Isaac Woodward

Security Clearance (DoD Secret) | 816-206-8312 | isaacbwoodward@gmail.com

Education

University of Missouri - Kansas City, Kansas City, MO
Master of Science in Mechanical Engineering — Expected May 2026
Bachelor of Science in Mechanical Engineering — May 2025 | GPA: 4.0/4.0

Experience

Graduate Research Assistant - Missouri Institute of Defense and Energy — Nov. 2024 – Present

- Designing, building, and testing a Stewart platform-based manipulator for ship-motion simulation
- Responsible for all parts of the project, integrating mechanical, electrical, and software systems
- Developed MATLAB app for kinematic analysis and workspace evaluation of Stewart platforms
- Implemented embedded systems using C++ and microcontroller platforms (Arduino and XIAO SAMD21), including CAN communication, DC motor controllers, and linear actuator controllers
- Developed system-level behavior and control laws using ROS2/Python on a Raspberry Pi 5
- Created assembly models of hardware in SOLIDWORKS to ensure successful system integration
- Performed extensive hands-on testing and debugging
- Installing OptiTrack motion capture system for high-quality position feedback and integrating position feedback into ROS2 environment
- Exploring various control architectures for redundantly actuated control, including complementary filtering, control allocation, and potentially model-predictive control

Human Landing Systems Intern - NASA Marshall Spaceflight Center — June 2024 – Aug. 2024

- Designed an elevator actuation drum using Siemens NX and Simcenter Nastran for use in an experiment investigating the effects of lunar regolith on actuation mechanisms
- Redesigned rotating detonation rocket engine nozzle extension manifold for additive manufacturing in PTC Creo and created production-ready technical drawings employing GD&T

Team Lead - NSIN Origami Drone Initiative (Senior Design) — Jan. 2025 – May 2025

- Led a team of students designing and testing a shape-changing drone prototype
- Coordinated a testing campaign of nine flight tests and one benchtop test, creating test plans and test results documentation for flight tests
- Reviewed flight logs/video and collaboratively investigated failure modes with team members
- Assisted team in mechanical design and avionic system design as well as flight controller setup

Undergraduate Researcher - University of Missouri – Kansas City — June 2023 – Aug. 2023

- Created finite element models of an adolescent knee to investigate the growth plate's effects on ACL stress/strain, discovering approximately 30-50% reduction in ACL stress/strain for knees with a growth plate
- Presented findings publicly multiple times, including at the Missouri State Capitol

Skills

Programming: C++, Python, MATLAB, ROS2
Robotics: Embedded Systems, Testing/Debugging, Control System Design
CAD: SOLIDWORKS, Siemens NX, PTC Creo, Basic GD&T, Assembly Modeling
Analysis: Siemens FEMap/Simcenter Nastran, ABAQUS, Structural Analysis
Electronics: Serial Communication Systems (especially CAN), Arduino and Similar Microcontrollers
Other: Public Speaking, Leadership, Academic Research and Writing