

Ethan Jeong

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SKILLS

Languages: C, C++, Python

Firmware & Embedded: STM32, ARM Cortex-M4, RTOS (FreeRTOS), I2C, SPI, CAN, UART, CMake, Make

Robotics & AI: Jetson Orin, ROS2, DDS, SLAM, OpenCV, Isaac Sim, Isaac Lab, RViz2, MoveIt2, YOLOv8

Platforms & Tools: Linux, Git, KiCad, Multimeter, Docker, GitHub Actions, GDB

EDUCATION

B.Eng. in Computer Engineering – Toronto Metropolitan University

Expected April 2028

EXPERIENCE

Incoming Firmware Developer Intern

September 2026 — December 2026

The Home Depot Canada

Toronto, ON

Research Assistant

December 2025 — Present

Intelligent Systems & Robotics / Micro Manufacturing (ISRMM) Laboratory

Toronto, ON

- Architected the C++ control stack on a Unitree G1 **29-DoF** humanoid robot with an FSM and polymorphic behavior interface over Unitree SDK2, letting new robot behaviors be added as self-contained modules
- Developed a **500 Hz** control loop with thread-safe command queuing, joint-limit enforcement, and data logging
- Designed a vision pipeline for object detection and grasping by streaming depth and color and used camera intrinsics/extrinsics to map targets into robot-frame coordinates achieving **82–92%** detection confidence
- Built a synthetic data pipeline in Isaac Sim using Omniverse Replicator to randomize lighting, object pose, materials, and camera angle to generate **2,000+** images, and wrote a script to export labels in YOLOv8 format for training
- Integrated MoveIt2 for collision aware dual-arm motion, dynamically populating the planning scene from live detected obstacle geometry to prevent obstacle collisions, and RRTConnect motion plans solved in under **50 ms**

Control Systems Software Lead

September 2024 — Present

MetRocketry Design Team

Toronto, ON

- Directed a subteam to control roll stabilizing fins on an STM32 using FreeRTOS, achieving **10 ms** actuator latency
- Engineered Linear and Extended Kalman Filter on an ARM Cortex-M4 microcontroller to optimize state estimation, achieving low latency of **316 μ s** altitude and velocity updates alongside **2 ms** attitude updates
- Wrote C drivers for SPI/I2C sensors hitting a **2 ms** acquisition rate using mutexes to eliminate race conditions
- Configured interrupt pins and binary semaphores to pace sensor reads off events, eliminating continuous polling

Software Developer Intern

May 2025 — August 2025

First Insurance Funding of Canada

Toronto, ON

- Triaged **500+** static analysis findings spanning OWASP Top 10 categories, confirming false positives and remediating true vulnerabilities including path traversal and SQL injection in a production .NET C# system

IT Support Intern

May 2024 — August 2024

First Insurance Funding of Canada

Toronto, ON

- Automated Excel data manipulation and reporting with Python, saving manual work on user cleanup and data pulls

PROJECTS

Flight Computer PCB

GitHub

- Routed a **4-layer** PCB in KiCad with dedicated power and ground planes, implementing **50 Ω** impedance matching for RF traces to minimize EMI and integrated IMU, GPS and Barometer using SPI, UART and I2C respectively
- Implemented downlink telemetry up to **45k ft** by interfacing both a LoRa transceiver and a GPS module over SPI
- Length matched the **4-bit SDIO** bus within **2.5 mm** across all six traces, placing the microSD socket to suit the MCU's pinout allowing clock and data to stay aligned, allowing signals arrive at the same time to prevent corruption