

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
12 December 2013 (12.12.2013)



(10) International Publication Number
WO 2013/184070 A8

(51) International Patent Classification:
A61B 3/12 (2006.01)

(21) International Application Number:
PCT/SG2013/000235

(22) International Filing Date:
5 June 2013 (05.06.2013)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
201204125-7 5 June 2012 (05.06.2012) SG

(71) Applicants: **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10 Connexis, Singapore 138632 (SG). **SINGAPORE HEALTH SERVICES PTE LTD** [SG/SG]; 31 Third Hospital Avenue, #03-03 Bowyer Block, Singapore 168753 (SG).

(72) Inventors: **WONG, Wing Kee, Damon**; c/o PKM, Institute for Infocomm Research, 1 Fusionopolis Way, #21-01 Connexis, South Tower, Singapore 138632 (SG). **CHENG, Xiangang**; c/o PKM, Institute for Infocomm Research, 1 Fusionopolis Way, #21-01 Connexis, South Tower, Singapore 138632 (SG). **LIU, Jiang**; c/o PKM, Institute for Infocomm Research, 1 Fusionopolis Way, #21-01 Connexis, South Tower, Singapore 138632 (SG). **TANG, Ngan Meng**; c/o PKM, Institute for Infocomm Research, 1 Fusionopolis Way, #21-01 Connexis, South Tower, Singapore 138632 (SG). **LEE, Beng Hai**; c/o

PKM, Institute for Infocomm Research, 1 Fusionopolis Way, #21-01 Connexis, South Tower, Singapore 138632 (SG). **YIN, Fengshou**; c/o PKM, Institute for Infocomm Research, 1 Fusionopolis Way, #21-01 Connexis, South Tower, Singapore 138632 (SG). **BHARGAVA, Mayuri**; c/o Singapore Eye Research Institute, #05-00, SNEC Building, 11 Third Hospital Avenue, Singapore 168751 (SG). **CHEUNG, Gemmy**; c/o Singapore Eye Research Institute, #05-00, SNEC Building, 11 Third Hospital Avenue, Singapore 168751 (SG). **WONG, Tien Yin**; c/o Singapore Eye Research Institute, #05-00, SNEC Building, 11 Third Hospital Avenue, Singapore 168751 (SG).

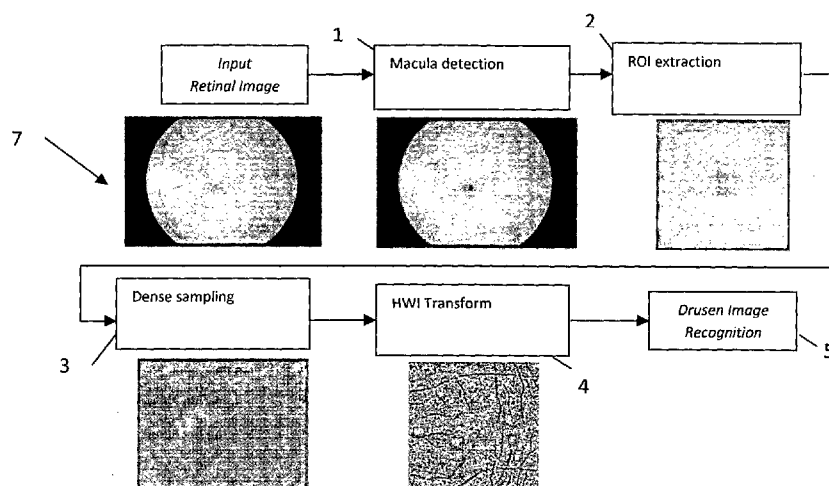
(74) Agent: **WATKIN, Timothy, Lawrence, Harvey**; Marks & Clerk Singapore LLP, Tanjong Pagar, P O Box 636, Singapore 910816 (SG).

(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, 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, 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, PA, 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.

(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, SZ, TZ,

[Continued on next page]

(54) Title: A DRUSEN LESION IMAGE DETECTION SYSTEM



(57) Abstract: A method is proposed for automatically analysing a retina image, to identify the presence of drusen which is indicative of age-related macular degeneration. The method proposes dividing a region of interest including the macula centre into patches, obtaining a local descriptor of each of the patches, reducing the dimensionality of the local descriptor by comparing the local descriptor to a tree-like clustering model and obtaining transformed data indicating the identity of the cluster. The transformed data is fed into an adaptive model which generates data indicative of the presence of drusen in the retinal image. Furthermore, the transformed data can be used to obtain the location of the drusen within the image.



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))*

(48) Date of publication of this corrected version:

11 December 2014

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

(15) Information about Correction:

see Notice of 11 December 2014