



MUHAMMAD FAHMY

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SUMMARY

Hi, I'm mechatronics engineer, with multidisciplinary experience that extends to embedded systems, software, electronics, manufacturing, high power systems, quality management, and mechanical design. I have always had a natural curiosity for software, robotics and automation. Recently, I have been learning React.js, Java, DSA, and ROS2.

SKILLS

Software

- > JavaScript ES6
- > Node.js / React.js / Express.js
- > HTML / CSS / SCSS
- > SQLite / MongoDB
- > Python
- > Flask / Django
- > Java
- > Arm Cortex-M4, nRF52, STM32F4
- > Linux-based Microprocessors, IoT
- > C / C++ / CMake / G++
- > SPI / I²C / UART / ADC
- > RTOS (Zypher / FreeRTOS)
- > Embedded HAL
- > Bluetooth Low Energy
- > Git

Hardware

- > Solidworks / PDM / FEA
- > GD&T
- > DFMEA / PFMEA
- > DFM / DFA
- > Plastic Injection Molding
- > 3D Printing (FDM / SLS / Mjet)
- > Statistical Tolerance Analysis
- > Root Cause Analysis
- > Proteus / LT Spice
- > MATLAB / Simulink
- > Ladder Logic / PLC
- > AC and DC Power Systems
- > LabView

WORK EXPERIENCE

Embedded Software Engineer - Vital Sense

Jan 2023 - Present

- > Worked on an innovative over-ear health monitoring device to track real-time vitals including heart rate, body temperature, blood oxygenation and blood pressure using technologies such as BCG, ECG, and PPG
- > Created a data equations modules in C for PPG, IMU, temperature sensors and ADC over I2C and SPI to update and send signals 100 times per second per sensor
- > Engineered a custom GATT service and communication module in C for efficient data transfer between peripheral and central devices over BLE for a longer battery life
- > Implemented multi-threading, utilizing mutexes and semaphores in C to optimize efficiency and enable adaptive sampling rates per sensor
- > Develop a Python application utilizing OOP and the QT framework for GUI creation, capable of acquiring data from peripheral device, storing it in a CSV file, and facilitating data visualization through graphical plots

Systems Engineer Co-op - Schneider Electric Solar

Sep 2022 - Apr 2023

- > Planned the end-to-end smart inverter test lab, including creating systems SLDs, material procurement and building the lab while maintaining system-level operational requirements
- > Developed test plans, and test cases with comprehensive guidelines from functionals requirement and design specifications for automated HIL testing
- > Integrated a new sub-system into inverter to monitor electricity generation, and consumption
- > Conducted comprehensive testing of cloud APIs, ensuring seamless integration, compatibility, and functionality across various operational environments

Mechanical Designer Co-op - Motorola Solutions

Sep 2021 - Apr 2022

- > Introduced innovative assembly processes and modelled tooling using CAD for new products, utilizing poka-yoke technic to ensure error-proofing and optimize efficiency
- > Utilized Agile management tool to track product lifecycle, document components, and communicate changes with suppliers as well as logistics
- > Implemented a new testing process for cameras employing 8D which increased the yield rate by 87% and eliminated false rejects
- > Prepared detailed production-quality fabrication drawings using GD&T and assembly manuals
- > Designed experiments and tools for testing products such as Field of View and IK 11 tests
- > Gained comprehensive experience with SLS/FDM 3D printing and other machine shop tools

Process Engineer Co-op - Ballard Power Systems

Jan 2020 - Sep 2020

- > Boosted cell manufacturing efficiency by implementing lean manufacturing techniques such as 5S, Kaizen and smart KPIs
- > Conducted monthly VDA 6.3 automotive audits, including project management, and process/product planning to maintain a functional quality management system
- > Utilized DAMIC, 8D, and data analysis tools while working on several Quality Control Reviews, reducing failure rates and improving repeatability and reproducibility based on customer feedback
- > Worked closely with manufacturing personnel and manufacturing engineers to ensure consistent. production yield



MUHANNAD FAHMY

EDUCATION

SIMON FRASER UNIVERSITY
Vancouver, BC (2017-2023)

- > Major in Mechatronics Systems Engineering
- > Minor in Applied Mathematics

AWARDS

- > **First place** in FAS competition, the most prominent engineering competition hosted by SFU 2019
- > **First place** in SFU senior Engineering competition, **two years** in a row (2019-2020)
- > **Second place** in Western Engineering Competition, the biggest competition over western canada (2021)

VOLUNTEERING

VP Communications - Western Engineering Competition

- > Empowered +250 engineers to take their skills outside the classroom and apply them to unique and memorable challenges
- > Created all the branding, visuals, packages for WEC23
- > Designed and sourced the merch needed while keeping everything within budget, creating a \$10,000 revenue
- > Managed a team of four under an extremely stressful timeline successfully

Mechanical Designer - Team Guardian at SFU

- > Designed a modular system for our main drone utilizing SolidWorks to allow for easy troubleshooting, adjustability and upgradability

PROJECTS

Harvard Introduction to Web Development

Apr 2022 - Sep 2022

- > Build an image manipulation app with features such as edge detection, Grayscale, horizontal, vertical reflection and blur features in C
- > Built a mockup stock trading website using Flask, Python, SQLite, CSS and HTML that gets live stock prices from iexcloud API and allows beginners to trade in a safe controlled space

4-DOF SCARA Robot Arm

Jan 2020 - Sep 2020

- > Developed a mathematical model for the robot arm, including D-H notation, forward and inverse kinematics
- > Programmed a path planning algorithm in C++ that controls speed and acceleration based on different methods such as cubic splines, parabolic bending, and single polynomial
- > Utilized GitHub to easily communicate, update and edit the code with my peers

Power Supply and Function Generator

Jan 2020 - Sep 2020

- > Built a dual-channel, low-cost, USB-powered power supply and function generator, with both software and hardware interface for SFU senior design competition, and achieved the First Place in SFU Senior Design Competition
- > Designed the schematics of the circuit to supply $\pm 5V$ simultaneously, and the function generator can output square, sine, and triangle signals, then simulated it using Proteus
- > Designed and Programmed GUI using Python and QT framework

Green Robot - Automated Garbage Collector

Nov 2018 - Feb 2019

- > Designed an eco-bot for a competition that is capable of collecting unsorted waste and tasked to differentiate between objects and avoid potential obstacles on a tight budget, and achieved achieving the first place
- > Designed and Fabricated the robot utilizing SolidWorks and Rapid Prototyping Techniques; Sourced components and successful integrated software and hardware.

Certificates

Siemens Mechatronic Systems Certification Program

Apr 2018 - SEP 2018

- > Inspected and simulated complex hydraulic and pneumatic systems using datasheets, circuit diagrams, displacement step diagrams and function charts
- > Applied troubleshooting strategies to identify, localize and correct malfunctions
- > Programmed and Troubleshot SIMATIC S7-300 PLCs in a complex mechatronic system

Lean 6-Sigma Green Belt Certification

Aug 2020

- > Delivered a 6-sigma project that simulates a production problem in which tools such as cost of poor quality, fishbone analysis, priority/decision matrix and production KPIs were applied
- > Learned the different phases and tools of lean 6 sigma projects in addition to how and when to employ it

Rapid Prototyping & Quality Control

May 2019 - Jun 2019

- > Gained fabrication experience using various manufacturing processes (Drilling, Milling, Lathe etc..)
- > Practiced post-processing skills, used CMM to analyze the quality of the prints to create inspection reports