Adrian Ho

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Technical Skills

Languages: C/C++, Python, ARM Assembly, Javascript, Java, HTML/CSS
Frameworks and Tools: Git, Arduino, Linux, J-Link, UART, I2C, RTOS, React, Node.js

Experience

Firmware Developer Jan 2024 – Apr 2024
Onsemi *Waterloo, Ontario*

- Implemented **PWM and Watchdog drivers** adopted from **Automotive Open System Architecture** (AUTOSAR) standards, increasing duty cycle modulation accuracy to **95%** and reducing system failures by **60%**
- Designed and developed an interface for a low power **analog front end** (AFE) sensor to read and write calibration data to flash memory using **Tag-Length-Value** (TLV) encoding, reducing startup time by **98%**
- Optimized the bootloader for an **ARM Cortex M33** processor to enable **Root of Trust** secure application boot up and download through **UART**, **firmware over the air** (FOTA), or **SPI**, decreasing boot time by **30%**

Firmware Developer July 2023 – Sep 2023
UW Orbital *Waterloo, Ontario*

- Created an address generator function for the **AX.25** data link layer protocol, allowing radio communication to multiple ground stations and increasing data transmission speeds by **15%**
- Developed a driver for a **Watchdog Timer** in a **Real-Time Operating System** environment to trigger system interrupts on a **RM46** microcontroller, increasing system reliability by **50%**
- Performed comprehensive **unit testing** on codebase to validate exception handling capabilities for the AX.25 protocol, resulting in a **99%** reduction in software bugs and increased overall system stability

DevOps May 2023 – Aug 2023
DATA Communications Management *Brampton, Ontario*

- Developed a **Powershell** program to automate server monitoring by pinging servers periodically, decreasing the speed of task by **85%** and to maintain an up-to-date active server list.
- Created network diagrams using **Microsoft Visio** for 14+ DCM locations and Azure Virtual Networks, to decrease network troubleshooting times by **60%**

Hardware Developer Sep 2022 – Jan 2023
Midnight Sun Solar Car Team *Waterloo, Ontario*

- Designed printed circuit boards for the Battery Management System Carrier using **Altium Designer** to increase the speed of firmware implementation and accuracy of a current sensor by **50%**
- Searched and added new I/O expanders and kill switches on Digi-Key for the **Altium 365** component library to decrease the time to search for parts

Projects

Taser Chess | *C++, Javascript, Arduino, React, Node.js, Express.js, Sockets.io*

- Developed a chess robot that provides real-time feedback through electrical shock from a TENS Unit controlled by an **Arduino** when a player makes a sub-optimal move
- Implemented web sockets using **Sockets.io** with a **Node.js** server to handle game logic, board evaluation, and bidirectional communication between the **Arduino serial port**, a **React** webpage, Stockfish chess engine
- Integrated reed sensors and magnets to track the positions of chess pieces on a physical chess board to display the current board state and score on a **React** webpage in real time

Markhov Music | *C++, Markhov Chains*

- Developed a transition matrix utilizing **binary data parsing** to effectively model the distribution of notes and rhythms in a MIDI file
- Created two transition matrices for **Markhov chains** to generate unique sheet music using the Lilypond Module in under 20 seconds

Education

University of Waterloo Waterloo, Ontario
Candidate for Computer Engineering Honours, Dean's Honours List *Expected Apr 2027*

- **Extracurriculars:** YRHacks 2021 Best Bot/AI, Hack the Valley Finalist