Joshua Block

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Highlights

- Designed for manufacturability across sheet metal, machined, cast, and 3D-printed components, spanning structural mechanical systems, enclosure assemblies, and prototype fixtures.
- Developing an IMU-based motion tracking system for athletes, with cloud integrated analysis algorithms to extract and display acceleration profiles on a Raspberry Pi dashboard controller.
- Managed mechanical and electrical bills of materials, coordinating component orders, raw materials, and labor budgeting to ensure accurate cost tracking and timely assembly.
- Founded and led a 45-member engineering design team, securing over $40,000 in sponsorships and coordinated the development of an electric race go-kart from concept to fabrication.

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 thermomechanical response of heterogeneous materials under thermal and mechanical loading to evaluate driving factors for plasticity and fracture behavior.
- Analyzed the influence of spatially varying microstructures on local temperature evolution and fracture initiation patterns.
- Implemented and validated mesh-resolution reduction methods developed during thesis work, quantifying computational efficiency gains while preserving predictive accuracy through parametric simulations.

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

- Redesigned a suspension system in Siemens NX to achieve 15% increase in ground clearance while balancing structural strength, serviceability, and packaging constraints.
- Collaborated with the elastomer research team to refine rubber bushing geometry and material selection for improved durability and ride quality.
- 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 floor plans and validated outputs using previous project data.
- Developed a Python automation tool to batch upload and catalog over 1000 acoustical test datasets into a database used by architects to support data-driven design decisions.
- Analyzed experimental acoustical data to verify product performance and confirm compliance with the International Building Code.

Leadership and Involvement

Queen's Relectric Car Team **Founder & Team President** **Jan 2021 – May 2023**

- Coordinated six sub-teams through weekly design reviews to resolve interface constraints, verify component fit, and maintain design documentation throughout the development of the electric go-kart.
- 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.
- Used FEA to verify structural integrity under vertical loading and roll-test conditions, highlighting peak stress regions at the roll bar and axle mounts.
- Performed FMEA and visual inspection to identify potential failure modes, including delamination at critical structural locations.

Technical Skills

FEA/Simulation: Ansys Workbench, MOOSE, Simulink
CAD/Design: SolidWorks, Siemens NX, AutoCAD
Programming: Python, MATLAB, editing C++
Engineering Knowledge: HPC, 3D printing

Additional Employment

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