Madison Schaaff

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EDUCATION

Cornell University, *College of Engineering* August 2022 - May 2026

B.S. Mechanical Engineering | M.Eng. Aerospace Engineering | Department GPA: 3.82 | Cumulative GPA: 3.50

Activities: Alpha CubeSat Research Team, Society of Women Engineers, First Gen Student Union, Cornell Ski & Snowboard Club

Relevant Coursework: Aeronautics, Propulsion of Aircraft & Rockets, Spaceflight Mechanics, Fluid Mechanics, Heat Transfer, Mechanical Synthesis, Mechanics of Materials, Mechatronics, Statics, System Dynamics, Thermodynamics, Automotive Engineering

PROFESSIONAL EXPERIENCE

Procter & Gamble St. Louis, MO

Manufacturing Engineering Intern May 2025 - August 2025

- Optimized robotic equipment performance by executing a loss elimination cycle, decreasing unplanned stoppages on this equipment to zero, and increasing production rate by 5%.
- Redesigned and expanded centerline tracking by 152%, introducing equipment-specific tracking and reducing unplanned downtime by 23% through enhanced operational visibility.
- Initiated quality factor (Q-factor) tracking, expanding from 0 to 46 primary and secondary Q-factor centerlines, strengthening statistical process control, and ensuring higher reliability of product quality.
- Developed software-based loss tree tool using MATLAB to categorize and quantify human, material, equipment, and method losses, saving operators 6 minutes per loss entry and standardizing root cause analysis across production lines.
- Reduced full line changeover time by 50% through work process optimization and communication with cross-functional teams.

NASA L'SPACE Mission Concept Academy Remote

Lead Thermal Engineer and Secondary Mechanical Engineer May 2024 - September 2024

- Designed a thermal control system for a lunar rover, ensuring temperature ranges to support sensitive instruments and payloads using heat transfer calculations and Siemens NX, receiving the NX CAD Design Associate Certification.
- Adjusted to a budget descope by designing a passive cooling system, saving over $10M in costs and 100W in power.
- Conducted trade studies on potential heating and cooling systems, balancing cost, weight, temperature, technology readiness levels, and heat dissipation requirements to meet mission objectives.
- Acquired comprehensive knowledge of NASA mission protocols, procedures, and best practices through hands-on experience and training under the guidance of NASA scientists and engineers, enhancing mission development skills.
- Collaborated with a 10-person cross-disciplinary team to deliver NASA-standard design reviews to lunar rover engineers.

Xylem, Inc. Baltimore, MD

Quality Assurance Engineering Intern May 2024 - August 2024

- Introduced 1D variation analysis approaches for pipe structural reliability under different assembly and load scenarios.
- Modeled pipe responses to internal pressure and external loads using Abaqus, validating results via hand calculations.
- Wrote technical assessment reports that provided cost-saving recommendations based on inspection and test results, preventing over $350K in pipeline damage for clients.

PROJECTS

Cornell Hyperloop Project Team Ithaca, NY

Braking Co-Lead January 2023 - Present

- Redesigned the frictional braking system by reducing mass, simplifying pneumatics, and automating pneumatic actuation.
- Developed an electromagnetic braking system from concept to assembly using modified transformers as electromagnets.
- Validated braking performance through coil testing, voltage/current measurements, and data analysis in MATLAB and Excel.
- Modeled and optimized component mounts in SolidWorks and Ansys, improving structural efficiency by 60%.
- Applied GD&T to braking system drawings, ensuring accurate fit and alignment of components during assembly.
- Fabricated components using machine shop training, producing custom pneumatic braking hardware, and mechanical drawings.

Symbiotic Engineering and Analysis Lab Ithaca, NY

Wave Energy Converter Engineer January 2024 - Present

- Conducted literature reviews of electrical machine technology to identify crossover applications for marine energy.
- Explored 3D variation analysis concepts for integration of marine generator components into converter assemblies.
- Created Python/MATLAB models to evaluate generator performance, presenting results at the 2024 IEEE Energy Conference.