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.
- Constructed a vehicle data acquisition system with **custom printed circuit boards**, **harnesses**, and **firmware**, adding **16 additional data sources** for analyzing and improving vehicle cooling systems and dynamics.
- Performed **root-cause analysis** to debug and improve reliability of electrical systems using **testing equipment**.

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 I^2C communication, improving compression rate and recoil for rescuers performing cardiopulmonary resuscitation (CPR) by **12.45%** and **18.18%**, respectively.
- Created custom **Python scripts** for automating device data acquisition and visualization, reducing time spent on data analytics and organization by **10 hours** over **120 experiments**.
- Effectively **communicated** team findings in written papers, scientific presentations, and conferences.

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

- Applied engineering design principles to rigorously design, construct, test, and validate 3 team robots, leading to qualification at 2 Provincial Championships and 1 World Championship.
- Led hands-on workshops to train members in **mechanical**, **electrical**, and **software engineering** skills, enhancing overall team expertise and resulting in the retention of **20+** students.
- Managed logistics and team finance, raising over **$20,000** from sponsors and grants in the 2022/2023 season.

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

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

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

- Soldered and tested custom **printed circuit boards** designed for data acquisition using analog signals.
- Built sensor **harnesses** for motor and inverter cooling, strain gauges, damper pots, and tire temperatures.
- 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