




Allan Zhou

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EDUCATION

University of Toronto

Toronto, ON

Bachelor's in Electrical and Computer Engineering (cGPA: 3.84/4.00)

April 2027 (Expected Graduation)

PROFESSIONAL EXPERIENCE

Electrical & Embedded Systems Engineering Intern

May 2025 – April 2026

Engineering Design Lab | Electric Mobility Innovation

Toronto, ON

- Leading high-voltage electrical architecture, in-house electronics manufacturing, and embedded software design for a remote-controlled amphibious transportation vehicle engineered for the Arctic with a target endurance of **30 km**.
- Designed, tested, and integrated electronic control modules (PCBs) to drive electric vehicle actuators while analyzing circuits using oscilloscopes and function generators to ensure reliable operation at over **1000 W**.
- Implemented embedded C software on ARM Cortex (STM32) microcontrollers for CAN communication, actuator control, interrupt-driven memory management, and robust sensor data acquisition.

Low Voltage Architecture Lead & Driverless Firmware Lead

September 2023 – Present

University of Toronto | Formula SAE Electric

Toronto, ON

Low Voltage Architecture Lead (May 2025 – Present)

- Designed PCB schematics and layouts, assembled components, and tested in-house electronics using Altium and electrical testing instruments, leading to **500+ km of vehicle testing** and **80+ km of failure-free racing**.
- Developed efficient power regulation and distribution systems, reliable CAN communication, and critical safety architectures by producing engineering schematics, power budgets, and harness diagrams to support design.

Driverless Firmware Lead (Sept 2024 – May 2025)

- Created autonomous vehicle RTOS firmware to integrate autonomous finite state machines into manual drive software, leading software development in C++ and Python for **3 custom electronic control modules**.

Hardware & Firmware Engineering Researcher

May 2024 – September 2024

University of Toronto | Safety, Equity, and Design Lab

Toronto, ON

- Developed custom Python scripts for automating data acquisition to support the diagnosis of device failures during testing, saving **10 hours** of data analysis and file organization time across **120 experiments**.
- Integrated hardware and firmware for cardiopulmonary resuscitation (CPR) feedback devices communicating with sensors over I2C, improving compression rate and recoil for rescuers by **12.45%** and **18.18%**, respectively.

Robotics Team Captain & Mentor

September 2019 – August 2024

FIRST Robotics Competition | Team 6135

Toronto, ON

- Designed, manufactured, and validated electrical systems and embedded firmware in Java, leading to successful operations in **91% of 45 matches** and the team's first qualification to the World Championships.

PROJECTS

Steering Control Module | Canadian Arctic Transportation Vehicle

May 2025 – Present

- Designed and validated a switch-mode power supply, full-bridge motor driver, and CAN communication circuits to precisely control high-power actuators, enabling high steering resolution within **0.05 degrees**.
- Integrated electronic control modules with embedded software to communicate over CAN with safety watchdogs, accurately read quadrature encoders, and control motors at **100 Hz** using interrupts and direct memory access.

High-Voltage Discharge Control Module | Formula SAE Electric Vehicle

September 2024 – March 2025

- Designed, assembled, and validated a custom 6-layer PCB with isolated power regulation, discharge relays, and high-side drivers for battery and high-voltage safety systems operating at **600 volts**.

RISC-V Processor | Digital Design Lab

September 2024 – December 2024

- Developed and simulated a 16-bit processor, implementing finite state machines, registers, flip flops, and arithmetic logic units (ALUs) in System Verilog using simulation tools (ModelSim).

SKILLS

Software: C/C++ (FreeRTOS, STM32, PlatformIO), SystemVerilog, Python (NumPy, Pandas, Matplotlib), Git

Hardware: Altium Designer, KiCad, Oscilloscopes, Function Generators, Digital Multimeters, Power Supply Units