Ruixuan (Wayne) Liu

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Education:

Carnegie Mellon University Pittsburgh, PA
Bachelor of Science in Electrical and Computer Engineering (University Honor) May 2019
Relevant Courses: Distributed Systems; Computer Networks; Embedded Systems; Digital Systems; Signal Systems; Systems Control; Computer Systems; Electronics and Circuits; ECE Capstone.
Master of Science in Robotics, School of Computer Science Aug 2021
Research Interests: Adaptive Systems; Robot Perception; Safe Human-Robot Collaboration.
QPA: 4.00/4.33
Relevant Courses: Adaptive Control and Reinforcement Learning; Robot Localization and Mapping; Machine Learning; Computer Vision; Kinematics, Dynamics, and Control; Geometry-based Vision.

Work Experiences:

Carnegie Mellon University (RI - Intelligent Control Lab) Pittsburgh, PA
Graduate Student Researcher Aug 2019-Present

- Developed an automatic robotic solution for polishing the weld bead on large industrial workpieces.
- Developed an iterative ICP algorithm for visual alignment, which estimates the 6D pose of the workpiece.
- Implemented robust anomaly detection using a laser scanner for detecting the weld bead.
- Conducting research on human motion prediction for safe human-robot collaboration.
- Proposed a novel RNNIK-MKF framework that combines the learning-based RNN and model-based IK for human arm motion prediction.
- The RNNIK-MKF is adaptable and has good generalizability to unseen humans and unseen tasks.

Zenuity (Perception & Localization Team) Detroit, MI
Algorithm Engineer Intern Summer 2019

- Implemented LIDAR obstacle detection on an autonomous mobile robot that maneuvers in the office.
- Developed algorithm for LIDAR ground estimation on autonomous vehicles.
- Improved the efficiency of the ground estimation algorithm.
- Discovered and fixed algorithm defects by consolidating system tests and unit tests.

Carnegie Mellon University (RI - The AirLab) Pittsburgh, PA
Computer Vision Research Assistant Nov 2017-Jan 2019

- Conducted research on LIDAR-camera sensor fusion. Utilized the edge and intensity information for target-free calibration.
- Programmed a stereo VO to reconstruct a large dense 3D model from a 4k image stream.
- Implemented high-resolution 3D-reconstruction with thermal texture capabilities for bridge/building inspection using stereo and infrared cameras.
- Developed a Template Matching algorithm to accomplish infrared camera calibration and infrared-visual calibration and sensor fusion.

Harbin Institute of Technology Shenzhen, China
Research Assistant Summer 2017

- Programmed an app that captures the motion of the phone and publishes commands to control the UAV.
- Achieved stable UAV control based on smartphone motion sensing.
- Users can control the drone by intuitive operations, such as tilting the phone.

DJI Technology (Navigation Team) Shenzhen, China
Software Engineer Intern Summer 2016

- Programmed multi-agent planning and GPS waypoints navigation for multi-drone collaboration.
- Drafted DJI SDK documentation for new engineers.

Skills:

Programming Languages: C++; Python; MATLAB; C; Java.
Tools: Linux; ROS; Git; Gazebo; SolidWorks.