

Dylan Cunliffe

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EDUCATION

University of British Columbia

Bachelor of Applied Science in Electrical Engineering

Vancouver, BC

Expected Graduation: May 2029

TECHNICAL SKILLS

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

Embedded Systems & Hardware: PCB Design & Layout, FPGA design and verification, STM32, ESP32, CPU architecture, CUDA, TensorRT, embedded Linux, Arduino, CAN Bus, SPI/I2C/UART, GPS/GNSS, circuit prototyping

Software & Tools: Altium Designer, Linux, VS Code, Quartus, ModelSim / QuestaSim, FPGA boards, PyTorch, OpenCV, ONNX Runtime, CUDA profiling tools, MATLAB Simulink, OnShape, Git, NumPy

TECHNICAL PROJECTS

Automotive Sensor Telemetry PCB | *Altium Designer, STM32, 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 **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. 2025 – Present

- 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
- Achieved stable **real-time inference** (~30 FPS) using CUDA-accelerated preprocessing, ONNX, and TensorRT model optimization for efficient embedded deployment
- Developed a **finite state machine** (FSM) traffic controller that integrates model outputs, debounced button inputs, and minimum-green timing logic for deterministic timing transitions
- Developed a **modular Python application** for camera capture, frame handling, and traffic-light state management running fully on embedded Linux

Sea to School Traffic Forecasting | *C, Python, ESP32, Embedded Systems, Data Processing* Jun. – Nov. 2025

- Designed and prototyped an **ESP32-based embedded system** to collect and log roadway sensor data for traffic prediction model development
- Developed microcontroller firmware** in C for reliable data acquisition, SD card storage, and error handling to ensure consistent long-term data capture
- Processed and analyzed collected data to identify temporal traffic patterns, implementing predictive timing and time correction algorithms in a modular **C application**

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 a **dual-ported register file** and integrated it with an ALU to form a simple CPU datapath capable of executing 8 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

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
- Quickly adapted to the role, learning all aspects of bicycle maintenance and repair in only a few weeks