

Daniel Han

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SUMMARY OF QUALIFICATIONS

- 2A Computer Engineering student at UWaterloo with work experience in embedded systems, RTOS, and communications protocols. Interested in aerospace, PCB design, controls, and safety-critical systems.

EDUCATION

University of Waterloo

B.A.Sc. Computer Engineering - 89% Avg

Waterloo, Ontario

Sept. 2025 – Aug. 2030 (Co-op)

EXPERIENCE

Firmware Developer

University of Waterloo Orbital

Waterloo, Ontario

Aug. 2026 – Present

- Designed and implemented A/B app partitioning with fallback, the bootloader, OTA architecture, AES encryption, and dynamic reset vectors on the TI RM46 (ARM Cortex-R4F).
- Followed safety-critical practices by ensuring high assertion density and fixed loop upper bounds.
- Implemented CC1120 low-power transceiver drivers using RTOS queues.
- Utilized TI F021 FAPI to implement app erase/write, jump to app, CRC + ECC + blank check validation functions, and A/B app read/write selection using C, custom linker scripts, and CMake for compilation options.
- Authored command interface between ground station (GS) and satellite through UART (Prototyping substitution for RF). Used for uploading app binary, up/downlinking telemetry, and RTC sync, among others.
- Implemented Arducam photo capture through SPI and I2C, outputting JPEG bytes in Base64 through UART.

Communications Developer

University of Waterloo Orbital

Waterloo, Ontario

Sept. 2025 – Dec. 2025

- Implemented AX.25 S-frames on both down/uplink communications, crucial to flow, sync, and error control.
- Implemented logic for satellite responses to supervisory commands such as RR, RNR, REJ, and SREJ, to prevent de-synchronization between ground and satellite using C++.
- Wrote app_update.py logic to help ground station identify if the satellite is running the app or bootloader in preparation for software update.

Automation Specialist

Toronto Transit Commission

Toronto, Ontario

Jan. 2026 – Apr. 2026

- Authored scripts to calculate hardware UIDs for laptops, eliminating manual acquisition and saving approximately 15 minutes per laptop across 10,000+ devices.

PROJECTS

BLDC Motor Driver PCB and Firmware | C, C++, STM32, KiCad

Sept. 2026 – Present

- Writing firmware for the Nucleo F446RE + IHM07M1 BLDC interface shield for open-loop acceleration and sensorless six-step commutation using BEMF zero-crossing detection.
- Used Saleae logic analyzer to verify proper timing and PWM, as well as debug the startup cycle.
- Utilized STM32CubeMX to generate HAL code for the BLDC motor driver and configure the clock.
- Developing custom BLDC driver PCB that integrates the Cortex M4 and the L6230PD driver.

Dart Turret | Fusion 360, Arduino, 3D Printing, Breadboarding

Apr. 2024 – May 2024

- Led team of 4 to rapidly prototype a competing robot for the CETA Robotics competition, ultimately placing first among 13 teams.
- Designed flywheel launcher using Fusion 360, resulting in ~85% accuracy with a ~15% bullseye rate.
- Engineered barrel profile for irregular dart shape, increasing surface contact and improving range by ~30%.
- Coordinated mechanical, electrical, and firmware integration across the team to ensure on-time competition submission.

TECHNICAL SKILLS

Languages & Frameworks: C, C++, Bash, JavaScript, Python, SQL (SQLite), HTML/CSS, PowerShell, Django

Embedded: Linker scripts, CMake, RTOS, UART, I2C, SPI, AX.25, Cortex-R, Cortex-M, Arduino

Miscellaneous: Git, Soldering, Oscilloscope, Multimeter, COMSOL FEA, Fusion 360, KiCad, Breadboarding