Jaden Xander Hernandez

U.S. Citizen | (925) 200-3824 | hernandezjaden4@gmail.com | jadenhernandez.com

Education

Purdue University | West Lafayette, IN — Expected 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, Spacecraft Electric Propulsion, Nuclear Thermal-Hydraulics, Aerodynamics, Control Systems Analysis, Thermal Sciences, Dynamics and Vibrations, Fluid Mechanics, Structural Analysis

Experience

Undergraduate Research Assistant (Design Engineer) | West Lafayette, IN — February 2025 – Present
Nak-seung Hyun Research Program
- Evaluated aerodynamic performance of varying ranges of wing motion and flapping frequencies for a biomimetic ornithopter robot by conducting unsteady vortex lattice method analysis with Ptera Software.
- Improved coefficient of lift by 50% over traditional NACA airfoils by designing biomimetic airfoil profiles in MATLAB.
- Estimating airfoil and wing performance for gliding with XFOIL and XFLR5 before designing wing spars in SolidWorks.
- Developing parametric elliptical wing sketches in SolidWorks to accelerate prototyping and laser cutting fabrication.
- Manufacturing 6-10 mm shaft and linkage connectors via stereolithography with less than a 3% defect rate.
- Programming FFT MATLAB scripts to filter hundreds of force transducer data sets and evaluate lift and moment trends.

Undergraduate Teaching Assistant | West Lafayette, IN — January 2025 – May 2025
Purdue University College of Liberal Arts
- Created 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 (data analysis in Excel and engineering design process).

Undergraduate Researcher (Reviewer) | 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

Five Dynamics: Ultra-Lightweight Rocket Design — August 2025 – Present
- Leading the design of a 10,000 ft apogee, ultra-lightweight rocket (<200 g) powered by a G-class solid rocket motor.
- Optimized motor selection by estimating propellant/inert mass in MATLAB, meeting specific impulse requirements.
- Leveraging OpenRocket to optimize airframe features and overall stability to increase predicted apogee by 200%.
- Modeling preliminary airframe geometries in SolidWorks and utilizing FEA to ensure a safety factor of over 1.25.

Workflow to Estimate Heat Transfer for High Altitude Flight — March 2025 – May 2025
- Developed a MATLAB-based UI to estimate convective heating on high-altitude sounding rockets, achieving results within 10% of Ansys simulations while reducing simulation time by 90% compared to typical finite element methods.
- Streamlined the workflow for approximating 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.

Purdue SIGBots: VEX Robotics Competition Robot Design — August 2022 – May 2024
- Oversaw design of an award-winning, holonomic 15" robot in 2024, achieving a record of 6 wins and 4 losses.
- Coordinated documentation and time management via Gantt charts to assure timely robot development.
- 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.

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

CAD & Analysis: Siemens NX, Autodesk Inventor, SolidWorks, Autodesk Fusion 360, Ansys Fluent (CFD)
Programming & Simulation: MATLAB, Simulink, Python, C, OpenRocket, XFLR5, XFOIL, Ptera Software
Project Tools: Aras Innovator, Jira, Gantt Charts
Fabrication: Fused Deposition Modeling, Stereolithography, Laser Cutting
Data Acquisition: Subsonic/Supersonic Wind Tunnels, Dual Column Tensile Tester, Force Transducers