LUXI HUANG

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EDUCATION

Master of Science in Robotics **Dec. 2020**
Northwestern University, Evanston IL *GPA:3.6*
Selected Courses: Computer vision, Perception, Robotics Manipulation, Deep Learning, Navigation, SLAM

Bachelor of Science in Mechanical Engineering; Mathematics **Dec. 2018**
University of Maryland, College Park, MD *GPA:3.3*

WORK EXPERIENCE

Robotics Software Engineering Intern **Jun. 2020 - Sept. 2020**
Shirley Ryan AbilityLab *Chicago, IL*

- Implemented autonomous wheelchair behavior packages in C++ with ROS
- Refined 3D object detection packages by implementing computer vision on doorway detection, ramp detection, and wheelchair desk-docking algorithms
- Generated formal integration testing plans for the hardware
- Wrote a final report in IEEE paper format and presented work in a final oral presentation

Research Assistant **Jan. 2017 - Dec. 2018**
The Sensor and Actuator Lab - University of Maryland *College Park, MD*

- Development of code and experimental platforms, running experiments and analyzing data in C and Matlab
- Implemented data-driven algorithms for sensing and control of robotic platforms
- Conducted research into wheeled robotics track moving barriers using ultrasonic signals

SELECTED PROJECTS (PORTFOLIO LINK)

Automated Doorway Detection for Intelligent Wheelchairs

- Built perception pipeline to locate doorways for intelligent wheelchair in ROS and C++
- Implemented computer vision to analysis 3D point clouds data from RGBD Camera
- Tested multiple doorway detection algorithms on various wheelchair positions by comparing their detected doorway position and door gap width in simulation (Gazebo) and in real-world

Extended Kalman Filter Simultaneous Localization and Mapping (EKF-SLAM)

- Developed 2D kinematics and navigation library from scratch in C++ for wheel robot on ROS platform
- Implemented machine learning feature detection algorithm for LiDAR scanner
- Adopted a landmark-based EKF SLAM algorithm on turtlebot3 to optimize the path trajectory and avoid obstacles

Mapping by Sensor Fusion with IMU and Camera

- Built mapping function with Point Cloud Library on Intel tracking camera T265 and depth camera D435i
- Implemented optical SLAM algorithm to detect loop closure by using the RGBD point cloud data, fisheye camera data, and Inertial Measurement Unit data
- Designed experiments to compare mapping quality between tracking camera and depth camera

Lego Stacking Manipulation Robot

- Collaborated in team of 4 to develop a system in controlling a Baxter (Rethink Robotics) to build with Legos
- Programmed 7-DOF arm navigation algorithm using ROS MoveIt (in Python) to accomplish motion planning, obstacle avoiding, and control the force on grippers
- Wrote script to test success rate and the result was greater than 90 percent to build a Lego pyramid

SKILLS

Robot: Robot Operating System (ROS), Gazebo, Moveit, Robot Manipulation, Computer Vision, Machine Learning, Motion Planing
Programming Languages: C++, C, Python, MATLAB, SimuLink
Libraries: Point Cloud Library (PCL), Eigen, OpenCV, PyTorch, WebGL
Developer Tools: Linux, Version Control (Git), Unit Test, CMake, gdb, AWS, Docker, microcontrollers