

(12) International Application Status Report

Received at International Bureau: 24 October 2015 (24.10.2015)

Information valid as of: 14 April 2016 (14.04.2016)

Report generated on: 15 June 2021 (15.06.2021)

(10) Publication number:

WO2016/057781

(43) Publication date:

14 April 2016 (14.04.2016)

(26) Publication language:

English (EN)

(21) Application Number:

PCT/US2015/054669

(22) Filing Date:

08 October 2015 (08.10.2015)

(25) Filing language:

English (EN)

(31) Priority number(s):

62/061,320 (US)

(31) Priority date(s):

08 October 2014 (08.10.2014)

(31) Priority status:

Priority document received (in compliance with PCT Rule 17.1)

(51) International Patent Classification:

A61B 5/0205 (2006.01)

(71) Applicant(s):

THE UNIVERSITY OF FLORIDA RESEARCH FOUNDATION, INC. [US/US]; 233 Grinter Hall Gainesville, FL 32611 (US)
(for all designated states)

(72) Inventor(s):

LIN, Jenshan; 910 SW 105th Terrace Gainesville, FL 32607 (US)
WEI, Changyu; 2330 SW Williston Road Apt. 1925 Gainesville, FL 32608 (US)

(74) Agent(s):

SCHOEN, Randy R.; Thomas | Horstemeyer LLP 400 Interstate North Parkway, SE Suite 1500 Atlanta, GA 30339 (US)

(54) Title (EN): METHOD AND APPARATUS FOR NON-CONTACT FAST VITAL SIGN ACQUISITION BASED ON RADAR SIGNAL

(54) Title (FR): PROCÉDÉ ET APPAREIL POUR L'ACQUISITION DE SIGNES VITAUX RAPIDE SANS CONTACT SUR LA BASE D'UN SIGNAL RADAR

(57) Abstract:

(EN): Various examples are provided for non-contact vital sign acquisition. Information can be provided regarding vibrations of a target using a radar signal such as, e.g., non-contact vital sign measurement. Examples include estimation of heart rate, change in heart rate, respiration rate, and/or change in respiration rate, for a human or other animal. Implementations can produce one or both rates of vibration and/or change in one or both rates of vibration for a target other than an animal or human experiencing two vibrations at the same time, such as a motor, a vehicle incorporating a motor, or another physical object. Some implementations can estimate the respiration movement in the radar baseband output signal. The estimated respiration signal can then be subtracted from radar signals in the time domain and, optionally, can be further enhanced using digital signal processing techniques, to produce an estimate of the heartbeat pulses.

(FR): La présente invention concerne, dans plusieurs exemples, l'acquisition de signes vitaux sans contact. Des informations concernant des vibrations d'une cible peuvent être fournies à l'aide d'un signal radar, telles que par exemple une mesure de signes vitaux sans contact. Les exemples comprennent l'estimation du débit cardiaque, le changement du rythme cardiaque, la fréquence respiratoire, et/ou le changement de la fréquence respiratoire, pour un être humain ou un autre animal. Certains modes de réalisation peuvent produire une ou deux vitesses de vibration et/ou un changement de l'une ou des deux vitesses de vibration pour une cible autre qu'un animal ou un être humain subissant deux vibrations en même temps, telles qu'un moteur, un véhicule incorporant un moteur, ou un autre objet physique. Certains modes de réalisation de l'invention permettent d'estimer le mouvement respiratoire dans le signal de sortie de bande de base radar. Le signal respiratoire estimé peut ensuite être soustrait des signaux radar dans le domaine temporel et, éventuellement, être en outre amélioré à l'aide de techniques de traitement de signal numérique, pour produire une estimation des impulsions de battement de cœur.

International search report:

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, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, 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

Declarations:

Declaration made as applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate

Declaration made as applicant's entitlement, as at the international filing date, to claim the priority of the earlier application, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii))