Jiaheng Liao

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EDUCATION

University of Toronto — Sep 2020 - Jun 2025
BASc in Engineering Science - **Robotics Engineering**
- Relevant Courses: Data Structures and Algorithms, Mobile Robotics and Perception, Robot Modelling and Control, Computer Vision, AI and ML, Microprocessors and Embedded Systems

SKILLS SUMMARY

Programming Languages: Python, C/C++, Perl, SQL, Bash
Tools and Libraries: Linux, Ubuntu, ROS, Docker, VM, Git, Pytorch, OpenCV, Gazebo, RViz
Networking: TCP/IP, DNS, routing, switching, HTTP, ROS2/DDS
Embedded/Hardware: Arduino, Raspberry Pi, Nvidia Jetson, PLC, UART, I2C, SPI, Wiring, Oscilloscopes, Multimeters

EXPERIENCES

PCIGITI Group, Sickkids Hospital — Sep 2024 - Apr 2025
Robotics Engineer — Toronto, ON
- Developed Python/ROS algorithms for distance-based haptic feedback, modeling repulsive forces proportional to tool–tissue distance [Link]
- Integrated ROS2/DDS networking over TCP/IP for real-time topics
- Configured robotic simulation environments (AMBF, Blender, SDFs) and validated system with SIL and HIL
- Designed experimental methods and demonstrated 12% improvements in accuracy [Report]

AMD — May 2023 - Aug 2024
QA Engineering Intern — Markham, ON
- Developed and automated regression workflows on Linux using Bash, increasing coverage and reducing manual effort
- Diagnosed and resolved regression failures by analyzing logs, configurations, and timing reports; consulted and documented solutions in Confluence
- Engineered Python, Tcl, Perl, and C shell scripts to streamline lint, synthesis, and CDC flows, reducd post-processing time
- Automated static code testing with cron and Bash; partnered with design teams to achieve a 90% reduction in lint violations
- Supported RTL code and 100+ lint waivers in CI/CD Perforce pipeline
- Reported GPU/APU design violations via Jira, coordinating fixes across 4+ projects and 20+ IP blocks

Shlien Lab, Sickkids Hospital — May 2022 - Aug 2022
Software Engineering Intern — Toronto, ON
- Designed GUI to automate patient data upload with REST API, eliminated manual data upload steps
- designed Python/MySQL pipeline to parse patient records and auto-populate fields, reducing human error

CACT Group, University of Toronto — May 2021 - Aug 2021
Automation Intern — Toronto, ON
- Designed HMI (Human Machine Interface) control system using PLC and stepper motors in C++
- Created system schematic and assembled all wiring and hardware connections
- Validated system operation with multimeter, improved test repeatability for coating abrasion experiments
- Awarded Undergraduate Research Fellowship ($8000)

University of Toronto Aerospace Team — Sep 2020 - May 2021
Rocketry Recovery Team Member — Toronto, ON
- Designed detection system for parachute release using Arduino Nano, accelerometer, IR sensor, SD and real-time clock modules in **C/C++**

PROJECTS

Phantom Cybernetics [Link]
- Extended Gazebo source code to publish depth camera sensor topics into HTTP Server using C++

Autonomous Drone Navigation [Link]
- Developed obstacle avoidance 2D Mapping pipeline using depth camera and BFS algorithm
- Implemented Station-keeping and Waypoints Navigation algorithms for quadrotor drone
- Integrated depth camera, SLAM camera, Jetson Nano and Pixhawk4 flight controller using LAN, ROS2/DDs and TCP/IP

Mobile Robot SLAM and Control [Link]
- Deployed LiDAR, camera and wheel-encoder on mobile robot
- Integrated sensors for occupancy grid mapping & PID line following in Gazebo/RViz and real-world tests

KUKA & Puma 560 Robotic Manipulator [Link]
- Deployed motion planning and obstacle avoidance algorithm on six-axis manipulator for object grasping and placement tasks using MATLAB Robotics Toolbox