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 and using design pattern in C++ with ROS
· Refined 3D object detection packages by implementing computer vision and deep learning 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

Robotics 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
· Made a wheeled robot track moving obstacles using an ultrasonic sensor

SELECTED PROJECTS

Automated Doorway Detection for Intelligent Wheelchairs

· Built multi-threaded perception pipeline to locate doorways for intelligent wheelchair in ROS and C++
· Implemented computer vision algorithm 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 wheeled robot on ROS platform
· Implemented machine learning feature detection algorithm for LiDAR scanner
· Programmed a landmark-based EKF SLAM algorithm on Turtlebot3 to estimate robot state

Mapping by Sensor Fusion with Inertial Measurement Unit and Camera

· Built hand-held mapping device using sensor fusion 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 with team of 4 to develop a system to control a Baxter Robot Arm to build with Legos
· Programmed 7-DOF arm navigation algorithm using ROS MoveIt (in Python) to accomplish motion planning, obstacle avoidance, 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

Robotics: 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, Docker, Microcontrollers, CUDA