Ruihua Han

Research Assistant in the Department of Computer Science and Engineering
Southern University of Science and Technology, Shen Zhen, China
Phone: (+86)18576494639 Email: hanruihua@stu.xmu.edu.cn
Personal page: https://hanruihua.info/

EDUCATION

Master's Degree of Engineering **09/2014-06/2017**
Xiamen University
Major: Microelectronics and Solid State Electronics

Bachelor's Degree of Engineering **09/2010-06/2014**
Wuhan University of Technology
Major: Industrial Equipment and Control Engineering

RESEARCH EXPERIENCE

Navigation of Self-driving Campus Bus on Road **08/2017-present**

- This research aims to develop a self-driving system for the campus bus with exteroceptive sensors including LIDARs and cameras to perform autonomous navigation on the road.
- *Responsibilities*: Developing the algorithm for localization of the bus with binocular camera based on ORB−SLAM and filter algorithm such as EKF, PF.

Multi-Robot Localization in Featureless Environment **04/2018-present**

- This research aims to localize a group of robots by the relative observation between two robots in a featureless environment where has no fixed landmark.
- *Responsibilities*: Developing the decentralized algorithm based on EKF which fuses the odometry and relative observation derived from the camera to perform the cooperative localization.

Design of Micro Piezoelectric Ultrasound Pump **09/2015-06/2017**

- This research aims to design an ultrasound pump model based on piezoelectric material which can generate a traveling wave to drive fluid when AC voltage applied.
- *Responsibilities*: Designed and optimized the detailed size of the pump model to obtain a higher performance by the fluid analysis using ANSYS simulation.

Design of Micro Piezoelectric Accelerator **09/2014-09/2015**

- This research aims to design an accelerator which can detect the charge generated from the piezoelectric material by the vibration of the mass to calculate the corresponding acceleration.
- *Responsibilities*: Designed and optimized the detailed size of the accelerator model to obtain a higher performance by kinetic analysis and simulation with ANSYS.

PUBLICATIONS

- **Ruihua Han**, Shengduo Chen, Yasheng Bu, Zhijun Lyu, and Qi Hao, "Decentralized Cooperative Multi-Robot Localization with EKF" ICRA 2019. Submitted.
- Shuai Zhang, **Ruihua Han**, Wankuan Huang, Shuaijun Wang, and Qi Hao, "Linear Bayesian Filter based Low-cost UWB Systems for Indoor Mobile Robot Localization" SENSORS, 2018 IEEE. Accepted.
- **Ruihua Han**, Jianyan Wang, Mahui Xu, and Hang Guo. "Design of a tri-axial micro piezoelectric accelerometer" Symposium on Piezoelectricity, Acoustic Waves, and Device Applications (SPAWDA), 2016. pp. 66-70. IEEE, 2016.

- Hui Zhou, **Ruihua Han**, Mahui Xu, and Hang Guo. "Study of a piezoelectric accelerometer based on d33 mode" Symposium on Piezoelectricity, Acoustic Waves, and Device Applications (SPAWDA), 2016. pp. 61-65. IEEE, 2016
- Mahui Xu, Jianyan Wang, **Ruihua Han**, Hui Zhou, and Hang Guo. "Analytical and finite element analysis of a new tri-axial piezoelectric accelerometer." Symposium on Piezoelectricity, Acoustic Waves, and Device Applications (SPAWDA), 2016. pp. 71-75. IEEE, 2016.

WORK EXPERIENCE

Research Assistant **08/2017-present**

Southern University of Science and Technology

- Participated in *Self-driving Campus Bus* and *Multi-Robot Localization* projects.
- Served as the *Teaching Assistant* to teach the course *Intelligent Robot* about the *ROS navigation*.
- Wrote proposals to apply projects including *Self-driving Campus Bus (\$1500000), Open Datasets for Autonomous Transportation (\$600000)*.

Algorithm Engineer Intern **07/2016-09/2016**

DJI-Innovations

- Developed the flight control algorithm based on ROS to control the aerial vehicle (M100) move to the assigned place and perform the task of fetching target automatically.

CONTEST EXPERIENCE

2015 ABU Robocon China ***national first prize***

- This competition requires students to build a badminton robot which can compete with other robots built by other universities.
- *Responsibilities*: Designed and built the mechanical structure of the robot; programmed the code to control the brushless motor.

2016 National Robot Creative Design Contest ***national first prize***

- This competition requires students to design a robot with the theme of *Intelligent Robot*.
- *Responsibilities*: Designed and simulated a dental robot based on virtual force feedback technology using SolidWorks.

2016 RoboMaster Robotics Competition ***national second prize***

- This competition requires students to form a robotics team, and independently develop and produce a variety of robots to participate in a large-scale competition
- *Responsibilities*: Programmed the code on the STM32 platform to address the problems including CAN/serial port communication and control (PID) of robots.

2017 RoboMaster Robotics Competition ***national third prize***

- This competition requires students to form a robotics team, and independently develop and produce a variety of robots to participate in a large-scale competition
- *Responsibilities*: Developed the flight control algorithm based on ROS and DJI Onboard SDK to perform the task of grabbing ball.

GRADES AND SKILLS

- Master's GPA: 3.1
- Language: IELTS 6.5 (L6.0, R8.5, W5.5, S5.5)
- Programming Language: C/C++, Python
- Hardware: 3D printer, CNC, Lathe Machine
- Software: Matlab, latex, ANSYS, SolidWorks, AutoCAD
- Development Platform: Linux, ROS, STM32