Jingkun (Allen) Liu

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EDUCATION

NORTHWESTERN UNIVERSITY **Sept 2023 - Present**

Master of Science in Robotics Candidate

ROSE-HULMAN INSTITUTE OF TECHNOLOGY **Sept 2018 - May 2022**

Bachelor of Science in Mechanical Engineering and Computer Science

- Minor in Multidisciplinary Robotics
- Dynamics System and Controls Concentration
- Dean's List from Winter 2018-19 to Spring 2021-22
- Best Project Selection for Computer Architecture I
- Best Mechanical Engineering Sophomore Students

SKILL

- **Programming Skills:** R, Python, Shell, Scheme, Lisp, C/C++, C#, Java, SQL, JavaScript, TypeScript, HTML, CSS, XML, Swift, Storyboard, Kotlin, MATLAB, Forth, YAML, LaTeX
- **Technical Skills:** ROS/ROS2, Bash Shell, Simulink, Firebase, Git, Linux, Computer Network, .NET, MoveIt/MoveIt2, Nav/Nav2, RViz, Gazebo, Node.js, React.js, OpenCV, OCR, YOLO, MS Office, Visual Studio, Arduino IDE, Docker, XCode, Android Studio, Xilinx ISE Design Suite, SOLIDWORKS, ANSYS, LoggerPro, LabView, KiCAD, Machine Shop, PCB, AI, ML

EXPERIENCE

DEKA RESEARCH AND DEVELOPMENT (Full-Time) - Manchester, NH **Jul 2022 - Jul 2023**

Robotics Embedded Software Engineer

- Developed **C++** software on **ROS Melodic** for teleoperation of same-day delivery and security robots
- Developed and tested the firmware on **Embedded Linux** of a customized multi-channel modem.
- Configured the **Netwotk Bounding** for multiple **Cellular** network channels through **VLAN**.
- Implemented the **ROS** nodes to monitor hardware status throughout the system.

ROSE-HULMAN VENTURE (Internship) - Terre Haute, IN **Nov 2021 - May 2022**

Software Development Engineer

- Utilized **C#** backend and **TypeScript** frontend with **React.js** for web application development
- Managed data storage using **.NET** framework and **SQL** databases
- Contributed to the development of import and export function on a website tracking taxation in multiple continue for Indiana.

ROSE-HULMAN INSTITUTE OF TECHNOLOGY (Research) - Terre Haute, IN **Jun 2021 - Nov 2021**

Breast Cancer Early Detection Research Assistant

- Redesigned and manufactured a robot arm for collecting force and displacement data on experiment.
- Programmed in **C++** over **Arduino IDE** to write the embedded software for the robot arm.
- Programmed in **MATLAB** to write the software on performing calculations on **Kinematics** and interacting with users.

ACADEMIC PROJECTS

Polyglot Bot **Oct 2023 - Dec 2023**

- Programmed in **Python** on **ROS2** to control the **Franka Panda** robot arm to translate a text write out on the whiteboard.
- Implemented text recognition using **OCR** and human recognition using **YOLOv8**.
- Applied **MoveIt!** to perform the motion planning of the robot arm.
- Generated Waypoints using **Matplotlib** and translated text via **Google Translation** API.
- Worked on the motion control of the **Emika Franka Panda** robot arm to write the specified character on the write board.

Pick-and-Place with Ridgeback-PX100-Sawyer Tri-Robot System **Jan 2024 - Mar 2024**

- Programmed in **Python** and **C++** on **ROS Noetic** on multi-robot system with **Ridgeback**, **Sawyer** and **PincherX 100** robot.
- Configured **Network** so that all robot and PC can communicate with each others.
- Applied **MoveIt!** for motion planning and **Nav** for path planning and **SLAM**.
- Fixed the hardware and software issue on **Sawyer** robot arm.

Extended Kalman Filter based SLAM **Jan 2024 - Mar 2024**

- Programmed in **C++** over **ROS2** platform.
- Implemented **Extended Kalman Filter** based **SLAM** algorithm from scratch on **Turtlebot3 Burger**.
- Modeled and implemented the **Kinematics** for **Differential-Dirve Mobile Robot**.
- Implemented **Supervised and Unsupervised Learning** model for landmark detection using **2D LiDar** input.