GIBRAN RAJPUT

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EDUCATION

University of Toronto - Master of Engineering (MEng) – Mechanical Engineering 2024 – 2025

Recognition: CGPA – 3.90

Toronto Metropolitan University - Bachelor of Engineering (BEng) – Mechanical (Mechatronics) 2018 – 2023

Undergraduate Thesis: Designed and Fabricated a VTOL using an air-cooled engine for evacuation situations

Recognition: Dean's list 2019-2020, 2022-2023

PROFESSIONAL EXPERIENCE

Mechanical Design Engineer

Lincoln Electric Automation | Mississauga, ON | May 2023 – August 2024

- Designed (in SolidWorks) and helped in Assembly of an Automated Mechanical Gantry for SUB-ARC Welding that utilizes lead screw, ball bearing sliders, spur gearbox, worm gearbox and planetary gearboxes.
- Taught and mentored Junior Engineers and Interns on the process of design, sourcing components, and conducting engineering calculations.
- Used FEA on soft/weak joints and fixtures of the gantry to check the location of pre-fractural stress, also used FEA to validate designs that withstand vibration, improved design, which increased safety factor by 3 points
- Designed different parts with DFM in mind for different machinist (CNC, Lathe, Laser cutter, water jet, etc.)
- Created Engineering drawings with GD&T following both ISO and ANSI Regulations
- Designed many other custom solutions (Manipulators, automated cell station) and integrated these solution with heavy-duty NEMA AC/DC motors, mechanical parts (Lead Screws, Ball bearing sliders, bushings and gears). Managed and oversaw all phases of design, sourcing, and implementation from start to finish of each project

Engineering Intern

Lincoln Electric Automation | Mississauga, ON | Jul 2021 – Jul 2022

- Designed and helped in the Assembly of Lincoln Electric's first In-house Pantheon Pipe (Automated Manipulator)
- Integrated mechanical components, including motors, gear systems, ball screws, and electrical enclosures into automated gantry, manipulator designs, ensuring seamless coordination
- Diagnosed Software/Electrical Problems with FANUC Robots (robot arms) on both old and new FANUC Robots
- Supported testing and inspection of automated gantry systems, to validate performance, troubleshoot issues
- Led cross-functional team reviews to align design and manufacturing processes with the goals of the customer
- Collaborated across multidisciplinary teams to deliver compliant, manufacturable designs under tight deadlines
- Designed and fabricated many components made of various gauges and materials of sheet metal (adding holes, bending, and cutting)

Mechanical Designer

Toronto Metrobotics | Toronto, ON | Sep 2019 – May 2021

- Designed (in OnShape) a Gantry system for the Scara arm (End Effector) of a Mars Rover, reducing size by 20%
- Integrated sensor mounts and cable routing channels for a clean layout and to minimize electromagnetic interference.
- Programmed the Gantry and Scara arm in Python and created the motor compartment of the gantry
- Created detailed engineering drawings with GD&T for custom brackets, motor housings, and sensor enclosures.
- Collaborated with electrical/software teams to integrate motor drivers, IMUs, and vision systems into the rover
- Documented mechanical subsystem architecture and assembly procedures to support technician training

OTHER EXPERIENCE

Automated Bread Cutting Machine | Jan 2025 – Present

- Designed (in Fusion 360) a custom machine for a restaurant that loads, locks, cuts, and sorts bread slices.
- Acted as a systems integrator by sizing, sourcing, and validating BLDC motors, Stepper motors, rotary and hall-effect encoders, and mechanical components such as lead screws, couplers, and linear blocks and rails
- 3D printed prototype models of different mechanisms for easy iteration and implementation of changes
- Broke down the whole system into modules for ease of assembly (DFA) and future proofing for upgrades
- Designed parts of the machine so that it can be made with minimal waste material (DFM)

