

# Aleksandar Filipovic

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## EDUCATION

### University of British Columbia

*Bachelor of Applied Science in Electrical Engineering*

Vancouver, BC

*Expected April 2028*

- CGPA: 85.6%
- Relevant Coursework: Integral Calculus (93%), Electrostatics and Magnetism (89%), Mechanics (92%)

## EXPERIENCE

### Electrical Engineering Intern

*MCW Consultants LTD*

May 2025 – July 2025

*Vancouver, BC*

- Conducted electrical design with Vancouver's YVR Airport, focusing on power distribution schematics and energy-efficient lighting systems for a 28,000 square meter area
- Generated over 15 detailed electrical site plans and single-line diagrams in AutoCAD and Revit, ensuring compliance with Canadian Electrical Code (CEC) standards
- Authored technical specification documents and project submittals for client review
- Collaborated with mechanical and civil engineering teams to integrate power systems into building designs

### Mechatronics Sub-Team

*UBC BAJA, BAJA SAE*

Sept. 2025 – Present

*Vancouver, BC*

- Engineered a real-time CVT thermal monitoring system using SMBus protocols to stream sensor data to the driver dashboard, enabling predictive maintenance and preventing belt failure
- Optimized vehicle-wide CANBus communication by refactoring message arbitration and payload structures in C, achieving a 15% reduction in data latency
- Designed and validated a 4-layer Data Acquisition (DAQ) PCB in Altium Designer, implementing differential signaling to ensure signal integrity for the on-board STM32 microcontroller

## PROJECTS

### CVT Belt Temperature Sensor System | *STM32, C, I2C, SolidWorks*

Sept. 2025 – Feb. 2026

- Developed embedded firmware in STM32CubeIDE to interface an MLX90614 IR sensor with a custom STM32-based PCB via I2C, enabling real-time monitoring of CVT belt temperature
- Integrated sensor hardware with the vehicle's Rear ECU to transmit telemetry data to a Raspberry Pi for live driver dashboard visualization
- Modeled a custom 2.0mm aluminum bracket in SolidWorks and validated system accuracy via dynamometer testing, implementing smoothing algorithms to correct positional data undershoot

### FPGA Tron Game | *C, Nios V (RISC-V), VGA, DE10-Lite*

Nov. 2025

- Developed a high-performance arcade game on a DE10-Lite FPGA, utilizing the Nios V (RISC-V) soft-core processor to handle real-time game logic and collision detection in C
- Implemented hardware interrupts for precise input handling and utilized bit masking to efficiently manipulate VGA memory-mapped control registers
- Designed a custom double-buffering rendering pipeline to eliminate screen tearing and ensure smooth 60Hz visual performance

### Minesweeper Python Project | *Python, Tkinter, OOP*

Aug. 2025

- Engineered a Minesweeper clone in Python, developing core game logic, win/lose conditions, and customizable grid sizes using an Object-Oriented Programming (OOP) class-based system
- Utilized the Tkinter library to design and build the complete graphical user interface (GUI)

## TECHNICAL SKILLS

**Languages:** C, Python, MATLAB, SystemVerilog, RISC-V Assembly

**CAD & PCB Design:** Altium Designer, Revit, AutoCAD, Solidworks

**Hardware & Protocols:** STM32, FPGA (DE10-Lite), Nios V, CANBus, I2C, VGA

**Software & Tools:** Git, LTspice, MS Office, Quartus Prime, Platform Designer

**Lab Equipment:** Oscilloscope, Multimeter, Power Supply, Logic Analyzer