# ALEX ZHENG

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## EDUCATION

**University of Waterloo —** BASc. Mechatronics Engineering *Sep 2023 - Apr 2028*

**Cumulative GPA —** 95.14% | Recipient of First in Class Engineering Scholarship | Dean's Honor List

## SKILLS

- **Languages —** C, C++, Python, Java, C#, SQL, Linux, VHDL, MATLAB, Git, Bash, XML, YAML
- **Technologies —** STM32, Arduino, FPGA, ESP32, Raspberry Pi, ROS, PLC, REST/SOAP APIs
- **Tools & Protocols —** Oscilloscope, 3D-Printing, Soldering, DMM, I²C, SPI, CAN, USB, Component Sourcing
- **CAD —** Altium Designer, SolidWorks, AutoCAD

## EXPERIENCE

**Undergraduate Research Assistant (Ultrasonic Soldering Lab) — University of Waterloo** *Sep 2024 - Present*

- Designed a secure, thermal-controlled chamber for an in-lab, chip test fixture, using SolidWorks, by utilizing cooling fans, heaters, viewing slots, and thermistor mounts, while zeroing convection with attachable walls
- Wrote control code for a PID controller with PWM slew-rate limiting, ensuring heaters and fans smoothly control temperature within ± 0.2 °C, by using a Raspberry Pi, Python, and a self-calibrated thermistor

**Software Developer Intern — Ontario Ministry of Transportation** *May 2024 - Aug 2024*

- Led the set-up of Mobile Camera Units, enabling remote locations across Ontario to capture and process driver's licenses, by performing test simulations, connecting cameras and sig. pads, and debugging edge cases
- Wrote Python and SQL scripts that verify, format, and transfer driver data across 4 apps, using the pyodbc module
- Tested to full reliability for 5 apps (.NET & WebLogic) using NUnit, SoapUI, Jakarta EE, WSDL, and XML/XSD files
- Created wikis, WebLogic domains, and set-up guides for 7 apps from scratch, reducing onboarding time by 90%

**Hardware Member — University of Waterloo Midnight Sun Solar Rayce Car Team** *Sep 2023 - Dec 2023*

- Sourced and assembled a battery management State-of-Charge PCB for a known shunt resistor and battery
- Laid out the board using Altium by considering noise, decoupling capacitors, vias, and the right measurements

## PROJECTS

**Test Fixture Results Automator (PFC Interview Challenge) —** C++, *Arduino, Color Sensor, LCD, I²C, USB, SPI, PTP*

- Designed a non-invasive process to retrieve test results by using a color sensor that detects red (fail) results, and a camera that captures and stores the images of the failed tests, fully eliminating human supervision
- Wrote C++ for the Arduino; used a USB host shield, SPI, and PTP for the camera, and I²C for the color sensor

**Coffee Can Antenna (Synthetic Aperture Radar) —** *RF, Radar, Analog Design, MATLAB, Audacity*

- Assembled the monopole antennas for wave-propagation by using free-space and guide wavelength theory
- Implemented op-amps, filters, modulators, mixers, regulators, oscillators to generate and receive radio signals

**SolidWorks Quoting System** *— .NET, C#, SolidWorks API, Visual Studio*

- Built an Add-in directly in SolidWorks to take CAD files by using Windows Forms, COM Interop, and the SW API

## ACHIEVEMENTS

- Won 1x Gold, 3x Silver for Team Canada Dragon Boat 18U at the 2023 World Champs, against China, USA, Thailand
- Achieved <8% of all solvers on Project Euler (math-based logic problems); solved 3 Jane Street monthly puzzles