

# Shane Williams

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[github.com/shanetwilliams](https://github.com/shanetwilliams)

## EDUCATION

### Memorial University of Newfoundland

Bachelor of Computer Engineering; 4.00 GPA / 94.8%; Valedictorian.

St. John's, Canada

2019 – 2024

## EXPERIENCE

### Tesla

Firmware Platforms Engineer

Palo Alto, CA

Fall 2024 – Present

Firmware Platforms Intern

Fall 2023

- Developing low-level drivers for numerous microcontroller families for use across the Tesla vehicle firmware org.
- Owning the firmware build system for 50+ developers, including a fresh rewrite to improve build speed by 5-20x.
- Bringing up new PCBA designs on a monthly basis, working with HW engineers on review and validation.
- Creating and maintaining internal tooling to improve embedded developer experience and 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

Firmware Development Intern

Santa Clara, CA

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

Firmware Development Intern

Toronto, Canada

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 satellite file system and ARQ protocol using C++ on a Linux platform, improving throughput by 5-200%.

## PROJECTS

### Senior Capstone Project – Remotely Operated Quadcopter

2023 – 2024

- Designed one of two onboard drone PCBs, including an RP2040 microcontroller, Semtech LoRa radio, USB-PD sink, power regulation, GPS, video transmitter, and a Qi wireless charging sink.
- Wrote all onboard firmware including motor controls and power management using C and FreeRTOS.
- 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 nanosatellite ground station and led a team of four in its implementation.
- Wrote Python for satellite tracking and communication, telemetry management, and remote control.

### shanewilliams.ca

2024 – Present

- A personal website written in Svelte and Python dedicated to Canadian political data visualization.

## 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