

Education

University of Waterloo

Bachelor Of Applied Science - Computer Engineering

Waterloo, ON, Canada

Sep 2022 - Apr 2027

- Varsity Men's Track & Field, USPORTS (Canadian NCAA) Academic All-Canadian 2026 & 2025, ECE Wellness Rep, Dammizio Scholarship

Skills

Languages & Build: C (User and Kernel space), C++, ARMv8 ISA, RISC-V ISA, System Verilog, Python, Buildroot, Make, Meson

Relevant Skills: Bootloaders (U-boot, Coreboot, Bare-Metal), UNIX CLI, Linux Kernel (Networking, Perf Profiling, etc), Real-time Systems, Communication Protocols (SPI, Ethernet, etc), Power Management Systems, Telemetry Systems, Memory & Storage (eMMC, DDR)

Other Skills: JTAG Debugging, GDB, Logic Analyzers, Altium, AMD Vivado, Circuit Analysis, Wireshark, Ftrace, Docker, Git

Professional Experience

Tesla – System Software Engineering intern

Austin, TX & Palo Alto, CA Jan 2026 - Aug 2026

- Infotainment team, designed & shipped networking, communication & power-management related firmware in User & Kernel space
- Produced high-performance **C and C++** firmware across Bootloader and Linux Kernel, under heavy constraints, with **buildroot** system
- Spearheaded **eBPF** integration with a **Linux Network Monitor**, reducing CPU usage from **5%** to **0.5%**, while using **1/4** of the memory
- Architected & shipped a **Serial UART multiplexing scheme** with across **boot & kernel**, for capture & upload of panic traces. Captured **~75%** of kernel panic logs across fleet, and provided **previously unreachable** logs, leading to (to my knowledge) **20+** issues resolved
- Contributed to **Power Management** on the Cybercab platform, most notably **S2idle** and **S3 sleep**, and integrating with connectivity
- Completed **Bootloader Optimizations** involving driver cleanup & caching improvements, bringing boot times down **~8%** across fleet.
- Worked with **Thermal Monitoring**, implemented bug fixes involving alerts and telemetry during CPU throttle & Coolant issues

Remedy Technologies – Founder, Firmware Engineer

Waterloo, ON Jan 2025 - Aug 2026

- Medication management platform. Architected a multi-node embedded system & brought up **TI AM62 Sitara** based MCU evaluation board, including boot chain (SPL, U-Boot), **Power Sequencing** and Linux Kernel porting. Achieved end-to-end boot in **8 seconds**
- Architected a pill mapping subsystem with in-house **camera & LIDAR FW**, and **real-time control**. 99.99% reliability on 10,000+ scans
- Built a **ethernet** based inter-board **RPC protocol w/ Protobuf**. Achieved sub-millisecond latency & 0% failure rate across 1B+ packets
- Ported an in-house bare-metal **RTOS & bootloader** for a Real-time controls on STM platforms, specific to requirements

Kepler Communications – Embedded Software Engineering Intern

Toronto, ON May 2025 - Aug 2025

- Flight Software team, developed embedded solutions for a satellite fleet to bring high-speed internet to space (Launched Jan 2026)
- Worked with **C and C++** on a very resource-constrained and timing-critical **AMD Zynq SoC (ARM Cortex-A53, Cortex-R5F, FPGA)**
- Led design & development of a **C++** embedded config manager w/ **Protobuf & SQLite3**. Added **95%+ coverage** tests w/ **Google Test**
- Developed an embedded publish-subscribe message framework w/ **ZeroMQ**, improved latency by **85%**, reduced bad packets by **35%**
- Assisted integration of a flight software **build system** using **Meson**. Optimized **Embedded Linux** build system w/ **Yocto and Bitbake**

Ford Motor Company – Firmware Engineering Intern

Ottawa, ON Sep 2024 - Dec 2024

- Bootloader, BSP & Kernel team, developed drivers with **C in User & Kernel space** for **ARM Cortex-A53** SoC w/ resource-constraints
- Improved bootloader stability, reducing boot fails from **LPDDR, eMMC and Interrupt Controller (GIC-500)** across fleet to **< 0.0001%**
- Contributed to **Power Management**, most notably improving **LPDDR & eMMC** firmware during suspend & resume sequences
- Worked with debug hardware (Lauterbach PowerDebug **JTAG + TRACE32**) for memory level debugging. Managed work w/ Atlassian

450 Solutions – Embedded Software Developer Intern

Tokyo, Japan Jan 2024 - Apr 2024

- Connectivity & Power Firmware team, contributed to high level design, as well as driver development for a Point-of-Sale system.
- Worked with **C and C++** to develop drivers for a **Bluetooth LE** printer system. Also worked on optimizing power usage by interfacing with **display drivers** and the onboard **PMIC**. Improved end-to-end printing speed by **25%** and reduced display power usage by **15%**

Personal Projects

[Bare-Metal Bootloader & RTOS \(SprinterOS\)](#) (Click to Learn More + Try A Simulation of it Yourself)

Dec 2024 - Present

- Bare-metal** board bring up (bootloader & kernel) for an **ARM Cortex-M7** based STM32F7, without HAL, using **C & ARMv7 Assembly**
- Boot Drivers & Bring up:** Memory Layout (Linker scripts), Clock & Reset, UART, GPIO, Watchdog, SPI, SD (using SPI), OS-Loader
- Kernel & BSP:** Context Switching, Virtual Memory, Binary Buddy Dynamic Mem Allocation, SysTick driven Pre-emptive Scheduling, Power Modes, Shared Memory, Concurrency Primitives, IPC, L1 Cache Integration, Virtual FS Layer with LittleFS Backend
- Used debug hardware (**SEGGER J-Link JTAG & STLink**) and **GDB** to perform memory and register level debugging & verification