Allan Zhou

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Professional Experience

Driverless Firmware Lead Engineer September 2023 – Present
University of Toronto | Formula SAE Electric *Toronto, ON*

- Architected **C++ state machine firmware** for microprocessors and onboard computers communicating via **CAN** protocols to control **electric vehicle systems** in **autonomous** and **driver-controlled** operations reliably.
- Constructed a vehicle data acquisition system with **custom printed circuit boards**, **harnesses**, and **firmware**.
- Performed **root-cause analysis** to debug electrical systems and improve reliability using **testing equipment**.
- Used **MATLAB** to streamline race data exportation from Race Studio 3 for vehicular analysis.

Engineering Research Intern May 2024 – Present
University of Toronto | Safety, Equity, and Design Lab *Toronto, ON*

- Designed **hardware** and **firmware** for a feedback device using sensors communicating using **I²C** protocols, improving compression depth and rate for rescuers performing cardiopulmonary resuscitation (CPR) by **20%**.
- Created custom **Python scripts** for automated device data acquisition, visualization, and organization.
- Effectively **communicated** team findings in written papers, scientific presentations, and conferences.

Team Captain & Mentor September 2019 – Present
FIRST Robotics Competition | Team 6135 *Toronto, ON*

- Built, wired, programmed, and repaired team robots for provincial and international championships.
- Led year-long training of **40+** members on **mechanical**, **electrical**, and **software engineering** skills.
- Managed logistics and team finance, raising over **$20,000** from sponsors and grants in the 2022/2023 season.
- Applied engineering design principles with rigorous **testing** and **validation**, leading a World Championships berth.

Software Engineering Intern October 2023 – June 2024
LifeTein *Remote*

- Optimized **CSS**, **HTML**, and **JavaScript** code to enhance speed and accessibility, improving website performance by **10%** (based on Google Lighthouse analytics).
- Used **version control** (Git) and local servers (PHP) to track and test code changes.
- Deployed web browser tools to analyze website statistics and implement improvements.

Education

University of Toronto Toronto, ON
Electrical and Computer Engineering *(Engineering Science Specialization)* *September 2023 – Present*

- **CGPA: 3.84**
- Minor in **Engineering Business**

Projects

Vehicle Data Acquisition | *Formula SAE Electric Vehicle* September 2023 – Present

- Developed vehicle system with **printed circuit boards** designed for acquiring vehicle cooling and dynamics data.
- Built **harnesses** for motor and inverter coolant, strain gauge, damper potentiometer, and tire temperature sensors.
- Wrote **C++ firmware** to transmit data from interrupt and analog signals using **CAN** protocols.

Callisto | *FIRST Robotics Competition World Championship Robot* August 2021 – June 2022

- Constructed **command-based teleoperation** and **autonomous control systems** for a tank drivetrain, flywheel shooter, and climb system using **Java**, Gradle, and **version control** (Git, GitHub).
- Deployed PID controllers, encoders, gyroscopes, and cameras for precise control during driving and shooting.
- Wired, crimped, and soldered **electrical** components and deployed **firmware** to electrical control units.

Skills & Experiences

Languages: Java, Python, C++, JavaScript, HTML/CSS
Tools: Altium, Git, GitHub, Visual Studio Code, PlatformIO, MATLAB
Awards: University of Toronto Engineering Research Fellowship, Susana Arnott Robotics Leadership Award
Certifications: Swim & Lifesaving Instructor, Canadian National Lifeguard, Standard First Aid with CPR-C
Experiences: Aquatics Administration & Program Management, Community Facility Supervisor