

SEIF HASSAN

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EDUCATION

University of Toronto

Sep 2015 to Jun 2020

Bachelor of Applied Science, Mechanical Engineering | Toronto, Canada

- Cumulative GPA: 3.76/4 (85.73%)
- Streams: Mechatronics, Solid Mechanics and Design
- Certificate in Engineering Business - Rotman School of Management

RESEARCH EXPERIENCE

Undergraduate Research Assistant

Dec 2016 to Apr 2017

University of Toronto Microrobotics Lab | Toronto, Canada

& Sep 2017 to Aug 2018

- Fabricated micro-scale robots that can be used in biomedical applications such as minimally invasive surgeries and targeted drug delivery
- Improved the 3D motion control by modifying the material composition to achieve neutral buoyancy
- Optimized the fabrication process by improving its repeatability, reproducibility and achieving a percent error less than 3% to the target density
- Presented results at a department-wide symposium with more than 90 participants

Undergraduate Research Assistant

May 2016 to Aug 2016

University of Toronto Human Factors and Applied Statistics Lab | Toronto, Canada

- Investigated the social-psychological factors of distracted driving behavior among young drivers by conducting surveys
- Manipulated, analyzed, and presented large datasets from over 100 participants using R and data mining tools
- The study revealed that young drivers overestimated their parents' engagement in and approval of distracted driving, which was positively correlated with their own distracted driving behaviour

PROFESSIONAL EXPERIENCE

Mechanical Engineering Intern

May 2018 to Aug 2019

AGS Automotive Systems | Toronto, Canada

- Designed tooling for manufacturing processes using SolidWorks/Inventor and implemented a universal design to cut-back on cost and material by 75%
- Conducted FEA using ANSYS to analyze failure locations, deflections, and fatigue life cycles on the tooling. Developed drawings and worked with vendors to test and prototype designs from concept to manufacturing
- Reduced manufacturing costs by over \$134,000 by redesigning shipping racks; implemented a universal design and improved the packing density
- Packaging Design: Designed cost-effective packaging layouts, redesigned packaging layouts to optimize density cut-back on cost and material. Supported packaging team with cost estimation for future programs

- Created multiple AutoCAD layouts to automate a metal stamping press using industrial robots to improve the productivity and the quality of the stamped parts, and eliminate non-ergonomic manual handling
- Designed multiple concepts on AutoCAD of an automated unload system for a press line to increase workflow efficiency and reduce costs
- Co-managed over 30 facilities projects by producing project drawings, specifications, and consulting with vendors. Worked on multiple energy-saving projects that resulted in over \$27,000 in annual savings
- Supervised, and mentored 2 incoming interns to transition into the workplace

Mechanical Engineering Intern

May 2017 to Aug 2017

Bombardier Aerospace | Toronto, Canada

- Developed a business intelligence tool using MicroStrategy to reduce resources required to generate monthly fleet performance reports.
- Optimized the user experience and user interface of web-based dashboards and deployed them to mobile devices. Dashboards were used by senior management to monitor the reliability performance of the fleets
- Developed an internal tool on MicroStrategy that allows easier distribution and management of dashboards

POSTER PRESENTATIONS

S. Hassan, M. Salehizadeh and E. Diller, "Fabrication of Near-Neutrally Buoyant Microspheres", Mechanical & Industrial Engineering Graduate Research Symposium, 2018.

