

# NATHAN PEREIRA

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## SKILLS/CERTIFICATIONS/AWARDS

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Engineering Softwares: Ansys, AutoCad 2D, AutoCad 3D, Revit, Solidworks, MatLab, C++, PipeFlow, Arduino, PLC

## WORK EXPERIENCE

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### Solid Ultrabattery Inc

Guelph, Ontario

Battery Development Intern

September 2024 - December 2024

- Researching and testing graphite anodes for cells, utilizing **thermogravimetric analysis** and **X-ray fluorescence testing** to determine material composition.
- Designed and tested a peristaltic pump and ventilation system for optimizing the cathode coating process, achieving **50%** reduction in production time, utilizing **SolidWorks** for design and **Ansys** for **CFD analysis**.
- Developed 3D-printed single and multi-layer pouch cell molds, streamlining the manufacturing process and achieving a **25%** reduction in production time

### Tesla

Markham, Ontario

R&D Process Engineering Intern - Cell Engineering

January 2024 - April 2024

- Led the testing and validation of POP designs to improve **60 electrolyte filling machines** in Texas Gigafactory, utilizing in-depth procedures and root cause analysis to optimize designs.
- Spearheaded soak testing within a lab environment to evaluate the electrolyte compatibility of **18 material compositions** within cell manufacturing, applying a combination of qualitative and quantitative analysis.
- Conducted research and spearheaded the development of an RFID system slated for integration into upcoming next-generation electrolyte machines, representing an investment of over **\$2.3 million**. Responsibilities encompassed rigorous material testing, design work, and validation of proof of concept.
- Conducted thorough **fatigue and dispense calibration cycling tests** on electrolyte pumps to pinpoint root causes and provide valuable feedback to designers. Utilized a **VHX microscope** for detailed analysis of degradation over time, enhancing our understanding of long-term performance.
- Conducted tests to validate the design rationale behind RR cylinders, analyzing cell deformation and quantifying data, proving that **99%** of cells remained within specified limits.

### Toyota

Cambridge, Ontario

Analyst Engineering Intern

May 2023 - August 2023

- Utilized Toyotas' TBP problem analysis method to lead a cross-functional team in the complete redesign of the magnetic path for AGV navigation, optimizing route planning and eliminating potential disruptions, leading to improved overall operational reliability and a **62% decrease** in AGV errors.
- Engineered and implemented 3D-designed ergonomic hood jigs and fixtures, improving production efficiency and eliminating mechanical failures, resulting in **\$5,000** in cost savings.

### Cemcorp

Mississauga, Ontario

Mechanical Engineering Intern

September 2022 - December 2022

- Prepared comprehensive process flow charts, **P&ID diagrams**, BOM, tie-point list, and equipment lists to aid seamless communication with stakeholders throughout the design and implementation phases of an industrial alcohol distillery plant.
- Designed 3D piping models for **stress analysis** and developed a comprehensive drawing package for an alcohol distillery plant, ensuring **ISO 9001 compliance**, which led to a **Co-op Student of the Year nomination**.

### MCW Consultants

Toronto, Ontario

Mechanical Engineering Intern

January 2022 - April 2022

- Analyzed mechanical blueprints and markups, providing drafting of HVAC and Plumbing in **AutoCad** and **Revit** 3-D modelling for 10 different clients

## PROJECTS/DESIGN TEAMS

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### Battery Workforce Design Team - Solidworks, Ansys

Designed an **EV battery module** using Solidworks, conducting research on structural materials, performing load simulations and ensuring all mechanical and structural standards are met for the competition.

### Bridge Laying Robot Robot C, AutoCad, Solidworks

The project's goal was to utilize EV3 robots programmed with RobotC to place a bridge accurately between isolated points, adhering to a distance range of 20 to 30 centimeters.

## EDUCATION

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### University Of Waterloo

Waterloo, Ontario

Bachelor Of Applied Science, Mechanical Engineering

September 2021 - April 2026