Aryan Aryal

780 802 4642 | aryal2@ualberta.ca | linkedin.com/in/aryanaryal | portfolio

Education

University of Alberta Class of 2027

BSc. Electrical Engineering Co-op

Technical Skills

Software & Tools: C/C++, Python, Git, MATLAB, Linux

Hardware Design: PCB Layout & Design (Altium Designer, KiCAD), Battery monitoring, Buck/Boost converters

Embedded & Firmware: FreeRTOS, Bare-metal C, MCU Programming, UART, SPI, I2C, CAN, Peripheral Drivers

Verification & Test: Hardware Bring-up, Signal Debugging, Root Cause Analysis, System Integration Testing

Work Experience

Electrical Engineering Intern Jan – Sept 2025

Wilson Analytical Services St. Albert, AB

- Updated firmware for STM32-based PCBs, implementing and optimizing FreeRTOS-controlled real-time sensor logic
- Designed and evaluated op-amp circuits for signal-to-noise improvement, raising measurement resolution by 30% in frequency-response testing.
- Conducted extensive overcurrent, power, and thermal limitation troubleshooting of buck converters, identifying and mitigating potential failure points.
- Automated oscilloscopes in Python to capture and process signal information, overhauling existing pipeline to increase frame-rate and data throughput by 10x.
- Developed calibration routines for flow sensors, adhering to scientific standards and datasheet recommendations and abstracting to a fast and simple user front-end.
- Automated startup with error correction with systemd on embedded linux, cutting user intervention in half.
- Exposed limitations in test platform hardware and drove improvements for future iteration.
- Soldering, assembly and testing of several in-house R&D projects, including debugging circuit boards.

Electrical Engineering Co-op May – Aug 2024

Modular Construction Research Group Edmonton, AB

- Implemented servo control (MACH3) to reduce CNC machine cycle time by 75%, from 120 min to 30 min.
- Led validation, debug, and iterative efforts on automatic control and human-machine interfaces (HMIs) for operator safety and accuracy to optimize production line workflow.
- Designed schematics, panel layout, power calculations, and technical specifications for industrial machinery.

Projects

Technical Project Co-Lead, Autonomous Robotic Vehicle Project (ARVP) Sept 2023 – Present

- Leading an interdisciplinary team of 40+ members to build an autonomous submersible to compete at RoboSub 2025.
- Built and maintained a centralized PCB component library (footprints, symbols, revision control) to reduce part sourcing time by 15 minutes per component, eliminate errors from mismatched footprints, and standardize DFM practices.

Battery Monitoring System | Altium Designer, Teensy 4.0, CANbus, Voltage/Current Monitoring, Error telemetry

- Designed and tested a PCBA to power the internal subsystems of an autonomous submersible, implementing reverse-polarity, OV, UV protections and input switching, as well as robust I2C and CAN communications.

Wireless IR Morse Code Translator | ATmega328p, avr-libC, IR receiver/emitter

- Designed a baremetal timer-interrupt system on ATmega328p without high-level frameworks for decoding Morse-ASCII with fast transmit/receive mode switching for independent 2-way IR communication.

Transistor Amplifier | ATmega328p, avr-libC, IR receiver/emitter

- Built a multi-stage BJT audio amplifier targeting >11 V/V voltage gain and >10 V peak-to-peak output without clipping.

Personal Website | Astro.js, HTML, CSS, Javascript

- Developed a mobile-responsive website to house my personal projects and blogs.