Shane Williams

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Education

Memorial University of Newfoundland — St. John's, Canada

Bachelor of Computer Engineering; GPA: 4.00 / 94.8% — *2019 – 2024*

Experience

Tesla — Palo Alto, CA

Firmware Platforms Engineer — *Fall 2024 –*

Firmware Platforms Intern — *Fall 2023*

- Developing and maintaining low-level driver support for many different microcontroller architectures and families for use across multiple teams at Tesla.
- Reviewing hardware designs and bringing up many new multi-MCU PCBs for use in upcoming vehicle programs.
- Owning firmware build systems, code generation tooling, and debugging tooling to improve developer efficiency.
- Creating hardware-in-the-loop testing systems for validating low-level firmware.

Firmware Integration Intern — *Summer 2022*

- Owned several firmware features end-to-end, working with external suppliers and mechanical, electrical, firmware, regulatory and safety teams across Tesla to bring them into production.
- Wrote safety-critical vehicle firmware in bare-metal C on Cortex-M microcontrollers for interior vehicle endpoints.
- Presented prototype vehicle features to company executives.

NVIDIA — Santa Clara, CA

Firmware Development Intern — *Fall 2021*

- Wrote U-Boot and embedded Linux firmware for an ARM Cortex-A processor on a custom PCIe device.
- Developed kernel and userspace drivers in C for a PCIe controller and PHY.

Kepler Communications — Toronto, Canada

Firmware Development Intern — *Summer 2020, Winter 2021*

- Owned firmware development for a new cutting-edge satellite radio using C bare-metal on a Cortex-M MCU.
- Wrote satellite flight computer firmware using C and FreeRTOS on a Cortex-R processor in a Xilinx SOC.
- Wrote a file system and ARQ protocol for satellite communications using C++ on a Linux platform, improving satellite throughput by 5-200%.

Projects

Senior Capstone Project – Remotely Operated Quadcopter — *2023 – 2024*

- Designed one of two onboard drone PCBs, which included a microcontroller, digital radio, USB-PD sink, power regulation, GPS, video transmitter, and a Qi wireless charging sink.
- Wrote all onboard firmware, including PID flight controls, using FreeRTOS on a Cortex-M microcontroller.
- Created tooling in Python for generating peripheral drivers for the 10+ onboard ICs from YAML register maps.
- Wrote ground station software and a control terminal program using Python and React with gRPC.

Student Team – Killick-1 Cubesat — *2020 – 2022*

- Designed the software architecture for a scientific nanosatellite ground station and led a team of four students in its implementation.
- Wrote Python for satellite tracking, communication and scheduling, telemetry database management, data visualization and remote control.

Skills

Languages: C, C++, Python, Java, Rust, Javascript

Tools & Frameworks: Linux, U-Boot, FreeRTOS, Make, CMake, SCons, Buck2, GDB, Git, Docker, OpenGL

Protocols: HDMI, PCIe, TCP, UDP, SPI, I2C, I2S, UART, CAN, LIN, LoRa

Hardware: PCB schematic & layout with KiCAD; LV system design; PCB bringup, rework, and lab skills