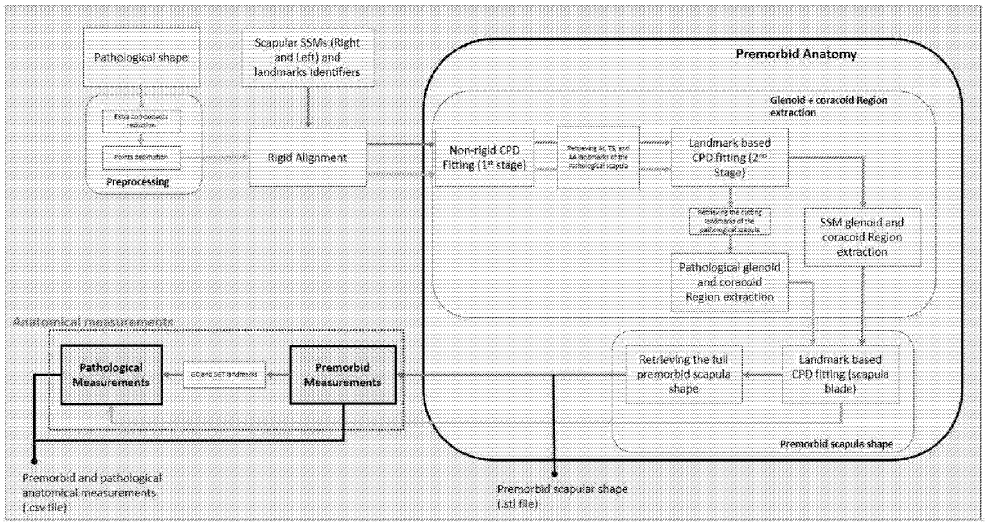


FIGURE 7

(57) Abstract: A computer implemented method of generating a premorbid visualization model of an actual morbid body part, comprising the steps of: accessing a computer memory, the computer memory storing statistical shape model (SSM) of a body part built based on training set data and corresponding to an actual body part; retrieving identifiers associated with pre-defined landmarks of the body part from the statistical shape model; accessing data derived from the morbid body part of the patient to form a geometric model that represents the three-dimensional shape of the body part; performing rigid alignment of the geometrical model of the morbid body part and of the mean shape (MS) of the statistical shape model (SSM) to obtain a rigidly aligned geometrical models of the morbid body part and the SSM;utilizing the identifiers for extracting damaged portions from the geometrical model of the morbid body part and its anatomical equivalent in the rigidly aligned model of the mean shape (MS) to form extracted geometrical model of the morbid body

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NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UY, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) **Designated States** *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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))*

— *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*

part and extracted model of the mean shape (MS) respectively; the damaged portions representing damaged regions of the morbid body part wherein the extracted geometrical model of the morbid body part and the extracted model of the mean shape (MS) represent non-damaged regions of the body part respectively; marginalizing the statistical shape model (SSM) of the body part to the extracted model of the mean shape (MS) to obtain a marginalized SSM; and;non-rigidly fitting the marginalized SSM with the extracted geometric model of the morbid body part to generate a premorbid visualization model of the morbid body part.