Joshua Block

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Education

Purdue University *(West Lafayette, IN)*   **May 2025**
Master of Science in Mechanical Engineering
Research Focus: Utilizing Finite Element Modeling of high strain rates in composite materials and analyzing the effects of heterogeneous properties on temperature hotspot formation in crystalline materials.

Queen's University *(Kingston, Canada)*   **Apr 2023**
Bachelor of Applied Science in Mechanical Engineering

Professional Experience

Hendrickson *(Woodridge, IL)*   **Design Engineering Intern**   **May 2024 – Aug 2024**
- Redesigned core components within a commercial truck rear suspension system to achieve improved ground clearance and product longevity for more demanding terrain.
- Developed a full system model in Siemens NX, optimizing weld and bolt placement to improve tooling accessibility during assembly line manufacturing.
- Worked with the elastomer research team to optimize a rubber bushing design based on primary vehicle load cases.

Pliteq *(Toronto, Canada)*   **Engineering Intern**   **May 2022 – Aug 2022**
- Led the final development phase for an AutoCAD plugin that generates project quotes based on building floorplans and validated the code using data from previous projects.
- Analyzed experimental acoustical data to confirm product compliance with the International Building Code.
- Developed a Python program that automates the process of uploading over 1000 acoustical test datasets to a web database.

Leadership and Involvement

Purdue Baja Racing Team   **Powertrain Team Member**   **Aug 2024 – Present**
- Developing a physics-based continuously variable transmission (CVT) model in MATLAB to simulate the dynamic response of the transmission system under different driving conditions.

Queen's Relectric Car Team   **Team President**   **Jan 2021 – May 2023**
(Formerly Powertrain & Battery Lead)
- Led a multidisciplinary team of six sub-team leaders, fostering open communication and collaboration to address inter-project constraints and ensure seamless integration of mechanical and electrical designs.
- Utilized SolidWorks and Ansys to perform finite element analysis (FEA), identifying potential failure points and estimating safety factors for a motor mounting system.
- Worked with high and low voltage (HV & LV) circuits to provide power to the motor and accessory systems, while using a battery management system (BMS) to protect against over-discharge and maintain balanced cells.

Queen's Supermileage Team   **Chassis Design Engineer**   **Sept 2022 – May 2023**
- Designed and built a carbon fiber chassis using wet layup processes and tube stock to minimize the vehicle's energy consumption for the Shell Eco-marathon competition.
- Conducted Failure Modes and Effects Analysis (FMEA) to identify and mitigate potential points of failure during competition.

Additional Employment

- FEA Simulations Research Assistant, Project Manager Teaching Assistant, Engineering Graphics Teaching Assistant, Health Research Assistant

Technical Skills

- SolidWorks, Siemens NX, Python, MATLAB, and Ansys Mechanical APDL