2022 School of EECMS Summer Internship Application Form

Main Supervisor	Yifei Ren
Is the main supervisor an ECR/MCR?	YES
Other supervisors (if applicable)	Siavash Khaksar, Dowon Kim, Hanieh Bakhshayesh
Project Title	Version Guiding System for Semi-smart Wheelchair
Duration of project (select between 4 and eight weeks)	Eight weeks
Project Description	This project is part of the collaborations with Glide and Fiona Stanley Hospital. The overall project aims to develop a semi-smart wheelchair which is capable of: 1. Accepting voice command 2. Wireless Charging 3. Self-navigation to indoor locations To achieve the third function, we need a version guiding system based on stereo camera. The intern will have to firstly implement a 2D/3D object detection algorithm for common items in household (Milestone 1). Then, deploy a computer version algorithm [1] to fetch distance and angle based on the centre points returned by object detection algorithm (Milestone 2). Lastly, the intern will use VSLAM [2] to create a digital mapping for the indoor environment (Milestone 3). The electrical wheelchair has been supported by our partner Glide. The required hardware will only be a mounting mechanism and stereo cameras. This project will use open-sources software for development. This project is aiming to complete at least Milestone 1 and 2. The Milestone 1 may require a custom dataset which is time-consuming. Thus, Milestone 3 may not be able to be delivered. Reference: [1] Salman, Y.D., Ku-Mahamud, K.R. and Kamioka, E., “Distance measurement for self-driving cars using stereo camera.” In International Conference on Computing and Informatics, 2017, April, Vol. 1, No. 105, pp. 235-242. [2] N. Karlsson, E. di Bernardo, J. Ostrowski, L. Goncalves, P. Pirjanian and M. E. Munich, "The vSLAM Algorithm for Robust Localization and Mapping," Proceedings of the 2005 IEEE International Conference on Robotics and Automation, 2005, pp. 24-29.