

# Hengrui (Henry) Zhang

Email: hengruiz@andrew.cmu.edu

Phone: (412) 313 4476

Webpage: hengruizhang.com

## EDUCATION

### **Carnegie Mellon University**

Bachelor of Science in Mechanical Engineering; Additional Major: Robotics

Class of 2019

Master of Science in Robotics, School of Computer Science

Class of 2021

- GPA: 3.7/4.0

- Relevant Courses: Imperative Programming, Introduction to Computer Systems, Machine Learning, Computer Vision, Mathematical Foundations for Robotics, Robot Localization and Mapping, Dynamics System and Control, Mobile Robots, Robot Kinematics and Dynamics

## WORK EXPERIENCE

### **Team Explorer, Carnegie Mellon DARPA Subterranean Challenge Team**

Pittsburgh, PA

#### **Perception Software Team**

Summer 2019

- Developed a generalized calibration pipeline for multi-sensor perception payloads on multiple robots.
- Implemented a ROS driver for FLIR BOSON 640 thermal cameras that supports multiple functionalities (raw images, rectified images, camera info, camera reset).
- Trained multiple object detection networks on RGB and thermal datasets for artifact detection.
- Evaluated and deployed networks based on their accuracies and inference speeds on a Jetson AGX Xavier.

### **The Air Lab, The Robotics Institute, Carnegie Mellon University**

Pittsburgh, PA

#### **Mechatronics Intern**

Summer 2018

- Designed and built a sensor pod with high fidelity 3D reconstruction capabilities.
- Fabricated thermal camera calibration targets and performed thermal camera intrinsic parameters calibration.
- Conducted extrinsic parameters calibration between a 16-ring Velodyne Puck LiDAR and stereo RGB cameras.
- Implemented external hardware sensor triggering and time synchronization for the sensor pod.

### **Dorabot, Inc**

Shenzhen, China

#### **Mechanical Engineering Intern**

Summer 2017

- Designed and manufactured a mobile manipulator robot (MOMA) with multiple components and sensors, including LiDAR, motors, computer, batteries, etc.
- Collaborated with electrical and software engineers extensively to complete the project.

## PROJECT

### **Robotics Capstone Project**

Spring 2019

#### **Washbot, an autonomous driveway cleaning robot**

- Designed and assembled the mechanical structure of the robot.
- Integrated ORB-SLAM with robot's Intel Realsense RGBD camera for state estimation.
- Maintained system development documents including system requirements, design documents, and verification and validation plans.

### **Build18 Hardware Hackathon**

Spring 2018

#### **Gesture Controlled Drone**

- Established wireless communication between onboard computer and ground station using TCP/IP protocol.
- Developed algorithm to convert hand pose sensor readings to motor control outputs.

## Skill

**Programming:** C++, Python, MATLAB, Git, Simulink, ROS, MS tools

**Relevant:** Gantt Chart, Solidworks, 3D printing, CNC, Laser cutting, FEA