

# Jaden Xander Hernandez

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## Education

**Purdue University | West Lafayette, IN**

August 2022 - May 2026

Bachelor of Science in Aeronautical and Astronautical Engineering

**GPA:** 3.27 / 4.00

**Awards:** Northrop Grumman S.P.A.C.E. Award, Purdue University Presidential Scholarship

**Relevant Coursework:** Rocket Propulsion, Aerodynamics, Control Systems Analysis, Thermal Sciences, Dynamics and Vibrations, Fluid Mechanics, Signal Analysis, Structural Analysis, Thermodynamics

## Experience

**Undergraduate Research Assistant | West Lafayette, IN**

February 2025 - Present

Nak-seung Hyun Research Program

- Conducting unsteady vortex lattice method analysis using Ptera Software to evaluate aerodynamic behavior for various ranges of wing articulation on a biomimetic ornithopter robot under the advising of Dr. Nak-seung Hyun.
- Performing FEA in SolidWorks to predict failure points on linkages influencing wing flapping behavior.
- Manufacturing shaft and linkage connectors via stereolithography.
- Programming MATLAB scripts using fast Fourier transform to filter force transducer data from wing flapping tests.

**Undergraduate Teaching Assistant | West Lafayette, IN**

January 2025 - May 2025

Purdue University College of Liberal Arts

- Creating lesson plans for "Writing Proposals and Grants" to teach 35 students the principles of grant writing.

**Undergraduate Teaching Assistant | West Lafayette, IN**

August 2024 - December 2024

Purdue University School of Engineering Education

- Taught 100+ first-year students fundamental engineering skills such as data analysis via descriptive statistics in Excel and the engineering design process as part of the course "Transforming Ideas to Innovation I".

**Undergraduate Researcher | West Lafayette, IN**

September 2023 - November 2023

Purdue University INSPIRE Institute

- Coauthored the annual "Engineering Gift Guide" with informative reviews detailing key product features and learning outcomes from six educational toys aimed at developing STEM skills in children.

## Projects and Involvement

**Thermal Sciences: "Workflow to Estimate Heat Transfer for High Altitude Flight"**

March 2025 - May 2025

- Programmed a user interface in MATLAB to estimate heating characteristics from forced convection and conduction for high altitude sounding rockets within 10% error of Ansys simulations while reducing simulation time by over 90%.
- Formulated a workflow to approximate insulation thickness based on desired internal temperature and intended insulation material, allowing users to make design considerations for insulation earlier in a rocket's design process.

**Five Dynamics**

October 2024 - Present

- Co-founded the club, overseeing collaboration between 25+ members within four rocketry-focused divisions.
- Designing an unmanned aerial vehicle intended to test avionic systems for future rocket projects by using XFLR5 to determine optimal wing design, MATLAB to calculate takeoff parameters, and Autodesk Inventor to model fuselage and wing components with attention to aerodynamic performance and structural integrity via FEA.
- Utilizing Ansys Fluent to analyze flow behavior for rocket airframe designs to validate fin geometry and location.
- Developed parametric fin airfoil profiles in SolidWorks, streamlining future design iterations.

**Association for Computing Machinery's Special Interest Group for Robotics**

August 2022 - May 2024

- Coordinated documentation and time management via Gantt charts among subteams to assure timely robot development as Strategy Subteam Lead while managing accounting and finances as Treasurer.
- Designed components in Autodesk Inventor and additively manufactured them with consideration for durability, manufacturability, and fabrication time to be easily implemented and sustainably used in head-to-head competition.

**Introduction to Aerospace Design: "Mars Sample Retrieval Mission Design"**

August 2023 - December 2023

- Developed MATLAB models applying the patched conics approximation to determine mission parameters, including delta-V, vehicle stage masses, and orbital periods for a hypothetical Mars sample retrieval mission.
- Researched and selected launch vehicles, propellants, and risk mitigation strategies meeting mission criteria.
- Authored and presented a 72-page design report detailing mission parameters and design specifications, leading to the group's recognition for the Northrop Grumman S.P.A.C.E. Award for excellence in design communication.

## Skills

**Design & Analysis:** Siemens NX, Autodesk Inventor, SolidWorks, Ansys Fluent

**Simulation & Control:** MATLAB, Simulink, Python, XFLR5, Ptera Software, C

**Manufacturing:** Fused Deposition Modeling, Stereolithography, Laser Cutting

**Product Data Management:** Aras Innovator