Parth Patel

Mechanical Engineer (Mechatronics Specialization)

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Education

Master of Engineering - Mechanical Engineering | December 2021 (Expected)
University of Waterloo | Waterloo, ON

Bachelor of Science - Mechanical Engineering | April 2020
Ontario Tech University | Oshawa, ON
- **3.9/4.3 CGPA**

Highlights

- On Dean's List (1) and President's List (5) for outstanding academic achievement
- Placed 1st at the National Design League-Ontario Tech Designathon in our challenge and top 4 overall
- Designed and built 12+ unique robots to compete in annual robotics competitions
- 5 years of designing, manufacturing, and assembling experience with sheet metal and box tubing
- Proficient in 3D CAD programs (NX or SolidWorks) to design components and assemblies
- Familiar with performing FEA analysis on components using NX and SolidWorks

Work Experience

Design Engineering Intern | May 2018 to August 2019
Ontario Power Generation - Nuclear | Pickering, ON
- Independently initiated and developed an Excel Macro using **VBA** which automatically found and informed the responsible engineer about their weekly meeting deliverables, **90% faster** than the older method
- Designed a custom mounting bracket and radiation shield using Onshape to mount a new pressure transmitter onto existing mounting holes in the field and without impacting surrounding equipment
- Reviewed proposals and documentation from vendors for engineering acceptance
- Performed field walk-downs and prepared detailed **engineering documentation** to approve changes in the plant without impacting operating conditions and other equipment
- Collaborated with a multi-disciplinary team to resolve and prevent reoccurrence of issues in the plant within 7 days

3D Printer Design Assistant | September 2017 to April 2018
Ontario Tech University | Oshawa, ON
- Saved Durham College **hundreds of dollars** in equipment cost by designing a 3D model of a PCA pump in **NX** which the College 3D prints to replace real PCA pumps in their labs
- Reviewed designs in **NX, Solidworks, and Cura** for common points of failure and presented solutions to customers which resulted in a **10% reduction** in failed print jobs
- Demonstrated strong **time management skills** by scheduling customer projects to minimize wait times and maximizing the use of the 3D printer
- Took the initiative to hold weekly tutorials to help students new to 3D printing which directly **increased the number of customer orders** we received
- Identified and repaired problems with the 3D printer to avoid delays for customers

Extracurricular

Mechanical Design and Prototype Mentor | July 2015 to Present

FIRST Robotics (FRC) | Scarborough, ON

- Used **Solidworks** to create part designs while focusing on **design for manufacturing**
- **Built functional prototypes** and **developed test methods** to validate concepts
- Manufactured parts using a **CNC machine** and assembled the robot within 6 weeks
- Demonstrated strong **verbal and written communication skills** by leading weekly progress meetings and writing weekly progress reports
- Mentored the team to **4 consecutive World Championships**

Projects and Competitions

Sustainably Powered Snow and Ice Melting System (Capstone) | Control System Lead

- Developed the control system for the project which included a solar panel and battery storage system, sensors for feedback, and a microcontroller to control the pumps, heater, and air compressor
- Implemented fail-safe methods to handle abnormal activities (ex. loss of signal)
- Performed electricity generated vs electricity required to determine the required battery storage size

Autonomous Maze Solving Robot | Team Lead

- Designed the robot structure with acceptable tolerance for easy manufacturing and assembly
- 3D printed different prototypes with multiple configurations to test and find the best design
- Packaged a microcontroller, motor shield, voltage regulator, power module, 4 IR sensors, an ultrasonic sensor, 2 encoders, 2 battery packs, 2 motors, a claw, and 2 servos within a 4” x 4” x 6.5” robot

Home Electricity Monitoring System | Team Lead

- Built a model home and developed the **Arduino code** to calculate the energy consumption and cost
- Implemented an ultrasonic and photosensors to automatically control the lights and save electricity

Biped Robot - Hackathon | Mechanical Lead

- Built a walking robot with off the shelf, laser-cut, and 3D printed parts in 36 hours with 3 team members
- **Reduced the build time, robot weight, and the number of parts** required by using a creative method that shifted the robot’s center of mass from side to side as it walked

Quadracycle Design – Third Year Class Competition | Team Lead

- Designed a Quadracycle using online part libraries and 50+ custom-designed parts in **NX**
- Performed **FEA simulations** to prove the design met the load requirements and required factory of safety

Skills

CAD:	- Solidworks (5+ years)	- NX Siemens (3+ years)	
Programming:	- Java (5+ years)	- C++ (3+ years)	- Matlab (3+ years)
Others:	- Arduino (2+ years)	- 3D Printing	- CNC Machining