Yaseen Mohamed

BASc. Mechatronics Engineering | University of Waterloo

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Skills

Software/Programming: C/C++ (embedded), Python, MATLAB, VHDL (FPGA), Java, Git, SQL.
Embedded/Electronics: STM32, Linux, Arduino, Raspberry Pi, FPGA/PLC, MUX, PCB/circuit design, micro-soldering, sensors/signals, Vicon.
Interfaces/Protocols: I^2C, SPI, UART, Wifi, Bluetooth.
CAD/Prototyping: SolidWorks, Inventor, AutoCAD, GD&T, SimulationX, 3D printing (FDM/SLA/SLS), shop tools.

Experience

Embedded Software Engineering Intern   Sept - Dec 2025
Aversan Inc.
- Helped develop **safety-critical** aerospace equipment by debugging, extending, and testing low-level **STM32H7 embedded C firmware**, maintaining **version-controlled** changes, and ensuring alignment with **DO-178** coding standards.
- Built **5 GUI Python tools** using **PEP 8** to help develop and debug various firmware aspects, communicating with the MCU over **UART** and analyzing output, uncovering tens of bugs, facilitating firmware verification, and reducing testing time by **70%**.
- Built a JTAG boundary scan solution by developing a Linux-based Python GUI using open-source tooling to test MCU pin soldering (no shorts) and validate board connections, catching production faults early and reducing rework/diagnosis time.
- Wrote C firmware for STM32H7 MCU to communicate with board components through **I^2C** and report status over UART, improving accuracy and reducing component testing time by **90%**.
- Built I/O test suite for a safety-critical device using **ROBOT framework**, via **RIDE**, on **Linux**-based **Automated Test Equipment**, to verify I/O set/read and generate reports for debugging, **FAA certification**, production verification, and maintenance.

Engineering Research Assistant   Jan - Apr 2025
University of Waterloo School of Optometry and Vision Science
- Built a custom footstep-detecting device using an **Arduino**, **multiplexer** (**48 analog signals**), **Raspberry Pi**, **custom PCB**, and pressure-resistive sheets.
- Wrote **C++** sensor data-collection code with long-term decay compensation and modified **Raspberry Pi** CSV export code, increasing sampling frequency by **99%**.
- Built a **Python GUI** to visualize pressure-change positions, using an **algorithm** to group data into analysis-ready results.
- Designed/fabricated research equipment upgrades using **SolidWorks** and **FDM 3D printing**, cutting setup time by **80%**.
- Created a detailed **technical report** and **user guide** to support reproducibility and ongoing development for all equipment.

Motion Capture Undergrad Research Assistant   Sept - Dec 2024
University of Waterloo RoboHub
- Calibrated the **Vicon camera array** and attached reflective markers per the Plug-in Gait protocol for precise spatial tracking.
- Monitored live capture at 200 Hz, fine-tuning camera exposure and threshold settings to minimize occlusions and ambient noise.
- Processed recordings in **Vicon Nexus**: labeled marker trajectories, applied spline-based **gap filling** and **low-pass filtering**, and exported cleaned files ready for biomechanical analysis.

CNC Programmer   May - Aug 2024
State Windows Corporation
- Designed complex sheet metal models using **Autodesk Inventor** and used its spreadsheet option to make **hundreds** of parts with different dimensions.
- Selected the appropriate **CNC machine**, converted models into **CAD drawings**, then generated **G-code**.
- Solely handled a main, high-priority job schedule, with jobs requiring **700+ parts**.
- Made multiple **SOP** (Standard Operating Procedure) handbooks to increase training quality and standardize basic processes.
- Trained new hires, ensuring their complete understanding of the process and ability to finish jobs independently.

Projects

EV3 LEGO Prosthetic Hand | ⍾ Git · 🎥 Demo | C, SolidWorks, 3D Printing   Oct - Dec 2023
- Built a functional prosthetic hand in **C** using LEGO EV3 parts for controlled object handling as a hand replacement.

Quadcopter Prototype | ⍾ Git · 🎥 Demo | C++, PCB/wiring, closed-loop control   June - Aug 2020
- Built a ground-up quadcopter prototype using **closed-loop control algorithms (PID)** programmed with **C++** on **Arduino**, and **prototype circuit boards** to control propeller speed based on **gyro sensor** output.

Education

University of Waterloo, BASc. Mechatronics Engineering   GPA: 3.9 Excellent standing   2023 – Exp. 2028
Relevant Coursework: MATLAB, Embedded C, Digital Logic, Algorithms/Data Structures (C++/C), OS/RTOS, Circuits, Mechanics of Solids, Statics/Dynamics, Statistical Analysis, Sensors and Instrumentation.