

ADAM DIA

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EDUCATION

Bachelor of Applied Science in Computer Engineering

09/2022 - Expected 05/2027

University of Ottawa | GPA: 3.7/4.0

- **Relevant Coursework:** Computer Architecture I & II, Digital Systems I & II, Computer Systems Design, Operating Systems, Electronics I, Signals & Systems, Control Systems.

TECHNICAL SKILLS

Languages: C, C++, Python, VHDL, Java, Bash

Hardware & MCUs: STM32 (ARM Cortex-M), ESP32, RP2040, Altera FPGAs, Raspberry Pi, Teensy

Protocols & Interfaces: UART, I2C, SPI, RS-485, Modbus, RS-232, TCP/IP

Tools & Hardware: KiCad, EasyEDA, PCB Layout & DFM, PlatformIO, OpenCV, Oscilloscopes, Multimeters, Linux, Git

EXPERIENCE

Apidae Systems | Founding Hardware Engineer

09/2025 - 03/2026

- Designed modular PCBs in **KiCad** and **EasyEDA** for agricultural data loggers, interfacing **RS-485 / Modbus** sensors (wind, temperature, humidity) and an **ESP32 MCU**.
- Transitioned prototyping to automated **SMT PCBA (JLCPCB)** across **20+ boards**, and several revisions, executing **electrical bring-up** to validate power rails and functionality before code deployment.
- Architected an off-grid solar data logging station for an Arctic research project, integrating **Victron MPPT controllers**, relay logic, and **IP-rated enclosures rated to -40°C**.

Synopsys | Hardware Validation Engineering Intern

05/2024 - 08/2025

- Debugged clock generator and **DDR PHY IP** configurations by developing **Python** scripts to parse register dumps and verify PLL frequency calculations against hardware datasheets.
- Automated validation workflows across a board farm of **60+ post-silicon evaluation boards** serving **300+ global engineers**, replacing manual test routines with automated scripts.
- Standardized **Python test environments** and dependency pipelines, resolving Jira issue tickets across the post-silicon validation software suite.

Kelpie Robotics | Electrical Lead & Embedded Developer

09/2022 - 06/2025

- Directed **15 students** designing ROV electronics, including a **1500W power distribution board** (48V to 12V/5V rails) for brushless ESCs and a **Raspberry Pi sensor HAT** with leak detection.
- Developed a low-latency **UART-to-TCP communication bridge** in **C** between an **STM32 Nucleo** and a **Raspberry Pi** to stream thruster controls and sensor telemetry.
- Implemented an underwater photogrammetry pipeline for autonomous coral reef mapping during competition tasks.

PROJECTS

ESP32 Wi-Fi Smart Light Controller %

C++, PlatformIO, KiCad, ESP32, REST API

- Designed a mixed-voltage **120V AC / 3.3V DC PCB** in **KiCad** with high-voltage isolation clearances, driven by a non-blocking **C++ cooperative superloop** to eliminate heap fragmentation.
- Implemented an asynchronous web server and **REST API** with **NTP synchronization**, utilizing thread-safe stream parsing for automated schedule management.

Mixy: Hardware Audio Balance Controller %

C++, Python, PlatformIO, RP2040, Linux, systemd

- Developed **RP2040 firmware** in **C++** using **PlatformIO** and **TinyUSB** to sample analog potentiometer inputs and stream telemetry via plug-and-play **USB Serial**.
- Built a **Python daemon** running as a **systemd** service interfacing with **Linux PipeWire** virtual sinks for real-time audio crossfading with zero perceived latency.

Yarvis: Augmented Reality Interactive Workstation %

C++, Python, OpenCV, MediaPipe, Linux

- Engineered an interactive AR workstation tracking hand landmarks for touchless input using a **Kinect V2** depth sensor and Google **MediaPipe**.
- Built a high-performance **C++ backend** on an **Intel N100 Mini PC (Ubuntu)** for sensor access paired with a **Python/OpenCV** pipeline for dynamic UI rendering.

FPGA UART Transmitter & Interface %

VHDL, Intel Quartus II, Altera FPGA, RS-232

- Designed and synthesized a custom **UART transmitter** using a **Finite State Machine (FSM)** in **VHDL** deployed onto an **Altera FPGA** via **Intel Quartus II**.
- Prototyped an **RS-232 transceiver** circuit and validated packet framing, start/stop bit timing, and baud accuracy using an **oscilloscope** and USB converter.

LEADERSHIP & INVOLVEMENT

Technical Coordinator | IEEE uOttawa Student Branch

09/2025 - Present

- Organized and taught technical workshops for **75+ students** on **C programming**, **KiCad PCB design** (schematics, footprints, layout), and bare-metal **embedded development** using **direct register manipulation**.
- Assisted engineering students with hands-on troubleshooting and operating lab equipment, including **oscilloscopes**, **power supplies**, and **multimeters**, for course assignments and projects.