

Hossein Molavi

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EDUCATION

University of Waterloo

Waterloo, ON

Bachelor of Applied Science in Computer Engineering (Honours, Co-op)

Sept 2021 – Aug 2026 (Expected)

- **Relevant Courses:** Real-Time Operating Systems, Embedded Microprocessors, Computer Architecture, Systems & Concurrency, DSP

TECHNICAL SKILLS

Languages: C, C++, Python, Bash/Shell, Verilog, ARM Assembly, Java

Hardware/MCUs: STM32, ESP32, nRF, Arduino, ARM Cortex-M, PIC16F887, Raspberry Pi

Protocols: Bluetooth Classic/LE Audio, NFMI, I2C, SPI, UART, CAN, MQTT, USB, TCP/IP

Tools: FreeRTOS, Zephyr, GDB/JTAG/J-Link, CMake/Make, Git, Docker, AWS IoT Core, PlatformIO, KiCad, Linux

Testing: CppUTest, gcov, Pytest, Ellisys BT Analyzer, hardware-in-loop testing

EXPERIENCE

Wireless Software Intern

Sept 2025 – Present

onsemi

Waterloo, ON

- Hardened NFMI driver by resolving DMA race conditions causing RX buffer overruns and corrupt audio payloads
- Built wireless audio interfaces supporting HFP/A2DP profiles with mSBC and CVSD codec integration
- Developed NfmiManager for ear-to-ear audio forwarding with SBC frame fragmentation and PLC insertion
- Engineered BinauralManager for guaranteed payload delivery with ACK-based retransmission protocol
- Wrote 200+ unit tests using CppUTest/gcov achieving 100% code coverage across NFMI application modules
- Captured HCI logs and Ellisys sniffs to reverse-engineer BT Classic/LE Audio in commercial earbuds

Founder & CTO

Apr 2025 – Present

Asymptote Labs Inc – Anti-Drone Defense Systems

Waterloo, ON

- Founded defense startup building real-time turret system integrating YOLO detection with motor control
- Designed 4-byte UART protocol with state-machine parsing for low-latency Python-to-Arduino commands
- Engineered converging control system converting pixel offsets to stepper pulses via FOV-calibrated mapping

Embedded Firmware Intern

Jan 2025 – Apr 2025

Wrmth Corp.

North Bay, ON

- Engineered ESP32 firmware in C integrating secure BLE/Wi-Fi connectivity via MQTT and AWS IoT Core
- Implemented secure fleet provisioning using PKI and architected OTA updates within 512KB RAM constraints
- Resolved critical memory leaks by debugging race conditions with JTAG and ESP-IDF memory analysis tools

Embedded Systems Programmer

Aug 2023 – Dec 2023

Midnight Sun Solar Car Team

Waterloo, ON

- Contributed to MSXV solar car firmware; implemented FreeRTOS wrappers for tasks, semaphores, and queues
- Implemented DMA-driven multi-channel ADC on STM32F1 and enabled FPU acceleration, reducing 15% codesize
- Engineered hardware-in-loop test infrastructure for automotive embedded systems validation

PROJECTS

Real-Time Operating System | C, ARM Assembly, STM32

- Built preemptive RTOS with EDF scheduling, PendSV/SVC context switching, and 32KB buddy allocator
- Supports 16 concurrent tasks with priority-based preemption and interrupt-driven lifecycle management

RideSafe – Bike Safety System | ESP32-S3, BLE (NimBLE), FreeRTOS, SPI/DMA

- Built dual-MCU cyclist awareness system with BLE communication, radar sensors, LCD, and haptic feedback
- Implemented DMA-enabled SPI display driver at 80MHz with thread-safe FreeRTOS mutex synchronization

NVS Config (Open Source) | C, ESP-IDF

- Published ESP component providing macro-based type-safe getter/setter APIs for non-volatile storage
- Features declarative configuration with built-in access control and auto-save for production firmware