LUXI HUANG

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EDUCATION

Northwestern University (NU), Evanston,IL **Aug. 2019 - Dec. 2020 (Expected)**
Master of Science in Robotics
Related Courses: Robotics Manipulation, Machine Learning and Artificial Intelligence for Robotics, Machine Dynamics, Embedded Systems in Robotics, Design and Analysis of Algorithms, Quadrotor Design and Control

University of Maryland (UMD), College Park, MD **Aug. 2015 - Dec. 2018**
Bachelor of Science in Mechanical Engineering; Mathematics

SKILLS

Robot: ROS, Computer Vision, Machine Learning, Motion Planing, Version Control (Git), Linux
Libraries: Point Cloud Library (PCL), Eigen, PyTorch, OpenCV
Programming Languages: C/C++, Python, MATLAB/SimuLink

WORK EXPERIENCE

Automated Doorway Detection for Assistive Wheelchairs **Jun. 2020 - Sep. 2020**
Robotics Software Engineering Intern *Shirley Ryan Ability Lab, IL*

- Designed doorway detection algorithm with region-growing clusters on subscribed point clouds from RGBD camera
- Built a perception pipeline in C++ to detect doorway for assertive wheelchairs based on ROS platform
- Tested three point cloud segmentation methods on multiple wheelchair positions by comparing their detected doorway position and door gap width in simulation (Gazebo) and in real-world

Intelligent Ultrasonic Tracking Robot **Jan. 2017 - Dec. 2018**
Research Assistant *The Sensor and Actuator lab - UMD, MD*

- Designed and built a wheeled robotic to track moving barriers using ultrasonic signals sent through metamaterial sonar
- Coded on Launch-F28379D DSP board in C to track moved barriers by sending and receiving acoustic signals with PID control

SELECTED PROJECTS

Mapping by Sensor Fusion with IMU and Camera - NU **Jan. 2020 - Mar. 2020**

- Built Mapping Function with PCL on Intel tracking camera T265 and depth camera D435i individually
- Achieved loop closure property on depth camera by sensor fusion on IMU with RGBD, and accomplished loop closure on tracking camera by sensor fusion on IMU with fisheyes
- Analyzed difference of mapping quality between tracking camera and depth camera by comparing camera optometry in simulation and in the real world; concluded that tracking camera has more accurate odometer than depth camera

Robot Navigation From Scratch on Turtlebot3 - NU **Jan. 2020 - Mar. 2020**

- Developed 2D kinematics and navigation library in C++ for wheel robot on ROS platform
- Wrote circular feature detection algorithm for LiDAR scanner
- Implemented a landmark-based Extended Kalman Filter (EKF) SLAM algorithm to optimize the path trajectory to avoid obstacles

ReThink Robot Build Lego - NU **Sep. 2019 - Dec. 2019**

- Developped a system to control a Baxter (Rethink Robotics) to build with Legos
- Programmed whole node on 7-DOF arm trajectory algorithm using ROS MoveIt (in Python) to accomplish motion planning and 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 pyrimid

Quadrupedal Bio-inspired Robotics Project - UMD **Jan. 2018 - May 2018**

- Collaborated with a group of 3 students to design, build, and test quadrupedal bio-inspired newt robot
- Analyzed gait and implemented Inverse Kinematics to control robotic navigation in MATLAB on Arduino
- Created full technical drawing of robot components in Solidworks