

Samuel Petrina

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Summary

Driven mechanical engineering student graduating April 2025. Equipped with excellent hands-on and technical skills from work and FSAE (design team) experience. Has a demonstrated ability to work effectively both independently and as part of a multidisciplinary team. Skilled in using CAD software, conducting simulations, and writing code to optimize designs. Seeking a mechanical engineering design role in the automotive industry.

Education

Queen's University | Kingston, ON

Graduation date: April 2025

BS Mechanical Engineering – GPA: 4.1/4.3

Work Experience

Tesla Inc. | Palo Alto, California

May 2024 – August 2024

Mechanical Engineering Intern

- Designed and revised battery-enclosure stamped parts in CATIA V6 using surface modelling tools
- Ran weekly meetings for a multidisciplinary team with upwards of 10 engineers, coordinating part integration, manufacturing and vehicle assembly
- Validated designs using FEA simulations in Altair Simsolid, statistical tolerance stack-ups, stamping simulations, as well as crash and fatigue simulations
- Worked with 3rd party suppliers to procure test samples for battery enclosure structural tests as well as vehicle sealing tests

Zaber Technologies | Vancouver, Canada

September 2023 – April 2024

Mechanical Engineering Intern

- Conducted a series of experiments allowing for an improved understanding of component requirements resulting in a 30% decrease in failing products at final-line testing
- Revised a linear motor design allowing for the consolidation of motors between two product lines resulting in 12 fewer components in inventory and a 15% reduction of motor BOM cost
- Improved bearing preload method for micron-accurate positioning stages by designing custom equipment and revising technician procedures resulting in a 50% bearing preload time consumption and a 25% increase in product accuracy
- Revised drawings for a variety of products to ensure proper tolerance stack-ups are used as well as compliance with ASME Y14.5
- Used a coordinate measurement machine and other precision metrology equipment to ensure product accuracy throughout the implementation of component and process changes

Queen's University – Reactor Materials Test Laboratory | Kingston, Canada

May 2022 – August 2022

Undergraduate Research Assistant

- Designed a miniature tensile-testing stage weighing under 1 kg for use inside an X-ray diffraction machine
- Created an accurate and complete Solidworks CAD assembly of the tensile stage to ensure manufacturability and mass constraints were met
- Completed structural FEA simulations in ANSYS to ensure adequate load-frame stiffness allowing for accurate sample elongation measurements

- Proved feasibility of conductive heating system capable of temperatures up to 600° C using ANSYS thermoelectric simulations and electrical calculations completed in Python
- Wrote technical documentation for the tensile stage project to allow for project funding applications

Hydrogen Technology & Energy Corporation | Vancouver, BC

May 2023 – August 2023

Applications Engineering Intern

- Completed high-level preliminary calculations to assess green hydrogen production facility project feasibility
- Developed, maintained and updated project budget and expenditure spreadsheets

Extracurricular Experience

Queen’s Formula SAE Design Team | Kingston, ON *(see portfolio for more project details)*

Mechanical Team Lead

May 2024 - Present

- Leading the mechanical design of Queen’s University’s first electric FSAE car
- Coordinating with team leads to ensure proper integration between subsystems, adherence to deadlines, and rules compliance
- Working with machine shop staff and faculty to ensure work on the car is completed in a safe manner

Suspension Team Lead

September 2022 – Present

- Led the successful design and fabrication of the suspension, steering, and brake system for an open-wheel race car with a total budget of over \$60,000
- Designed a primarily waterjet bell-crank component that eliminates the need for time-consuming CNC mill setups while simultaneously reducing mass by 10%
- Designed new wheel spindles and steering knuckles optimized for machining allowing CNC setups to be reduced to 3 per component
- Developed a suspension load tool in MATLAB that calculates part loads using matrix math and required cross-sections based on column buckling strength
- Designed a novel steering column design based around a right-angle bevel gearbox eliminating packaging constraints imposed by using a double universal joint
- Ran meetings, allocated tasks, and managed training for the suspension team consisting of 8 members

Awards

- Received The Ontario Professional Engineers Foundation Scholarship valued at \$1,500 *July 2023*
- Received The McLean Family Award in Student Design valued at \$5,000 *June 2023*
- Dean’s Scholar - Awarded to students with a GPA above 3.5 *1st, 2nd & 3rd year*
- NSERC Undergraduate Summer Research Grant Recipient *April 2022*
- N.F. Dupuis Prize Scholarship - Awarded for exceptional standings in mathematics *August 2021*
- Received The Queen’s University Principal’s Entrance Scholarship valued at \$2,000 *September 2020*

Skills

- **Design:** CATIA V6, Solidworks, PDM, Dassault 3DEXperience, GD&T, Surface modeling
- **Analysis:** ANSYS, Altair Simsolid, Simulink, statistical tolerance stack-ups
- **Programming:** Python, Common data-science packages, MATLAB, Git, OOP concepts, Git
- **Electronics:** Arduino, soldering, implementation of digital and analog sensors
- **Manufacturing:** CNC and manual machining, steel fabrication techniques, MIG welding, carpentry tools
- **Other:** Enterprise resource planning tools