Juhyung Lee

juhyunglee0313@gmail.com • 201-723-3962

Education

University of Rochester **Rochester, NY**

Bachelor of Science: Biomedical Engineering (Concentration: Medical Devices) May 2023

Minor: Electrical and Computer Engineering (Concentration: Robotics) May 2023

Cumulative GPA: 3.83

Website: https://juhyung-l.github.io/

Github: https://github.com/Juhyung-L

Blog: https://juhyungsprojects.blogspot.com/

Technical Skills

- Languages: C++, Python, Matlab
- Libraries/Frameworks: ROS2, OpenCV, Qt5, BehaviorTreeCPP, Gtest, Pytest
- Tools: Linux, Git, Docker, CMake, Blender, Gazebo, RViz

Personal Projects

BeheaviorTree Navigation | https://github.com/Juhyung-L/behavior_tree_navigation | **C++, ROS2, BehaviorTreeCPP**

- Uses a behavior tree to allow for a robot to perform recovery behavior when stuck while navigating to a goal.

Dynamic Obstacle Avoidance | https://github.com/Juhyung-L/dynamic_obstacle_avoidance | **C++, ROS2, Nav2**

- Global and local path planner for a mobile robot navigating in an environment with moving obstacles.

RGB-D Visual Odometry | https://github.com/Juhyung-L/RGB-D_visual_odometry | **C++, ROS2, OpenCV**

- Estimates the 3D motion of a depth camera by tracking and matching the features in consecutive image frames.

Autonomous SLAM | https://github.com/Juhyung-L/autonomous_slam | **C++, ROS2, Nav2**

- Sends a mobile robot to unexplored areas in the map when performing SLAM to fully map an indoor space without the need for human intervention.

Internships

Test Engineer Intern | *DEKA Research and Development* June 2022 - Aug 2022

- Developed an electro-mechanical fixture to automate the durability testing of a medical device prototype using a **Raspberry Pi**. The fixture sped up the durability testing phase by over 30%.
- Wrote a state machine **C++** program on the **Raspberry Pi** to move the stepper motors and linear actuators in the correct sequence to perform the durability testing.
- Improved a data analysis tool in **Python** for analyzing medical device test logs from an excel file by fixing runtime errors and adding 2 new features to extract insightful information from the data.

College Activities

Software Developer | *Capstone Project* Jan 2023 - May 2023

- Worked with a team of 5 engineers to develop a visualization-aid for a wheelchair-bound client.
- Led the software development of the primary GUI application using **C++**, **OpenCV**, and **Qt5**. The application performs real-time image processing on live video streams captured by three cameras attached to the wheelchair to provide the client with a comprehensive view of the environment around his wheelchair.
- Performed code profiling to identify and improve performance bottlenecks so the GUI program can run reliably for 8 hrs/day on an **Nvidia Jetson Nano**. The program's CPU usage was reduced by over 50% through profiling.

Software Developer | *Robotics Club* Sep 2021 - Dec 2022

- Developed a feature-based visual odometry system and A* search path planning algorithm using **C++** and **ROS2**.
- Modeled the competition arena using **Blender** and tested the performance of our robot in **Gazebo** simulation.