

MOHAMMED SAMER ALHAFFAR

📞 647-466-6495 ✉ samer.haffar93@gmail.com [in linkedin.com/in/samhf](https://www.linkedin.com/in/samhf) [ePortfolio](#)

Highlights of Qualifications

- Mechanical Engineering graduate with **2 years** of internship experience in the aerospace and defense industry, specializing in manufacturing process engineering.
- **Process Improvement & Savings:** Led and contributed to lean manufacturing projects, delivering over \$200,000 in annual cost savings through process optimization and custom tooling design.
- **Mechanical Design & Simulation:** Proficient in 2D/3D modeling, sheet metal design, assembly, and technical drawings using SolidWorks and CATIA to design, validate, and optimize complex components.
- **Design for Excellence (DFX):** Skilled in applying DFM, DFA, and DFC methodologies, along with GD&T (ASME Y14.5) and tolerance analysis, to mitigate design risks and enhance manufacturability.
- **Technical Documentation:** Experienced in creating and managing essential engineering documents, including Manufacturing Process Instructions (MPIs), SOPs, and comprehensive technical reports.

Education

York University

Toronto, ON

Bachelor's of Engineering in *Mechanical Engineering*

September 2020 - August 2025

Skills

- **Engineering Tools:** SolidWorks, CATIA, Fusion 360, AutoCAD, Ansys: Fluent, StarCCM+: CFD - FEA, LabVIEW.
- **Process & QA:** PFMEA, GD&T (ASME Y14.5), Six Sigma, Root Cause Analysis.
- **Programming:** VBA, Google Apps Script, Arduino IDE, Python, MATLAB, Minitab, G-Suite, MS Office.
- **Manufacturing & Prototyping:** 3D Printing, Laser Cutting, Soldering, CNC Milling, Lathe, Band Saw.

Work Experience

Manufacturing Process Engineering Intern - Aerospace & Defense

May 2023 - April 2025

Celestica

Newmarket, ON

- Supported manufacturing and inspection activities for Class 3 low-volume PCB assemblies, ensuring compliance with **CGP, ITAR, ISO 9001, IPC J-STD-001, IPC-A-610, and IPC/WHMA-A-620** standards for quality, soldering, wiring, and documentation control.
- Optimized and documented PCB manufacturing processes for **100+** exciting and NPI products in PTH, Manual/Mechanical assembly, ERSA, and Wave Soldering, improving efficiency using **lean manufacturing and reducing defects using PFMEA**.
- Designed and validated **35+** custom tooling and fixtures in SolidWorks to optimize different processes, ensuring compliance with GD&T and DFM principles. The major designs reduced assembly time by 30 min per product, leading to **\$140,000 +** annual savings.
- Updated and maintained Manufacturing Process Instructions (MPIs), BOMs, and technical reports in support of **engineering change processes**.
- Collaborated closely with cross-functional teams, including AOI, AXI, bonding, wash, hand soldering, and coating to ensure product and process quality across departments.
- Initiated and implemented **continuous improvement** projects, such as automating kitting and component preparation by eliminating repetitive tasks and reducing order setup time with an annual potential saving of **\$60,000**.
- Executed **preventive maintenance** procedures on solder fume extractors, label printers, and torque screwdrivers to sustain their ongoing operational efficacy and durability.

Accreditation & Quality Assurance Assistant

September 2022 - April 2023

Lassonde School of Engineering • York University

Toronto, ON

- Collected and tracked 50+ course materials of the Earth Science and Space Engineering programs required for the accreditation exercises to be reported to the Canada Engineering Accreditation Board.
- Supported committees by circulating materials, organizing workshops, and minute taking. Co-created the Lassonde accreditation Private Portal for all engineering programs.

Research Mentor - Co-op Student

May 2022 - August 2022

k2i Academy

Toronto, ON

- Supervised and provided guidance to a team of 8 high school students in researching the impact of elevated coefficient of friction on various surfaces' materials.
- Constructed and implemented research tools to develop an Automated Salt Allocating prototype to effectively remove ice accumulation in residential backyard areas.
- Taught various engineering principles and skills, such as CAD design, research methodologies, presentation skills, electric circuits designing, and coding on Micro;Bit.

Projects

CFD & FEA Analysis of a Hurricane Evacuation Sign

Winter 2025

- Executed CFD simulations to quantify aerodynamic forces on a sign under hurricane winds up to 70 m/s and validated against theoretical data.
- Used FEA to identify high-stress zones, redesigned support structure reducing displacement by 96% and increasing Factor of Safety from 4.5 to over 14.
- Analyzed flow-induced vibration risk by comparing natural frequency to vortex shedding frequency, identifying resonance risk at 62 m/s.

Biodegradable Drone Airframe

Fall 2024

- Designed a sustainable drone airframe for land surveying using biodegradable PLA/jute composite.
- Optimized structural performance by simulating 8 laminate layups and selecting a 10-ply design achieving 3.45 Factor of Safety under maximum thrust.
- Created a modular airframe in SolidWorks and specified compression molding to improve strength, reduce moisture absorption, and ensure manufacturability.

IoT Floating Sun-Tracking Solar Panel

Winter 2023

- Designed and fabricated an IoT-based floating solar panel prototype with a 2.5 kg payload and 2-DOF sun-tracking.
- Programmed an Arduino MKR 1010 for real-time monitoring and autonomous sun-tracking via a custom cloud dashboard.
- Conducted FEA on the 3D-printed frame to validate structural integrity under a 3.8 N operational load.

Automated Fish Tank Monitoring System

Fall 2022

- Developed a real-time monitoring system using LabVIEW and an Arduino microcontroller to track critical water parameters including temperature, pH, and water level.
- Engineered an automated control system that activates a heater and a water pump to maintain temperature and water levels within a preset range, ensuring a stable aquatic environment.
- Designed a graphical user interface (GUI) in LabVIEW for live data visualization and implemented an alert system to notify the user of any significant deviations from the optimal conditions.

Extracurricular Activities

Students Refugee Program Coordinator

September 2020 – April 2025

World University Service of Canada

Toronto, ON

- Assisted sponsored refugee students with academics, housing, and well-being upon their arrival in Canada.
- Planned and established tabling and fundraising events, managing one tabling event per week at York University, fundraising an average of 80 \$ per week to help cover sponsored students' expenses.

Mars Rover Mech-Team - Mechanical Designer

May 2022 – January 2023

York University Robotics Society

Toronto, ON

- Worked closely with the Mech Team to understand the design requirements and constraints for the rover to compete in the Canadian International Rover Challenge in Alberta.
- Created detailed technical drawings and assembly instructions for prototype production, specifically, chassis systems and electronic parts storages.

Academic Peer Support Assistant

September 2021 - April 2022

Lassonde School of Engineering • York University

Toronto, ON

- Tutored 50 first-year engineering students enrolled in Renaissance Engineer 1 (ENG 1101).
- Delivered weekly presentations on a variety of topics, including enrollment, study resources, and academic support.

Math & Physics Tutor

September 2020 – April 2021

The Arab Community Center of Toronto

Toronto, ON

- Delivered weekly math homework sessions for secondary school students, grades 7 & 9 using online creative tools.
- Assisted 11th-grade students in Physics, helping to strengthen problem-solving skills and understanding of key concepts.