



(51) International Patent Classification:

A61G 5/00 (2006.01) G06T 7/10 (2017.01)
G05D 1/00 (2024.01)

(21) International Application Number:

PCT/SG2023/050229

(22) International Filing Date:

05 April 2023 (05.04.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10202203787P 12 April 2022 (12.04.2022) SG

(71) Applicant: **NANYANG TECHNOLOGICAL UNIVERSITY** [SG/SG]; 50 Nanyang Avenue, Singapore 639798 (SG).

(72) Inventors: **ANG, Wei Tech**; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG).

LEONG, Marcus Khee Ing; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG).
GARG, Neha Priyadarshini; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG).
PANG, Wee Ching; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG). **LI, Lei**; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG). **RAMANATHAN, Manoj**; c/o Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798 (SG).

(74) Agent: **CHINA SINDA INTELLECTUAL PROPERTY PTE. LTD.**; 47 Scotts Road, #13-03, Goldbell Towers, Singapore 228233 (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, 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,

(54) Title: A SYSTEM AND METHOD OF WHEELCHAIR DOCKING

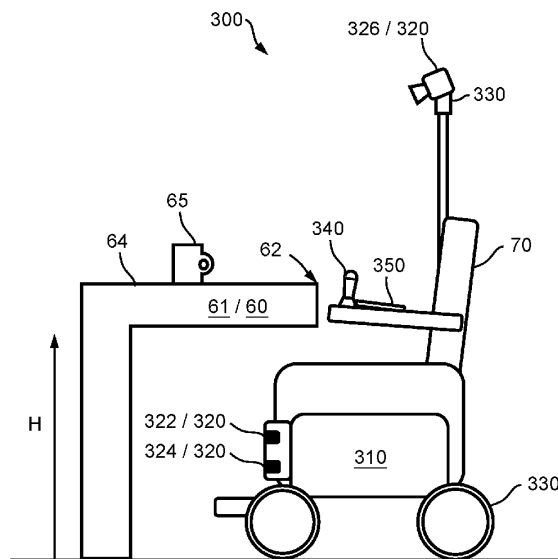


FIG. 2

(57) Abstract: A system and method of docking a wheelchair relative to an object such as a table. The method includes converting a user-selected 2D point in a 2D image of a scene into a 3D point in a 3D point cloud of the scene. A first group of edges is determined from the 3D point cloud based on the 3D point. The method includes defining an intermediate dock pose and an approximated reference edge. The method includes determining a second group of edges from the 3D point cloud and at least one potential reference edge. The method includes determining a dock pose based on one of the at least one potential reference edge and moving the wheelchair towards the dock pose.

KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY,
MA, MD, MG, MK, MN, MU, 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, ST, SV, SY, TH,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, 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))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

30 November 2023 (30.11.2023)