Joshua Block

www.josh-block.com | 765-337-3669 | josh@jmbprojects.com

Highlights

- Identified leading failure drivers for plasticity and fracture in composite materials under impact and thermal loading via finite element modeling.
- Calibrated ONERA M6 wing aerodynamics against NASA data, achieving 4.9% and 11.2% error for lift and drag, and evaluated stress and deformation using a one-way Ansys Fluent to Mechanical pipeline.
- Founded an EV design team at Queen's University, brought in 45 members and $40,000+ in sponsorships, and built an electric race go-kart.
- Redesigned a commercial truck suspension system to achieve 15% increase in ground clearance, a key performance factor for ensuring product longevity in overseas applications.
- Quantifying springback and mapping residual stress in sheet metal bending using Ansys Mechanical.

Education

Purdue University *(West Lafayette, IN)* **Aug 2025**
Master of Science in Mechanical Engineering (GPA: 3.73)

Queen's University *(Kingston, Canada)* **Apr 2023**
Bachelor of Applied Science in Mechanical Engineering (GPA: 3.77)

Professional Experience

Koslowski Group *(Purdue)* **Finite Element Research Assistant** **Aug 2023 – Aug 2025**

- Modeled high strain rate impact events using finite element analysis to capture plastic deformation, fracture, and thermal responses in composite materials.
- Investigated the effects of spatially varying microstructures on resulting temperature and fracture patterns.
- Evaluated microstructure resolution reduction strategies at both fixed and reduced mesh densities to identify efficient modeling approaches that balance accuracy and computational cost.

Hendrickson *(Woodridge, IL)* **Design Engineering Intern** **May 2024 – Aug 2024**

- Redesigned a commercial truck suspension system in Siemens NX, balancing structural strength, ride quality, and geometric packaging.
- Collaborated with the elastomer research team to optimize rubber bushing design, targeting improved durability and ride quality while addressing material-limit concerns under key load cases.
- Optimized weld and bolt placement to enhance tooling accessibility during assembly line manufacturing.

Pliteq *(Toronto, Canada)* **Engineering Intern** **May 2022 – Aug 2022**

- Led the final development phase for an AutoCAD plugin that generated project quotes based on building floorplans and validated the code using data from previous projects.
- Developed a Python automation program that uploaded over 1000 acoustical test datasets to a database.
- Analyzed experimental acoustical data to confirm product compliance with the International Building Code.

Leadership and Involvement

Queen's Relectric Car Team **Team President** **Jan 2021 – May 2023**
(Formerly Powertrain & Battery Lead)

- Led a multidisciplinary team of six sub-team leaders to develop an electric race go-kart, running weekly design review sessions to address inter-project constraints and ensure seamless integration of components.
- Designed and validated 6061-T6 motor mounts against drive-torque and impact load cases in Ansys, with no yielding, and supported CNC manufacturing and install.
- Developed a $LiFePO_4$ battery system (51.2 V, 3.07 kWh) with a BMS providing cell balancing and charge/discharge protection to power a 20 hp AC induction motor and low voltage electronics via DC-DC.

Queen's Supermileage Team **Chassis Design Engineer** **Sept 2022 – May 2023**

- Designed and built a lightweight carbon fiber chassis (74.6 lbs) using wet layup processes and tube stock to minimize energy consumption for the Shell Eco-marathon competition.
- Applied FMEA and FEA to assess critical failure modes and highlight peak stress regions at the roll bar and axle mounts.

Technical Skills

FEA/Simulation: Ansys Workbench, MOOSE, Simulink
CAD/Design: SolidWorks, Siemens NX
Programming: Python, MATLAB
Engineering Knowledge: Vehicle dynamics, HPC

Additional Employment

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