LEADERSHIP & EXTRACURRICULAR ACTIVITIES

Junior Design Competitor

Jan 2017 and Jan 2016

University of Toronto Engineering Kompetition

- Designed, tested, and prototyped in a team of 3 a material handling solution for aggregates and a separate project on a transport solution for structural beams

Mechanical Team Lead

Oct 2015 to Mar 2016

University of Toronto Robotics Association – Sumo Bot

- Worked in a 3-person team to build a sumo battle robot to compete in a robot-sumo competition
- Designed a 3D CAD model in SolidWorks and used various tools to drill, cut and machine sheet metal to build the robot

ACADEMIC PROJECTS

Autonomous Robot

Jan 2020 to Apr 2020

Mechatronics Systems: Design & Integration Course

- Worked with a team of 5 students to implement an autonomous exploration and mapping algorithm using C++ and ROS. The robot used a biased random walk navigation with static obstacle avoidance
- Implemented a shortest path planning algorithm to locate objects in a static environment. Then used OpenCV to detect features detection and match images on each object

UV Phone Sanitizer for Hospitals

Sep 2019 to Apr 2020

Capstone Design Course

- Designed, in a 4-person team, a wall mountable UV phone sterilizer for CleanSlate UV to reduce hospital-acquired infections and protect patients with compromised immune systems
- Developed and tested a proof of concept by conducting UX studies, pilot studies, building mock-ups, and analyzing components. The solution killed 99.9% of infectious bacteria and had a payback period of 3.7 months

Heat Distribution Optimization Using MATLAB

Jan 2018 to Apr 2018

Heat & Mass Transfer Course

- Conducted experiments and used MATLAB to determine the optimal configuration of heater blocks and heat sinks that minimizes the surface temperature on a circuit board
- Used MATLAB and finite element method to build a 2D model of the temperature distribution on the circuit board

Foot Pedal Operated Trash Bin

Sep 2017 to Dec 2017

Kinematics and Dynamics of Machines Course

- Redesigned, in a 5-person team, a foot pedal operated trash bin mechanism to reduce the actuating force and time required for the bin to open
- Prepared a CAD model in SolidWorks to simulate and study the mechanism. Conducted a full kinematic analysis; performed a position, velocity, and acceleration analysis using MATLAB

Noise Abatement and Visual Privacy Improvement

Jan 2016 to Apr 2016

Engineering Strategies & Practice Course

- Designed with a team of 5 students a fence addition for a client to reduce noise from air conditioning units and increase privacy
- Followed an engineering design process, including social, environmental, and cost assessment. Proposed a polymer sheet and laser system to decrease noise by up to 85% and block cameras infringing on privacy

CERTIFICATIONS

Six Sigma Green Belt

Mar 2020

Institute of Industrial and Systems Engineers

Introduction to Welding

Nov 2019

George Brown College

Advanced Machining Operations

Oct 2019

George Brown College

The Complete AutoCAD 2016 Course

Apr 2018

Udemy

Basic Machining Operations

Jan 2017

George Brown College

R Programming – John Hopkins University

May 2016

Coursera Course Certificates

AWARDS

Dean's Honours List

University of Toronto

Fall 2015, Winter 2016, Fall 2016,
Winter 2017, Winter 2018, Fall 2019,
Winter 2020

- Awarded for having a term average of 80% or above

Certificate of Recognition

University of Toronto Institute for Multidisciplinary Design & Innovation

Oct 2017

- Awarded for project participation and success

President's Entrance Scholar

University of Toronto

Mar 2015

- Awarded for having an entrance average of 92% or above

SKILLS

- **Lab Work:** Mechanical Testing (Impact, Hardness, Fatigue), Optical Microscopes, Basic Cleanroom Fabrication, Breadboarding and Prototyping Circuits, General Lab Techniques and Safety
- **Modelling & Mechanical Design:** ANSYS Mechanical (FEA), AutoCAD, Inventor, SolidWorks, Engineering Drawings, PSpice
- **Programming:** C++, ROS, MATLAB (Simulink), R, MicroStrategy, Minitab
- **Product Development & Design:** Design for Six Sigma (Green Belt Certificate), Design FMEA, Design of Experiments, Robust Design, Latitude Development, Tolerance Stack-Up Analysis and Prototyping
- **Machining:** Lathe, Mill, Drill Press, Band Saw, Hand tools
- **Welding:** Oxy-Acetylene, Manual Arc & Gas Metal Arc Welding