Yaseen Mohamed

Basc. Mechatronics Engineering | University of Waterloo

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SKILLS

Software/Programming: C++/C, Java, SQL, GitLab, Python (GUI), MATLAB, VHDL (FPGA), RobotC.

Electronics & Embedded Systems: Arduino, Raspberry Pi, PLC programming, FPGA development, STM32, PCB/circuit design, MUX programming, Micro soldering, Vicon motion capture, Sensors & signals.

CAD & Prototyping: AutoCAD, SolidWorks, Inventor, GD&T, Freehand sketching, FDM 3D printing, Tool usage, Hardware building, Machine shop tools.

Communication: Technical writing, Fluent in English & Arabic.

EXPERIENCE

Engineering Research Assistant   Jan - Apr 2025

University of Waterloo School of Optometry & Vision Science/Waterloo Eye Institute

- Designed and built a custom footstep-detecting sensor-based device, using an **Arduino** microprocessor, with a **multiplexer** to handle up to 48 analog signals, alongside a **Raspberry Pi**, a **custom PCB**, and pressure-sensitive sheets.
- Wrote **C++** code to interface and collect data from custom pressure sensors, eliminating the long-term decay effects on sensors, and modified Raspberry Pi code to export CSV files, increasing the sampling frequency by **99%**.
- Built a **Python GUI** program to plot the points of pressure change as positions on the equipment layout, producing results in a form accessible to researchers, and built an **algorithm** that groups position data to be visually understandable.
- Designed and fabricated mechanical enhancements to the research equipment using **SolidWorks** and **FDM 3D printing**, decreasing setup time for each trial by **80%**.
- Created a detailed **technical report** and **user guide** to support experimental reproducibility and ongoing development for all equipment.

Motion Capture Undergrad Research Assistant   Sept - Dec 2024

University of Waterloo RoboHub

- Calibrated and configured the **Vicon camera array**, then attached reflective markers to participants following 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 appropriate **CNC machine**, converted models into **CAD drawings**, then generated **G-code**.
- Solely handled one of the main, high-priority job schedules of the company, 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 Kit Prosthetic Hand   Oct - Dec 2023

- Designed and programmed a functional prosthetic hand using **C**, capable of controlled object handling to act as a replacement for human hand.

Quadcopter Prototype   June - Aug 2020

- Built a ground up quadcopter prototype using **closed-loop control algorithms** programmed using **C++** on **Arduino**, and **prototype circuit boards** to control propeller speed based on **gyrometer sensor** output.

Hospital Database   July 2022

- Built a test **database** using **SQL** formatted for a hospital to store and link all the sufficient information together.
- Ran tests using fictional, well-structured data, ensuring full functionality of the system.

EDUCATION

University of Waterloo, BASc. Mechatronics Engineering   91.4% Dean's Honour List   2023 – Exp. 2028

Relevant Coursework: Microprocessors and Digital Logic, Algorithms and Data Structures (C++/RobotC), Circuits, Materials Engineering, Mechanics of Deformable Solids, Statics & Dynamics, Statistical Analysis, Sensors and Instrumentation, Real-Time Systems, MATLAB.

CERTIFICATIONS

CCNAv7: Introduction to Networks	2022
WHMIS 2015 (SO2017)	2023