

RELEVANT EXPERIENCE

- **Aversan Inc.** 05/2025 - 08/2025
Hardware Engineering Intern - Mississauga, ON
 - Debugged a persistent display startup issue where the screen stayed pink by probing power rails and SPI lines, identifying improper buffer voltage as the root cause. Implemented a hardware fix that resolved the issue across all units.
 - Diagnosed a power failure on an LCD board by tracing the issue to a shorted LED driver and common-mode choke. Replaced components and restored full 13.5 V operation.
 - Conducted thermal testing of LCD backlights from $-70\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$, identified abnormal current spikes (200 mA vs. 20 mA typical) at $>70\text{ }^{\circ}\text{C}$, and recommended cross-unit testing to determine scope.
 - Ensured hardware changes adhered to DO-254 & DO-160 standards for airborne hardware systems.
- **Starfish Medical** 09/2024 - 12/2024
Electrical Engineering Co-op - Victoria, BC
 - Designed a dense 4-layer, 84-channel filter PCB in Altium. Implemented per-channel LC $50\ \Omega$ matching to reduce reflection at the connector.
 - Developed an STM32-based vibration monitoring system with LIS3DHTR sensors over SPI in C to assess surgical laser stability. Debugged firmware using a logic analyzer. Determined that a damping mechanism must be introduced to reduce system resonance by $\sim 50\%$.
 - Built a prototyping board and characterized S11 on a VNA near 350 kHz. Engaging the LC matching network improved return loss by $\sim 4\text{ dB}$ at 350 kHz.
 - Ensured PCB designs and embedded systems met IEC 60601 medical device safety standards, reviewing layouts for compliance with EMI, insulation, and leakage current requirements.
- **Wrmth** 01/2024 - 04/2024
Electrical Engineering Technician - North Bay, ON
 - Designed and manufactured a portable quality control device to measure resistances in a 24-pin Chogori harness using voltage divider circuits, reducing unit testing time by $\sim 90\%$.
 - Engineered a user-friendly interface for the QC device using C, implementing interrupt handling to prioritize measurement changes across critical components.
 - Designed the electrical schematic for a concrete 3D printer in KiCad. Performed power calculations for motor sizing and MCU selection.

PROJECTS

- **Capstone: Thermotherapy Device**
ESP32, STM32, BLE, Altium, Schematic and Layout Design
 - Designed a dual-MCU PCB for a medical therapy device, integrating an STM32 control processor and an ESP32-S3 BLE/display subsystem, with emphasis on RF front-end design, antenna matching, power integrity, ESD protection, and debug-focused layout.
- **Power Distribution PCB**
Altium Designer
 - Designed the schematic and layout for a power distribution board to supply T200 thrusters and sensors for the Deep Blue Design Team's submarine project.
 - Selected and configured a buck converter IC to deliver 12V at 3A from an 18.5V source for submarine motor control. Calculated & sourced passive components to maintain voltage ripple under 5%.
 - Integrated Zener diodes for continuous voltage regulation and TVS diodes for transient voltage suppression into board design.

SKILLS

- **Hardware:** PCB Design, Bring-Up & Debugging, High-speed Routing, HDI, Signal Conditioning, Sensors
- **Embedded Development:** C/C++, Python, FPGA, STM32, Raspberry Pi, ESP32, UART, SPI, I2C
- **Lab Equipment:** Oscilloscope, DMM, VNA, Power Supply, Logic Analyzer, Spectrum Analyzer, Hi-Pot
- **Tools:** Altium, OrCAD (Cadence), LTspice, SystemVue, ST-LINK/JTAG, MATLAB/Simulink, Linux

EDUCATION

- **University of Waterloo** Waterloo, ON
Candidate for BAsc, Honours Mechatronics Engineering 09/2021 - 04/2026