

MICHAELA CONDARI

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Education

University of Waterloo — Honours Computer Engineering (B.A.Sc)

Sep 2023 – Present

– President's Scholarship of Distinction; Embark FIRST Alumni Scholarship.

Relevant Coursework: Digital Computers; Embedded Microprocessor Systems; Digital Hardware Systems (Assembly Programming, Processors, Memory, I/O, Buses, Peripherals).

Skills and Tools

Languages: C, C++, C#, Python, Bash, RISC-V Assembly, VHDL, SystemVerilog, MATLAB

Tools: STM32, Nios II, ADC, PWM, UART, Oscilloscope, Multimeter, Function Generator, Soldering

Software: Git, Docker, Jenkins, Linux, QNX, QEMU, Quartus Prime, SignalTap, Boost.Asio

Work Experience

Software Development Intern — Ford Motor Company Canada

Sep 2025 – Dec 2025

- Provisioned HIL environments for automotive embedded systems by assembling ECUs, breakout boards, debug tools, and CAN interfaces and performed flashing over serial debug ports using Putty.
- Refactored and optimized Makefiles for multi-platform gtest execution across three ECUs, improving test coverage by 5%.
- Tested Ethernet and socket communication using a console app for loading and managing security tokens and reviewed data parsing while verifying robust error handling across possible connection and data transmission failure scenarios.
- Resolved 2 race conditions in flaky multi-threaded unit tests using Helgrind and C++ concurrency tools, improving CI pipeline stability.

Platform Software Developer — Ford Motor Company Canada

Jan 2025 – Apr 2025

- Improved unit test coverage from 93% to 100% using gtest and gmock.
- Automated unit test execution and reporting using Bash, CMake, and gcovr.
- Replaced a polling-based design with a concurrency-driven solution using condition variables, mutexes, and custom deleters to manage asynchronous weak_ptr lifecycles in a core utility folder used throughout the codebase.
- Refactored ~20 SonarQube code smells by extracting testable helper functions.

Projects

FPGA Audio Player | C, Nios II, Altera FPGA

- Developed firmware to read and decode WAV files from SD card using FatFs, and output real-time audio through Altera Avalon FIFO, enabling responsive playback control.
- Implemented interrupt-driven button handling with timer-based software debouncing, ensuring reliable input and seamless track navigation.
- Used SignalTap logic analyzer to validate debouncing timing and signal integrity, identifying and resolving playback glitches to improve system stability.

Water Reservoir Controller | C, STM32 (Nucleo), ADC, UART, PWM

- Controlled PWM-driven DC motors spinning a wheel to simulate water flow, with a servo motor switching simulated inlet zones via precise duty cycle on STM32 hardware.
- Developed HC-SR04 ultrasonic sensor driver using timer interrupts for echo pulse timing to measure reservoir depth and implemented optical encoder RPM monitoring with timer input capture for reliable low-speed measurement.
- Used an ADC to convert potentiometer input into PWM duty cycle for manual motor speed control.
- Implemented hardware timer-based scheduling for real-time 24-hour irrigation cycles using a custom timer board.
- Connected STM32 UART pins to terminal interface for system configuration and real-time status output.

Concurrent Web Crawler | C, libcurl, pthreads

- Implemented a multi-threaded web crawler using pthreads and libcurl for concurrent URL fetching.
- Coordinated thread synchronization with mutexes and condition variables to safely manage a circular URL queue and graceful termination.
- Designed and maintained a thread-safe visited-URL hash set using POSIX hsearch with explicit memory management, preventing duplicate processing.
- Implemented concurrent file I/O for discovered PNGs, achieving a 16× speedup scaling from 1 to 20 threads.