(12) International Application Status Report

Received at International Bureau: 25 March 2018 (25.03.2018)
Information valid as of: 20 August 2018 (20.08.2018)
Report generated on: 22 November 2019 (22.11.2019)

(10) Publication number:
WO2018/165478

(43) Publication date:
13 September 2018 (13.09.2018)

(26) Publication language:
English (EN)

(21) Application Number:
PCT/US2018/021614

(22) Filing Date:
08 March 2018 (08.03.2018)

(25) Filing language:
English (EN)

(31) Priority number(s):
62/468,961 (US)

(31) Priority date(s):
09 March 2017 (09.03.2017)

(31) Priority status:
Priority document received (in compliance with PCT Rule 17.1)

(51) International Patent Classification:
A61B 6/00 (2006.01); **G06T 7/00** (2017.01); ***G06T 7/55*** (2017.01); **G06T 17/00** (2006.01)

(71) Applicant(s):
CATHWORKS LTD. [US/US]; 3 Rapaport Kfar Saba 4465141 (IL) *(for all designated states)*

(72) Inventor(s):
HARISH, Omri; 15 Arbel Street 4486200 Zur Yigal (IL)
SHILON, Ofek; 4 Halapid Street 4439104 Kfar-Saba (IL)
LAVI, Guy; P.O. Box 245 4069500 Moshav Mishmeret (IL)

(74) Agent(s):
CULLMAN, Louis, C.; K&L Gates LLP 1 Park Plaza Twelfth Floor Irvine, CA 92604 (US)

(54) Title (EN): SHELL-CONSTRAINED LOCALIZATION OF VASCULATURE

(54) Title (FR): LOCALISATION À CONTRAINTE DE COQUE DE SYSTÈME VASCULAIRE

(57) Abstract:

(EN): Methods of and systems for reconstructing a vascular tree shape from vascular segments imaged in a single source 2-D projection image are described. A structuring shape comprising spatial positions of reference anatomical elements is defined, such as vascular segments in the definition of a 3-D surface model corresponding to a surface defined by an anatomical structure such as a body organ (e.g., heart). The 3-D surface model is used to create a 3-D model of anatomical elements (e.g., additional vascular segments of a cardiac vasculature) imaged in a source 2-D projection image, by back-projection to the 3-D surface model. The 3-D surface model is optionally aligned by first aligning the source 2-D projection image to the structuring shape. In some embodiments, the source 2-D projection image is registered to the 3-D surface model through the structuring shape by the source image's initial use in defining the structuring shape.

(FR): L'invention concerne des procédés et des systèmes permettant de reconstruire une forme d'arbre vasculaire à partir de segments vasculaires imagés dans une image unique de projection 2D source. Une forme de structuration comprenant les positions spatiales d'éléments anatomiques de référence est définie, telle que des segments vasculaires dans la définition d'un modèle de surface 3D correspondant à une surface définie par une structure anatomique telle qu'un organe corporel (par exemple, le cœur). Le modèle de surface 3D est utilisé pour créer un modèle 3D d'éléments anatomiques (par exemple, des segments vasculaires supplémentaires d'un système vasculaire cardiaque) imagé dans une image de projection 2D source, par rétroprojection sur le modèle de surface 3D. Le modèle de surface 3D est éventuellement aligné par un premier alignement de l'image de projection 2D source sur la forme de structuration. Selon certains modes de réalisation, l'image de projection 2D source est enregistrée sur le modèle de surface 3D par l'intermédiaire de la forme de structuration par l'utilisation initiale de l'image source dans la définition de la forme de structuration.

International search report:
Received at International Bureau: 24 May 2018 (24.05.2018) [US]

International Report on Patentability (IPRP) Chapter II of the PCT:
Not available

(81) Designated States:
AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, 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
European Patent Office (EPO) : 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
African Intellectual Property Organization (OAPI) : BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG
African Regional Intellectual Property Organization (ARIPO) : BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW
Eurasian Patent Organization (EAPO) : AM, AZ, BY, KG, KZ, RU, TJ, TM