Alex Zheng

a58zheng@uwaterloo.ca | +1 (416) 565-3482 | al3xzheng.com | in/al3xzheng

EDUCATION

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

Cumulative GPA: 95.14% | First in Class Engineering Scholarship | Dean's Honor List

SKILLS

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

EXPERIENCE

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

- Developed control code for a PID controller with PWM slew-rate limiting, to ensure heaters smoothly control temp. within ± 0.2 °C for an IC test fixture, by using Raspberry Pi, Python, and a self-calibrated thermistor
- Designed the temp. modulation circuitry to be user-friendly by extensively investigating viable parts, verifying calculations, and soldering connections with a perf-board
- Iteratively prototyped, 3D-printed, and tested various 3D-models and fits for the test fixture and temp. chambers

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

- Contributed to the set-up of Mobile Camera Units, enabling remote locations across Ontario to capture driver's licenses, by performing UAT, discovering and debugging edge cases, and documenting procedures
- Wrote Python and SQL scripts to verify, format, and transfer driver data across 4 apps using the pyodbc module
- Developed tests for .NET and WebLogic apps using NUnit, and SoapUI, WSDL, XML, and XSD files, respectively
- Created full wikis, WebLogic domains, and config. docs for 7 apps from scratch, reducing onboarding time by 90%

PROJECTS

Multiplexer Control Node (UWaterloo Autonomous Car Team) — *YAML, ROS, CAN, Docker, Linux*

- Developed the logic for a 2-to-1 MUX control node to parse CAN bus messages by using ROS and YAML config files, giving control of the car to either autonomy or the manual joystick publishers

Battery State-of-Charge PCB (UWaterloo Solar Car Team) — *Altium, Analog Design*

- Created and assembled a Current-Sense PCB for a known shunt resistor and battery, by using Altium, decoupling capacitors, vias, and noise consideration

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

- Automated the retrieval of test results by using a color sensor that detects red (fail) results with a camera that captures the images of the failed tests, fully eliminating human supervision
- Programmed C++ code to interface the camera and color sensor by using SPI, I²C, PTP, and a USB host shield

Coffee Can Antenna Radar — *RF, Radar, Analog Design, MATLAB, Audacity*

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

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

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

ACHIEVEMENTS

- Won 1x Gold and 3x Silver for Team Canada Dragon Boat 18U at the 2023 World Championships against China, USA, Thailand, Australia, Ukraine, and India