EMIL VU

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EDUCATION

University of Victoria — **Victoria, BC**
Master of Electrical and Computer Engineering (MEng) — *Expected Sep 2026*
Bachelor of Electrical Engineering (BEng), Co-op — *Sep 2019 - Sep 2025*

SKILLS

Languages: Python, C/C++, Verilog, VHDL, MATLAB.
Embedded & Hardware: FreeRTOS, STM32, BLDC/PMSM motor control, FOC, PWM, CAN, SPI, I2C, UART.
Software & DevOps: Git, Jira, Docker, CI/CD, Bamboo, Agile.
RF & Analog: HF amplifier design, filter design (Chebyshev, pi-network), LTspice.
CAD/Design: SolidWorks, Fusion 360, KiCad, EAGLE PCB.

WORK EXPERIENCE

University of Victoria — **Victoria, BC**
Graduate Teaching Assistant (ECE 250, ECE 299, ECE 350, ECE 355, ECE 441, ECE 455) — *Sep 2025 - Aug 2026*

- Validated VHDL designs in Xilinx Vivado on Digilent Nexys A7 FPGA, including adder/multiplier logic, a VGA image-processing pipeline, and a MicroBlaze soft-core with AXI debugged via ILA.
- Operated SDR labs in GNU Radio using USRP/RTL-SDR (AM/SSB/FM/PSK, FLEX decoding) and analog-circuits labs using oscilloscopes, function generators, DMMs, and wattmeters.
- Programmed and debugged FreeRTOS firmware on STM32F4 (tasks, queues, software timers) and a custom EDF deadline-driven scheduler.
- Programmed and debugged bare-metal STM32F0 in C/CMSIS (timers, EXTI interrupts, DAC/ADC, SPI OLED), verifying NE555/optocoupler PWM with a function generator, oscilloscope, and DMM.

Avigilon - Motorola Solutions — **Vancouver, BC**
System Test & Validation (Co-op) — *May 2023 - Dec 2023*
Product: Advanced security solutions with high-definition surveillance cameras and access control systems.

- Developed a new Python test automation framework, improving automation efficiency by 30% and reducing testing time by 8 hours per cycle.
- Designed and deployed 3D-printed testing jigs using Fusion 360, reducing cost by $300 per station.
- Created test specifications from system requirements and developed, maintained, and executed automated software and hardware tests.
- Integrated test automation into CI/CD using Jira, Bamboo, and Docker in Agile.

Loop Energy — **Burnaby, BC**
Electrical Engineer (Co-op) — *Sep 2022 - Apr 2023*
Product: High-efficiency hydrogen fuel cell systems and batteries for commercial vehicles.

- Assembled 10+ wiring harnesses and ran first-article inspections with root-cause analysis, driving corrective actions that improved design quality and accelerated bring-up.
- Built a Raspberry Pi 4 + PiCAN3 VCU simulator in Python + CAN to validate controller behavior, replace physical test benches, and shorten validation by days.
- Co-designed an FCU simulator with swappable wiring and I/O access for harness, sensor, and pump testing. Enforced controller-spec safety constraints and streamlined testing.

PROJECTS

FOC Firmware for Adaptive Arm-Rehabilitation Device — **University of Victoria**
MEng Thesis Project — *Sep 2025 - Present*

- Built complete Field-Oriented Control (FOC) firmware from scratch in C/C++ for an 8-bit ATmega328P (Arduino UNO), including Clarke/Park transforms, min-max SVPWM, register-level 31.4 kHz PWM, ISR-based quadrature decoding, and anti-windup PID.
- Added automated identification of motor parameters (R, L, flux linkage) and a closed-loop impedance controller, then validated a programmable spring-damper rehabilitation mode with a DRV8302 inverter, AMT103 encoder, GM4108 gimbal motor, and a 3D-printed Fusion 360 mount/pendulum.

Portable HF Linear Amplifier with BPF/LPF for Emergency Communications — **University of Victoria**
BEng Capstone Group Project — *Sep 2024 - Apr 2025*

- Co-designed a 140 W PEP linear HF amplifier (1.8-30 MHz, AM/SSB) based on the Motorola EB63, modernizing obsolete components and adding mode select, manual bypass, and fuse circuits.
- Designed and simulated a two-stage pi-network constant-k bandpass filter (1.8-30 MHz) and a 9th-order T-network Chebyshev low-pass filter (30 MHz) in LTspice. Produced schematics and PCB layouts in KiCad.
- Assembled the prototype with a custom coil-winding jig and a laser-cut/3D-printed enclosure. Validated amplifier gain (AM-mode power sweep) and filter S21 response against spec on a VNA.