# Evan Li

ez3li@uwaterloo.ca
github.com/HappyRedMapleLeaf
linkedin.com/in/evan-zc-li
happyredmapleleaf.github.io

## SKILLS

**Firmware/Embedded:** C, C++, STM32, Raspberry Pi, BeagleBone, CAN, I²C, USB, Ethernet, FreeRTOS, Embedded Linux

**AI/ML:** Python, TensorFlow, Torch, NumPy, HuggingFace, OpenCV, nltk, SpaCy, Large Language Models

**Hardware:** Soldering, PCB Schematics, VHDL, Oscilloscope, DMM

**Other:** Python, Bash, Java, JavaScript, SQL, Git, GitHub, React, Node.js, Docker, Kubernetes, AWS (S3, EC2, EKS), Jira

## EXPERIENCE

**Core Firmware Member** — *UWaterloo Formula Electric*🔗 Sept 2023 - Present

- Wrote **C** firmware for **I²C** communication between BMI088 IMU and custom **STM32**-based telematics control unit
- Prototyped CAN message logging through **SDIO** to a microSD card, handling 1000+ messages per second
- Added circuitry and firmware to power distribution unit's **HIL testing** board to imitate DC-DC power supply toggling
- Fixed dashboard button detection and double-click issues in dashboard control unit firmware and **embedded Debian** UI scripts
- Implemented APPS/brake pedal plausibility check with **FreeRTOS** to ensure safety in case of accelerator pedal failure

**AI/ML Engineering Co-op** — *Eon Media Corp.*🔗 Jan 2024 - Apr 2024

- Led backend development of journalist assistant product from inception to customer demo using **LLMs** and **NLP** algorithms
- Reduced cost of newscast **video processing** pipeline on distributed Amazon **EC2 Kubernetes** cluster by **~41%**
- Saved up to an hour of work per day using **Bash** and **Python scripts** to deploy code, preprocess data, and validate results
- Created and optimized video encoding, object detection, and text detection algorithms using **FFmpeg, OpenCV**, and **Torch**
- Containerized scripts and algorithms with **Docker** to facilitate debugging, scaling, and reuse within pipelines

## PROJECTS

**FreshGuard** — C, STM32, PWM, ADC🔗

- Developed a milk bag holder that alerts users to potential spoilage by monitoring temperature, time out of the fridge, etc.
- Wrote **C** firmware for **STM32** MCU to interface with three analog sensors via **ADC** and generate buzzer melodies with **PWM**
- Documented full engineering design process, from needs assessment and functional requirements to safety analysis and testing

**"HAZARD 2.0" Competitive Robot** — Path following, Motor control, Java, OpenCV, TensorFlow🔗

- Led team Devolotics to place **1st out of 73** Ontario teams for the FIRST Tech Challenge; competed in World Championships
- Wrote **autonomous** and **driver-controlled** programs for a robot with 7 sensors, 15 motors, and a camera
- Detected game objects and april tags with **OpenCV** and **TensorFlow** while ensuring <20ms loop time

**Portfolio Website** — JavaScript, TypeScript, React, 3D Rendering, CSS, HTML🔗

- Constructed a mobile-friendly *website* in 10 days with a dynamic **3D .obj wireframe renderer** built from scratch

**Multiplayer Snake** — JavaScript, Node.js, Express.js, AWS

- Recreated the popular Snake game for two players (or one player and a bot) seamlessly on separate computers/browser tabs
- Created **REST API** to send and receive player data, hosting the backend on **AWS** with **Node.js** and **Express.js**

## EDUCATION

**Bachelor of Applied Science in Computer Engineering** — *University of Waterloo* Sept 2023 - Present

- **96.5% cumulative GPA**
- **Relevant Courses:** ECE140 - Linear Circuits; ECE124 - Digital Circuits and Systems