

Dylan Cunliffe

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TECHNICAL SKILLS

Languages: C, C++, Python, Assembly, SystemVerilog, Verilog, MATLAB, NumPy

Embedded Systems & Hardware: PCB Design, Mixed-signal design, Analog Design, FPGA design and verification, STM32, ESP32, Arduino, CAN Bus, SPI/I2C/UART, GPS/GNSS, Circuit prototyping, Soldering, Signal Integrity

Software & Tools: Altium Designer, LT Spice, Linux, Quartus, ModelSim, FPGA boards, PyTorch, OpenCV, Git

EDUCATION

University of British Columbia

Bachelor of Applied Science in Electrical Engineering

Expected Graduation: Apr. 2029

CGPA: 3.90/4.33

TECHNICAL PROJECTS

Mixed-Signal Doppler Radar System | *STM32, LTSpice, Analog Design, Active Filters* Feb. – Mar. 2026

- Designed and **simulated** an active analog signal chain in LTSpice, utilizing an active bandpass filter, and rail-to-rail op-amps to cleanly amplify microvolt-level Doppler shifts from a 10.5 GHz X-band radar module
- Engineered a 4-layer **mixed-signal PCB** in Altium Designer, implementing strict floorplanning to isolate noisy high-speed digital domains (I2C/UART) from the sensitive analog filters
- Developed **bare-metal C firmware** for an STM32G4 microcontroller to sample the analog waveform via onboard ADCs, calculate velocity data, and drive a local OLED interface while logging telemetry
- Executed physical hardware bring-up, utilizing **oscilloscopes to validate** LDO power stability, verify op-amp AC/DC gain staging, and debug **signal integrity** across the analog-to-digital boundary

Automotive Sensor Telemetry PCB | *Altium Designer, CAN, Power Electronics* Nov. – Dec. 2025

- Designed schematics and routed a 2-layer PCB for EV telemetry, integrating an **STM32G0** MCU to aggregate GPS, speed, and thermal sensor data via **SPI, UART, I2C, and CAN** protocols
- Designed a high-efficiency power stage using a DC-DC Buck Converter with **input filtering** and **reverse polarity protection** to step down 12V vehicle power to a stable 3.3V logic rail
- Engineered a **noise-resilient communication** interface using a CAN Transceiver with split termination and TVS diode protection to withstand automotive EMI and voltage transients
- Created PCB layout in **Altium Designer**, implementing differential pair routing for high-speed CAN signals and strict zoning to **minimize EMI and ground loops** while implementing **thermal relief** for heat dissipation

Edge AI Traffic Light Control System | *Python, YOLOv8, Nvidia Jetson, Embedded AI* Oct. – Dec. 2025

- Engineered an **embedded vision system** using the NVIDIA Jetson Orin Nano to detect vehicles with YOLOv8n and dynamically control a **hardware traffic light system** in real time using an FSM traffic controller
- Achieved stable **real-time inference** (~30 FPS) using CUDA-accelerated preprocessing, and TensorRT model optimization for efficient deployment
- Developed a **modular Python application** for camera capture, frame handling, and traffic-light state management running fully on embedded Linux

8-Bit FPGA RISC Processor | *SystemVerilog, Digital Logic, FPGA Boards, CPU Architecture* Oct. 2025

- Designed and implemented a fully functional **8-bit CPU** supporting arithmetic and logical operations with condition flags for both signed and unsigned calculations on an **Intel MAX10 FPGA** development board
- Built **register file** and ALU to form a CPU datapath capable of executing custom machine instructions
- Developed and tested** low-level machine language programs (e.g., summation, factorial, Fibonacci, and GCD) to validate CPU functionality under multiple instruction sequences

🔗 [View more projects on my portfolio website...](#)

EXPERIENCE

Bicycle Mechanic

Spokes Bicycle Rentals

May 2025 – Sep. 2025

Vancouver, BC

- Diagnosed and repaired mechanical failures** on a fleet of 1000+ bicycles; optimized workflow to handle high-volume maintenance under strict time constraints
- Completed over **1700 maintenance entries** over a 4-month period, demonstrating high efficiency while following expected quality standards and attention to detail