

# Jingkun (Allen) Liu

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## EDUCATION

Northwestern University

Sept 2023 - Present

*Master of Science in Robotics (In Progress)*

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 Certification.
- Dean's List for 8 consecutive quarters from Winter 2018-19 to Spring 2021-22.
- Best Project Selection Award for Computer Architecture I.
- Best Mechanical Engineering Sophomore Students Award.

## SKILLS

- **Programming Skills:** R, Python, Shell, Scheme, Lisp, C/C++, C#, Java, SQL, JavaScript, TypeScript, HTML, CSS, XML, Swift, Storyboard, Kotlin, MATLAB, Forth, YAML
- **Technical Skills:** ROS/ROS2, AI, ML, SLAM, EKF, Bash Shell, Simulink, LaTeX, Firebase, Git, Linux, Computer Network, .NET, MoveIt/MoveIt2, Nav/Nav2, 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

## EXPERIENCES

DEKA Research and Development Corp. (Full-Time) - Manchester, NH

Jul 2022 - Jul 2023

Robotics Embedded Software Engineer

- Collaborated with the team to deploy a **C++** embedded software to live-stream data over internet for a autonomous-driving robot.
- Developed and bench-marked the firmware of a customized multi-channel modem for bonding multiple cellular network channels.
- Configured the network on robot to enable **bonding** of multiple cellular network channels over **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*

- Collaborated with a team to deploy a web application for tracking tax information of multiple counties of Indiana.
- Programmed the front-end using **TypeScript** and back-end using **C#** while managing data over **SQL** and **.NET** framework.
- Implemented **Azure Pipeline** tool for **Continuous Integration and Continuous Deployment (CI/CD)**.

Rose-Hulman Institute of Technology (Research) - Terre Haute, IN

Jun 2021 - Nov 2021

*Research Assistant*

- Conducted the research on *Brest Cancer Early Detection* with Dr. Olson and Dr. Throne.
- Redesigned and manufactured a **4-DOF Robot Arm** for collecting force and displacement data on a sample membrane.
- Deployed a **C++** embedded software over **Arduino IDE** for the **low-level control** of the robot arm.
- Programmed in **MATLAB** to write the software for **high-level control** of the robot arm while interacting with user.

## ACADEMIC PROJECTS

Polyglot Bot

Oct 2023 - Dec 2023

- Collaborated with team to control the **7-DOF Franka Panda** robot arm to translate a text and write out on the whiteboard.
- Implemented text recognition using **OCR** and human recognition using **YOLOv8** and calibrated the camera with **Apriltags**.
- Utilized the **Google Translate** tool to translate the recognized text and generate the way-points with **Matplotlib**.
- Applied **MoveIt!** tool to plan and execute a trajectory following way-points generated to write the translated text on whileboard.

Pick-and-Place with Ridgeback-PX100-Sawyer Tri-Robot System

Jan 2024 - Mar 2024

- Programmed in **Python** and **C++** on **ROS Noetic** on a system consisting **Ridgeback**, **Sawyer** and **PincherX 100** robot.
- Configured **Network** to enable inter-communication between all robots and PC.
- 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 on Turtlebot3

Jan 2024 - Mar 2024

- Developed a **C++** software for performing **SLAM** algorithm on **Turtlebot3**.
- Implemented **Extended Kalman Filter** based **SLAM** algorithm and **Kinematics** model for **Turtlebot3** from scratch.
- Implemented **Unsupervised and Supervised Learning** model for data clustering and landmark detection from **2D LiDar** input.
- Modeled and incorporated the **control** and **odometry** for **differential-drive mobile robot**.