

HEWITT MCGAUGHEY

San Francisco, California, USA

📞 (416) 659-3488

✉️ hmcgaugh@uwaterloo.ca

LinkedIn: linkedin.com/in/hmcgaughey

Github: github.com/hewittmcg

SKILLS

Languages: C, C++, Python, Rust, ARM Assembly, Linker script

Tools: Bazel, GDB, CMake, Wireshark, Hyperfine, Git, Bash, Vim

Technologies/Frameworks: FreeRTOS, Linux, Zephyr, QNX, Docker

WORK EXPERIENCE

Applied Intuition ↗

Mountain View, California, USA

Software Engineer

September 2024 – Present

- Wrote C firmware and C++ systems software across a variety of firmware and embedded POSIX platforms.
- Designed and owned a cross-platform diagnostics stack (firmware and QNX) over CAN and Ethernet.
- Profiled and optimized firmware stack for a 23% CPU usage reduction. Included redesign of CAN stack.
- Built cross-device USB update functionality across embedded Linux platforms using RAUC and Nginx.
- Designed a crash-dump mechanism for Cortex-M7 persisting RTOS state and CPU registers to flash, enabling GDB-readable, thread-aware core dumps.
- Implemented sequencing of Ethernet switch OTA updates between firmware and QNX computes.
- In Python, built observability tooling for firmware: CPU load, CAN status, test routine execution.

Tesla ↗

Palo Alto, California, USA

Firmware Engineering Intern (Body Controls)

May 2023 – August 2023

- Wrote high-performance DMA UART firmware enabling Cybertruck lighting animations on all exterior lights.
- In C, implemented step-tracking algorithm for SPI stepper motor driver, eliminating positional drift.
- Added performance metric reporting functionality to LIN driver; now deployed across all Tesla platforms.

Parallel Systems ↗

Los Angeles, California, USA

Software Engineering Intern

January 2023 – April 2023

- Wrote Rust software running on an Nvidia Jetson Orin to govern the operation of a self-driving electric train.
- Wrote PID controller allowing for 5% increased range via restriction of charge current.
- Integrated LZ4 compression into TCP telemetry stream, leading to a 7x bandwidth reduction.

Splunk ↗

Toronto, Ontario, Canada

Software Engineering Intern

May 2022 – August 2022

- In C, wrote firmware for a Nordic nRF52840 to report a variety of sensor readings over BLE.
- Wrote full-stack Python code for an Embedded Linux device to forward environmental sensor readings.
- Added redundancy to software update process, using MQTT to gracefully detect and handle failures.

onsemi ↗

Waterloo, Ontario, Canada

Firmware Developer Intern

September 2021 – December 2021

- In C, wrote bare-metal I2C, ADC, GPIO, and Timer drivers for board bring-up of a Cortex-M0+-based device.

EDUCATION

University of Waterloo

Sept. 2019 – May 2024

Bachelor of Applied Science, Mechatronics Engineering

Waterloo, Ontario, Canada

Computing Option · 87% average (3.9 GPA)

PROJECTS

Firmware Subteam Project Lead, Midnight Sun Solar Car Team ↗

- From 2019 to 2023, wrote C firmware to control a solar car using STM32F407 microcontrollers.
- Led firmware development for power selection and motor controller interface boards.
- Developed low-level drivers for various ICs, incl. MCP2515 CAN controller and BTS7200 load switch.

Cymric RTOS ↗

- In C, wrote a real-time kernel supporting fixed-priority pre-emptive task scheduling.
- Hand-wrote Cortex-M7 context switch implementation using ARM assembly.