Samuel Petrina

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Education

Queen's University | Kingston, ON *Graduation date: April 2025*

- BS Mechanical Engineering – GPA: 4.08 / 4.30
- Awarded a total of $9,000 in scholarships for academic and design team excellence

Work and Design Team Experience

Tesla Inc. | Palo Alto, California *May 2024 – August 2024*

Mechanical Engineering Intern

- Designed and revised battery-enclosure stamped parts for next-generation vehicle in CATIA V6 using surface modelling tools
- Ran weekly meetings for a multidisciplinary team with upwards of 10 engineers, coordinating part integration, part manufacturing and vehicle assembly requirements
- Validated designs using FEA simulations in Altair Simsolid, statistical tolerance stack-ups, stamping formability simulations, fatigue simulations and vehicle crash simulations
- Worked with 3rd party suppliers to procure test samples for battery enclosure structural tests as well as vehicle sealing tests allowing for $500,000 in annual BOM cost savings

Zaber Technologies | Vancouver, Canada *September 2023 – April 2024*

Mechanical Engineering Intern

- Conducted testing 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 assembly method for micron-accurate positioning stages by designing custom equipment and revising technician procedures resulting in a 50% decrease in labour hours and a 25% increase in product accuracy
- Revised drawings for a variety of products to ensure correct tolerance stack-up calculations 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 Formula SAE Design Team | Kingston, Canada *September 2020 – Present*

Suspension Team Lead - (see portfolio for more project details)

- 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%
- Developed a new steering knuckle design optimized for machining allowing for only 3 CNC setups per part reducing machining time by 50%
- Created a suspension design tool in MATLAB that calculates part loads using matrix math and checks for potential buckling, tensile or weld failure
- Implemented a novel steering column design based around a right-angle bevel gearbox which eliminated packaging constraints imposed by using a double universal joint
- Designed a one-piece anti-roll bar which eliminated costly splines and significantly reduced part count

Skills

- **Design**: CATIA V6, Solidworks, PDM, Dassault 3DExperience, GD&T, Surface modeling
- **Analysis**: ANSYS, Altair Simsolid, Simulink, statistical tolerance stack-ups, limits and fits
- **Programming**: Python, Common data-science packages, MATLAB, Git, OOP concepts
- **Manufacturing**: CNC and manual machining, steel fabrication techniques, MIG welding, carpentry tools
- **Other:** Enterprise resource planning tools (ERP)