

# Lucas Rodrigues

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## EDUCATION

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**BS Mechanical Engineering, Minor: Electrical and Computer Engineering** | GPA: 3.66/4.00

**Purdue University (West Lafayette)** | Expected Graduation: May 2027

**Involvement:** American Society of Mechanical Engineers (ASME), Delta Upsilon Fraternity, Intramural Soccer

**Relevant Coursework** Measurement and Control Systems, Machine Design, Mechanics of Materials, Thermodynamics, Electrical Engineering Fundamentals, Mechanical Design Innovation & Entrepreneurship

## WORK EXPERIENCE

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**Research Assistant | Composites Manufacturing & Simulation Center** January 2025 – May 2025

- Executed Double Cantilever Beam tests using a Universal Testing Machine and microscopy to evaluate fracture toughness in adhesively joined, 3D printed composite molds and assess impacts on tooling lifespan
- Designed and conducted ASTM-compliant vacuum bag leak tests on thermally cycled (up to 350°F) samples, revealing a 41% performance gap in vacuum integrity between print orientations, guiding future refinements
- Presented at Purdue's Spring Undergraduate Research Conference, scoring 21% higher than average across formal judging criteria and contributing to more cost-efficient aerospace and automotive manufacturing

**CNC Machinist & Process Engineer | 360 Creative Visual Solutions** May 2024 – August 2024

- Improved production efficiency and speed for 30+ large-scale commercial display projects by optimizing CNC operations, creating path presets, developing tool/material data logs, and procuring specialized router bits
- Reduced outsourcing and minimized material waste, achieving \$30,000+ in cost savings across all projects
- Resolved 8 critical hardware failures (sensor, motor, and power parts) to ensure continuous production

## PROJECTS

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**Fuel System | ASME Purdue Grand Prix Team** January 2024 – May 2025

- Led a 6-person engineering team, improving communication and resolving design inefficiencies to achieve a projected 10% reduction in tank weight, enhancing fuel efficiency and improving kart stability during races
- Designed a dual quick-lock and release system, reducing pit stop tank replacement time by an estimated 70%
- Modeled a high-fidelity Fusion 360 tank with baffles to minimize fuel slosh, boosting on-track performance.

**Electric Skateboard Design Competition | Autodesk & ASME Purdue** January 2024 – May 2024

- Managed a \$5,000 budget for tools, materials, and components to produce custom electric skateboards
- Engineered a flexible, weather-resistant battery and motor cover, integrating a layer-plated segmented design to accommodate deck flex while ensuring protection and sustained performance in varied conditions

**Exhaust System | ASME Purdue Grand Prix Team** August 2023 – December 2023

- Conducted in-depth research on variable exhaust systems, informing the team's material and design strategy
- Synthesized technical data from patents, design guides, and motorcycle exhaust systems, presenting key insights to guide team decisions, design trade-offs, and technical discussions during weekly meetings
- Simplified complex exhaust system concepts for non-experts, improving team understanding and leading to the creation of a structured project timeline aligned with testing phases and manufacturing deadlines

## EXTRACURRICULARS

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**Executive Board Assistant | ASME Purdue Executive Board** January 2025 – May 2025

- Collaborated with cross-functional teams to support ASME's 400+ member chapter, streamlining operations
- Created a dynamic Google Sheets automation tool that categorizes and visualizes financial transactions for all chapter subgroups, saving 50+ hours per semester and improving long-term budgeting strategy

## SKILLS

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**Software:** MATLAB, Simulink, LTspice, Python (Pandas, NumPy), C

**CAD/CAE:** NX, Fusion 360

**Technical:** GD&T, DFMA, CNC (Lathe/Mill/Router), Rapid Prototyping, Failure Analysis, ASTM Testing