Siddharth Muralikrishnan

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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 °C to +125 °C, identified abnormal current spikes (200 mA vs. 20 mA typical) at >70 °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 Ω 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 ~50%.
  - Built a prototyping board and characterized S11 on a VNA near 350 kHz. Engaging the LC matching network improved return loss by ~4 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 Intern - 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 ~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 and debugged a dual-MCU PCB for a medical therapy device, integrating an STM32G4 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.
  - Characterized antenna feedline impedance using a VNA and designed a PI matching network targeting 50 Ω, guiding passive component selection for RF tuning.
- **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, 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*