

Jingkun (Allen) Liu

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EDUCATION

Northwestern University

Sept 2023 - Dec 2024

Master of Science in Robotics

- Relevant Courses: Embedded System for Robotics, Robotics Manipulation, Sensing Navigation and Machine Learning for Robotics, Active Learning for Robotics, Deep Reinforcement Learning.

Rose-Hulman Institute of Technology

Sept 2018 - May 2022

Bachelor of Science in Mechanical Engineering and Computer Science, Minor in Multidisciplinary Robotics

- Awards: Magna Cum Laude, Top Project in Computer Architecture, Best Mechanical Engineering Sophomore.

SKILLS

- **Programming:** C, C++, Python, Java, Shell, C#, Lisp, SQL, JavaScript, TypeScript, HTML, CSS, Swift, Kotlin
- **Robotics:** ROS/ROS2, SLAM, EKF, OpenCV, MoveIt/MoveIt2, Nav/Nav2, OpenCV, OCR, YOLO, Dynamics
- **Mechanical:** SOLIDWORKS, ANSYS, Simulink, LoggerPro, LabView, KiCAD, Machine Shop, PCB Design
- **Other Technical:** MATLAB, CMake, Git, Linux, Docker, Bash Shell, Forth, YAML, XML, LaTeX, Firebase, Networking, .NET, React, MS Office, Visual Studio, Xilinx

PROFESSIONAL EXPERIENCES

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

Jul 2022 - Jul 2023

Robotics Embedded Software Engineer

- Developed C++ software in ROS for autonomous-driving delivery robot.
- Implemented real-time data streaming and hardware monitoring over an internet connection.
- Engineered novel firmware in C and C++ for custom multi-channel cellular modem.
- Configured network on robot over VLAN for bonding multiple cellular network channels.

Rose-Hulman Venture (Internship) - Terre Haute, IN

Nov 2021 - May 2022

Software Development Engineer

- Developed a web app with TypeScript, C#, SQL, and .NET for tax tracking across Indiana.
- Automated the CI/CD process using Azure Pipeline.
- Implemented the import feature, enabling website to import data from file.

PROJECTS

Extended Kalman Filter based SLAM on Turtlebot3

Jan 2024 - Mar 2024

- Developed C++ SLAM software on ROS2 for Turtlebot3's autonomous localization in dynamic settings.
- Implemented kinematics and odometry models for Turtlebot3, offering precise location and orientation estimates.
- Integrated both Unsupervised and Supervised Learning models for effective data clustering and landmark detection from 2D LiDAR inputs, facilitating precise landmark positioning recognition.

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

Jan 2024 - Mar 2024

- Implemented Python/C++ on ROS for Ridgeback, Sawyer and PincherX 100 arm's pick-and-place automation.
- Used MoveIt and ROS Navigation for efficient motion planning and obstacle-free target access.
- Configured network for robust communication among three robots and a PC, ensuring smooth connectivity.

Translate Text using 7-DOF Franka Panda Robot Arm

Oct 2023 - Dec 2023

- Developed Python on ROS2 for Franka Panda, enabling real-time text translation and whiteboard writing.
- Applied OCR and YOLOv8 for text and human detection, facilitating interactive text translation.
- Integrated MoveIt! with AprilTags for exact trajectory planning and whiteboard detection, ensuring robot safety.
- Leveraged Google Translation for accurate text conversion and employed Matplotlib to create precise waypoints.

Motion Control on KUKA youBot Mobile Manipulator

Oct 2023 - Dec 2023

- Developed MATLAB software for feedforward-feedback control on KUKA youBot for precise pick-and-place tasks.
- Implemented the kinematics and dynamics model for the KUKA youBot from scratch.
- Engineered 5-degree Cartesian trajectory generator for optimized path planning.