

TRISTAN ALDERSON

Work Authorization: Dual US & Canadian Citizen

12809 25 Ave, Surrey, BC • 604-828-1437

TALDERSON42@GMAIL.COM • [linkedin.com/in/trist-alderson](https://www.linkedin.com/in/trist-alderson) • [t-alderson.github.io](https://github.com/t-alderson)

EDUCATION

Bachelor of Applied Science in Electrical and Computer Engineering

Queen's University • *Dean's Scholar*

Kingston, ON

05/2026

WORK EXPERIENCE

Avionics Lead

05/2025 – Present

Queen's Rocket Engineering Team (QRET)

Kingston, ON, Canada

- **Leading 10 engineers** to architect a 2026 hybrid rocket avionics network, including a custom backplane with PCIeX1, ESP32 telemetry control, and STM32 sensor/solenoid integration.
- Own full **PCB design cycle** for avionics and propulsion controller boards: create specs, select components, design schematics & layouts in **KiCad**, generate Gerbers/BOMs, assemble via JLCPCB, debug, and iterate designs through hardware & firmware testing.
- Designed **application-layer CAN protocol** for a bus with radio forwarding to ground station for real-time telemetry.
- Engineered 18650-based 24V SAFE power architecture with lockout relay, default fail-safe valve behavior using a **DC-DC 24V boost and 3.3V/5V bucks**.
- Organized design reviews, documentation, \$1,500 avionics budget, server procurement, and automated testing while coordinating integration with propulsion, structures, and GSE subteams.

Embedded Software Engineer Intern

05/2024 – 08/2025

Evertz Microsystems

Burlington, ON, Canada

- Designed and maintained an embedded backend controller on **Zynq UltraScale+ MPSoCs**, implementing a distributed control system and event-based logging.
- Built a reboot-safe **GNSS data logging** system using atomic file I/O, to guarantee long-term integrity.
- Integrated **Prometheus/Grafana device telemetry** into a **COM Express module**, a monitoring system for storing and visualizing real-time device metrics across various subsystems.

AI Engineer & Avionics Developer

10/2023 – 08/2024

Queen's Rocket Engineering Team (QRET)

Kingston, ON, Canada

- Secured **2nd Place at Launch Canada** by implementing **YOLOv8** computer vision and **PID** control, simulated using **Matlab**, for an automated rocket tracking system.
- Served on a 10-person launch team in New Mexico, managing **18650 battery management systems** and critical altimeter/GPS configurations.
- Designed, fabricated, and integrated custom **SAM M10Q GPS board** (schematic → layout → assembly → flight).
- Developed a **I2C** library for real-time accelerometer data processing to determine launch state and trigger flight events.

Programmer and Assembler

05/2023 – 09/2023

Radius Security

Richmond, BC, Canada

- Manufactured remote-guarding surveillance units, awarded an achievement for wire management.
- Contributed to **Lean** process improvements that increased manufacturing space and overall **efficiency by 20%**.

PROJECTS

LiteLM: Portable On-Device LLM Inference (Capstone Project)

08/2025 – 03/2026

Queen's University

Kingston, ON

- Earned **Third Place for Top Computer Engineering Project** at the Queen's ECE Showcase for a low-power, offline AI system deployed on the **AMD Xilinx Kria KV260** (Zynq UltraScale+).
- Architected high-bandwidth **AXI4** communication and implemented **AXI DMA** via custom **kernel drivers** to manage data transfers between the ARM Cortex-A53 and FPGA fabric.

SKILLS

EDA Tools: KiCad, LTspice, Vitis HLS, Vivado

Platforms and Hardware: COM Express, ESP32, STM32, Zynq UltraScale+ MPSoCs

Programming Languages: C/C++, Python, Matlab, Verilog/SystemVerilog

Frameworks & Tools: U-Boot, Fluent-bit, GDB, Prometheus, Grafana, OpenSSL, OpenCV

Networking & Protocols: ACL/TCAM, DMA, AXI4 (Lite, Full, Stream), CAN, I2C, LoRa, NTP/PTP

Operating Systems: Linux, Windows, RTOS