

Muhammad Arham

2303 Canterbury Cres, Pickering, Ontario | 647 274 2420 | muhammadarham24@gmail.com | www.muhammadarham.ca

SKILLS AND KNOWLEDGE

Technologies: Solidworks, CATIA V5, Solid Edge, Inventor, MicroStation, Mastercam, Ansys, Matlab & Simulink, C, Arduino, MS Office

Knowledge Areas: Chassis systems, vehicle dynamics, automotive aerodynamics, vehicle design, vehicle testing, manufacturing, SPC

EDUCATION

Queen's University

Bachelor of Applied Science – Mechanical Engineering

Kingston, Ontario

September 2015 – April 2020

WORK EXPERIENCE

Honda of Canada Manufacturing

Alliston, Ontario

Product Engineering Intern, Body/Exterior Group (16 Month Professional Internship)

May 2018 – August 2019

- Developed, tested, and implemented design changes and countermeasures to improve and control vehicle performance and quality.
- Worked with R&D and manufacturing departments to solve factory and market problems; ensuring vehicle quality and performance meet the design specifications.
- Performed in-house and market concern root cause analysis, as well as failure modes and effects analysis.
- Projects involved: New model development and testing, mass production vehicle testing, and counter measure development.
- Developed new methods and apparatus for testing vehicles and equipment to evaluate/characterize their performance.

Canadian Nuclear Laboratories

Deep River, Ontario

Designer, Engineering

May 2017 – August 2017

- Worked in configuration management, using various design programs and drafting methods to design/revise assembly, component, system and floorplan drawings/models.
- Performed field walk-downs to determine the necessary updates and to verify drawing accuracy.
- My team exceeded project production targets by over 30% without exceeding the project budget.

Brivada Solutions Inc.

Ajax, Ontario

Marketing and Sales Lead

May 2016 – September 2016

- Consistently surpassed office sales goals by applying marketing and sales techniques and using various forms of customer outreach.
- Facilitated workshops and trained salesmen in leadership, communication, marketing and sales techniques.

EXTRACURRICULAR EXPERIENCE

Queen's Formula SAE Design & Race Team

Kingston, Ontario

Director of Engineering & Chassis Lead

April 2019 – Present

- Responsible for overseeing the design, development, manufacturing, and testing of the Q20 (2019-2020) racecar on top of my Chassis Lead responsibilities.

Chassis Lead

August 2016 – July 2018

- Tasked with designing and manufacturing a new lightweight, high stiffness chassis for an open-wheel race car each year.
- Responsibilities include designing 3D CAD models, ensuring they adhere to the SAE rules/regulations, using FEA to perform structural analysis under various static and dynamic loads, and then performing physical tests to validate models.
- Role requires a solid understanding of chassis design, vehicle dynamics, manufacturing processes of various materials, and the relationships between vehicle systems (suspension, steering, powertrain, aerodynamics, and ergonomics).
- Improvements on the 2017 chassis included increased stiffness, improved driver comfort and egress time, and a much shorter manufacturing timeline compared to 2016.

Queen's Hyperloop Design Team

Kingston, Ontario

Chassis Designer

September 2017 – May 2018

- Helped develop a 1/2 scale pod for the 2019 SpaceX Hyperloop Pod Competition where we placed as the top team from Canada.
- Responsible for the design of the pod chassis as well as the integration of other systems including propulsion and braking.
- Taught vehicle chassis theory, design, modelling and validation, and manufacturing methods to chassis team members.

AWARDS

- **Honda of Canada Mfg. Tech Fest Winner (2019):** My Vehicle Surface Patternator invention was selected as one of the top themes at HCM, it will be presented at the Honda North American Technical Exchange and will be implemented at other plants around the world.
- **W.T. Pound Engineering Design Award (2018):** Awarded to the individual who has demonstrated an exceptional understanding of machine design principles, and an outstanding aptitude for creative and innovative design.
- **Transportation Technology Award (2015):** Awarded to the student who has demonstrated the highest proficiency in the Transportation Technology (Automotive) class.
- **Manufacturing Engineering Technology Award (2014):** Awarded to the student who has demonstrated the highest proficiency in the Manufacturing Engineering Technology class.

ACADEMIC DESIGN PROJECTS

- **Optimized Gearbox** 2018
The goal of this project was to design a 3D printed gearbox to be placed in a standard RC car and compete in a class-wide towing event and timed race event. My group decided to build a 2-speed gearbox, with one gear ratio optimized for towing, and the other optimized for speed. We developed a gear ratio optimizer in Matlab to determine the optimal gear ratio for each event. I was in charge of designing the gearbox and housing. The housing was designed to minimize mass and print time without compromising structural integrity. The housing design was modular with no need for additional hardware or adhesive to secure it and the design was validated using FEA in Ansys. We scored maximum points in the towing competition, towing the full maximum distance, and won the race by a significant margin, thereby winning the overall competition.
- **Hydroelectric Turbine** 2017
The 2nd year Mechanical Engineering design project and competition was to create a hydroelectric turbine using standard DC motors to generate as much power as possible within the given constraints of size and budget. We decided to use a waterwheel style design to generate a lot of torque and use a 3-stage gearbox to convert the high torque input to a high angular velocity output (1:25 ratio). I designed the waterwheel blades to efficiently harness as much kinetic energy as possible without causing excessive splashing, they were also depth-adjustable to control the amount of power generated and ensure proper clearance from the simulated river bed. Our waterwheel generated more power than all other groups combined.
- **Object Grip Device** 2016
My group designed and built an accessibility device for a quadriplegic client that allowed them to pick up and grip objects of various sizes and shapes using their forearm and wrist.
- **Autonomous LEGO Vehicle** 2016
Built and programmed LEGO EV3 autonomous vehicle to follow traffic lanes, automatically manoeuvre around obstacles, reduce speed based on proximity of obstacles, and avoid collisions.

PERSONAL PROJECTS

- **Dune Buggy II** August 2018 – Present
Designing and building a rally-style two seat dune buggy for use off-road and on-track: Double wishbone pushrod-actuated front and rear suspension with adjustable ride height, stiffness, caster, camber, and toe. High strength, lightweight chromoly 4130 spaceframe chassis, designed to keep occupants safe during normal operation and in the event of roll-overs and crashes. Powered by a 1000cc superbike engine with a 6-speed sequential transmission until resources become available for electrification.
- **Turbojet Engine** May 2016 – September 2016
Designed and built a propane powered turbojet engine using components salvaged from a junkyard.
- **Dune Buggy** October 2014 – August 2015
Designed and built a fully off-road capable dune buggy from scratch in high school. Independent double wishbone front suspension, rear single swing arm suspension, 420cc single cylinder OHV engine, CVT transmission, electric start.
- **Go-Karts** February 2012 – October 2014
Built and iterated on multiple go-karts from scratch as a high school hobby.

For more details on these projects (and others), visit: www.muhammadarham.ca