

Abid Azad

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EDUCATION

University of Waterloo

BASc in Electrical Engineering

Sep 2023 - May 2028

Waterloo, ON

SUMMARY

Electrical Engineering student with four completed co-op terms. Bare-metal Cortex-M4F firmware, drivers written from register maps, VHDL on FPGA, and int8 inference verified bit-exact against an integer reference. Targeting a Winter 2027 firmware, hardware, or silicon co-op.

TECHNICAL SKILLS

Languages: C, C++, VHDL, ASM (RISC-V), Python, MATLAB, Java, SQL, JavaScript

Embedded & EDA: STM32 (bare-metal and HAL), FreeRTOS, CMSIS, Arduino, KiCad, Altium, Quartus Prime, ModelSim, AutoCAD Inventor, COMSOL, VESC

Tooling: Git, Linux, Make, CMake, Ninja, arm-none-eabi-gcc, OpenOCD/ST-LINK, GDB, PyTorch, NumPy

Protocols: UART, SPI, I2C, CAN, ADC+DMA, PWM | **Certifications:** AZ-900, AI-900

Instrumentation: Oscilloscope, SMU, LCR meter, Function generator, Logic analyzer

EXPERIENCES

Software Engineer

May 2026 - Present

Aram Labs

- Build agentic AI products for clients end to end, delivering LLM tool-use workflows, system integrations, and production releases.

Operations & Automation

Jan 2026 - Apr 2026

Hauser Industries

Waterloo, ON

- Delivered 20+ automation, reporting, and ERP improvements in a 4-month co-op term, removing roughly 30 hours of manual work per week across NetSuite, Shopify, and CSV workflows.

Electrical Member

May 2024 - Jul 2024

University of Waterloo Baja SAE Design Team

Waterloo, ON

- Calibrated an ADXL345 accelerometer with Arduino and C++ drivers, improving acceleration-data accuracy by roughly 15%, and integrated 3 electrical subsystems (brake lights, pneumatic switches, differential switches) with the vehicle battery system.

PROJECTS

Cardia: Real-Time ECG Classification | C, STM32F446RE, int8 CNN, PyTorch | **GitHub**

- Built a bare-metal beat classifier on a Cortex-M4F: register-level ADC with circular DMA at 360 Hz, cascaded IIR filters, Pan-Tompkins QRS detection, and a 5,413-parameter int8 CNN, in 15.9 KB flash and 15.8 KB RAM with no vendor HAL and no dynamic allocation.
- Evaluated under the inter-patient ANSI/AAMI EC57 protocol (no patient in both splits): 92.85% beat accuracy and 99.8% QRS sensitivity over 49,691 held-out beats, with the C firmware matching a NumPy integer reference on 50,374 of 50,374 beats under exact int32 equality.

Sentinel: STM32 Sensor Telemetry Hub | C, FreeRTOS, STM32F411, SPI NOR Flash

- Built production-style FreeRTOS firmware across 5 prioritized tasks, acquiring I2C/SPI sensor data from drivers written against the register maps and persisting it to SPI NOR flash through a crash-tolerant, append-only log.
- Designed a versioned CRC-16/CCITT-FALSE telemetry protocol with a resynchronizing streaming parser; builds clean under -Wall -Wextra -Werror in 39.7 KB flash, passing 167 host-test checks.

Self-Balancing Robot | STM32F446RE, FreeRTOS, C, IMU, CAN, KiCad

- Developing FreeRTOS control firmware with IMU sensor fusion, encoder feedback, and a 1 kHz PID loop, plus UART telemetry, a CAN expansion interface, and a multi-rail KiCad power board.

Traffic Light Controller | VHDL, LogicalStep FPGA, ModelSim, Quartus Prime

- Designed and synthesized a Moore FSM in VHDL controlling a three-way intersection, integrating timers, synchronizers, and holding registers; verified in ModelSim and confirmed timing and sequencing on the FPGA via Quartus Prime.