

# Tony Zhu

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## EDUCATION

### University of Waterloo

*Bachelor of Applied Science in Electrical Engineering*

Waterloo, ON

Present

### Harry Ainlay Highschool

*International Baccalaureate Certificate*

Edmonton, AB

Sept. 2021 – June 2025

## TECHNICAL SKILLS

**Languages:** C, C++

**Hardware & EDA:** Altium Designer, PCB Layout, Schematic Capture, Arduino, AutoCAD

**Developer Tools:** VS Code, CLion

**Productivity:** Microsoft Office, Google Workspace

## PROJECTS

### Ultrasonic Distance Security System | *C++, Arduino, Circuit Design*

Dec. 2025

- Designed and prototyped a security system integrating an HC-SR04 ultrasonic sensor, LCD 1602 display, and IR receiver to detect objects within a 2-400cm range.
- Implemented a C++ finite state machine to manage distinct "Active" and "Silent" operating modes, toggleable via a decoded IR remote signal.
- Optimized system performance by utilizing interrupt handling to resolve timing conflicts between the IR receiver and LCD refresh cycles.
- Engineered a multi-stage alert system with visual LED indicators and frequency-modulated audio alarms based on real-time proximity data.

### Wifi/Website Controlled Lighting System | *Arduino, C++*

Oct. 2025 – Nov. 2025

- Designed and programmed a two-node IoT system using ESP8266 microcontrollers to enable wireless communication over Wi-Fi.
- Configured one ESP as a transmitter to send RGB LED control signals to a receiver node hosting a web server.
- Implemented HTTP-based communication for real-time color and flashing control.
- Developed and debugged embedded firmware using the Arduino framework and serial monitoring tools.

## EXPERIENCE

### Design Team Member

Jan. 2026 – Present

*Waterloo Aerial Robotics Group (WARG)*

Waterloo, ON

- Selected for the Electrical sub-team after successfully completing a rigorous PCB design bootcamp using **Altium Designer**.
- Executed the full hardware design flow including schematic capture, component selection, and PCB layout in compliance with team standards.
- Collaborating with the hardware team to assemble, solder, and validate custom electronics for autonomous aerial vehicles.

### Assistant Badminton Coach

July 2023 – March 2025

*The Derrick Golf and Winter Club*

Edmonton, AB

- Assisted in training athletes ages 6-16, focusing on skill development, discipline, and teamwork.
- Provided one-on-one feedback and mentorship, improving athlete performance in competitions.
- Organized practices, drills, and match strategies, developing leadership skills, and event coordination.

### Sterilization

Sept. 2023 – Jan. 2024

*Riverbend Square Dental*

Edmonton, AB

- Ensured safety and precision by sterilizing and preparing dental instruments under strict hygiene protocols.
- Maintained accurate records of sterilization cycles and equipment usage.
- Supported dentists and hygienists by organizing tools and ensuring treatment rooms were prepared efficiently.
- Gained experience working in a fast-paced, team-based environment with high standards of accuracy and reliability.