VTOL Lift Devices | Jan 2023 – Apr 2023

- Designed in SolidWorks, 3D printed, and built a drone that uses an air-cooled nitro-fuel engine
- Designed with DFM and DFA manufacturing principles for ease of rapid prototyping techniques (3D printing) and to optimize build efficiency and reduce material usage by 1kg (PLA Filament)
- Conducted performance testing across speed, load, and torque parameters to validate the powertrain design
- Utilized different combinations of spur and worm gearboxes from the market, and created custom gearboxes, to convert the rotary motion of the engine shaft to propeller motion

Inverted Pendulum | Sept 2022 – Dec 2022

- Designed (in SolidWorks) a Flywheel inverted pendulum and used FEA to check the structural integrity of the model at different stress points
- Designed and created a circuit diagram of the Flywheel model that included (IMU sensor, fuses, BLDC, and micro-controller)
- Simulated the Control system, using a mathematical model on MATLAB, to see any unforeseen errors/failures in the response of the model to a disturbance
- Created a Feedback loop program using PID controller parameters on Arduino (C++) to keep the pendulum up

Health Care Mobile Robot | Feb. 2025

- Programmed a mobile robot in ROS to utilize the data from the Kinect camera to avoid obstacles and reach certain destinations with the use of the SLAM algorithm
- Simulated the program on Gazebo and tested it in various environments

Multi-UAV Search and Rescue | Sep 2024 – Sep 2025

- Developed MATLAB (C++) Program for dynamic task allocation of multi-UAV urban SAR (Search and Rescue)
- Extended target motion models to simulate realistic urban behaviors and simulate targets hiding
- Developed path planning algorithms for multi-UAVs in Search and Rescue operations
- Conducted large-scale simulations showing 24% faster detection times

Single Motor Car | Nov. 2022 – Dec 2022

- Designed with DFA and DFM in mind, a single motor car that can go in all 4 directions on a flat plane
- Designed and used different adapter links for interchangeable parts for faster assembly and repair
- Programmed a custom Control Simulation on CoppeliaSim to foresee any potential mechanical or electrical failure based on the car's reaction

Cam Shaft Bearing Replacer | Feb 2023 – May 2023

- Designed an automated machine that replaces Camshaft bearings of car engines
- Designed the PLC program that controls the full cycle of the system with no human interference
- Used FEA and Control Simulation to test the integrity and efficiency of the Model in a real-life environment

Autonomous Drone Flight Plan | March 2025

- Created an A* algorithm for the drone to fly through multiple checkpoints. Programmed in Python and simulated in ROS via Gazebo

SKILLS

Computer-Aided Design:
OnShape, SolidWorks, Siemens NX, AutoCAD, SolidEdge, Fusion 360,Technical Drawing and Drafting, GD&T
Finite Element Analysis:
SolidWorks FEA
Programming:
MATLAB, C, C++, Python, Arduino, PLC, ROS 2
Libraries/Tools:
TensorFlow, Keras, Panda, OpenCV, Numpy, GitHub, PyTorch
Simulators:
CoppeliaSim, Simulink, Gazebo, LabVIEW
Design and Manufacturing:
Composites, 3D Printing, Test Planning, R&D Process, DFM/DFA, Machining, Sheet-metal Bending, Lathes, Laser cutting
Robotics/Actuation:
Knowledge and experience with BLDC and DC motors, AC Motors, rotary and hall-effect encoders, FANUC familiarity, manipulators, and torque-sensors
Soft Skills:
Team Player, Problem Solver, Adaptable, Excellent Communication Skills, Project Management Skills
Other:
Knowledge of industry standards and regulated environments (CSA, ISO, safety procedures)

Experienced in developing test plans, executing validation protocols, documenting design history files (DHF), and supporting regulatory compliance through structured reporting and traceability.

Familiar with BLDCs, encoders, planetary/harmonic gearbox selection; comfortable doing first-pass sizing with vendor tools

CERTIFICATIONS

Certified SolidWorks Associate (CSWA) in Mechanical Design | 2019
Granted by Dassault Systèmes

PICTURES

Automated SAW Gantry

Mars Rover

Mobile Health Care Robot

Inverted Pendulum

VTOL Nitrous Powered Drone

Automated Bread Cutting Machine