Alex Zhou

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EDUCATION

MSAAE, Aeronautical & Astronautical Engineering | Purdue University *January 2024 - May 2026*
- Focus in Propulsion and Minor in Aerodynamics
- Relevant Coursework: Computational Combustion & Propulsion, Combustion, Computational Aerodynamics

BSAAE, Aeronautical & Astronautical Engineering | Purdue University *August 2020 - December 2023*
- Specialization in Propulsion
- Dean's List and Semester's Honors List

PROFESSIONAL EXPERIENCES

Propulsion and Energy Lab | Maurice J. Zucrow Labs, West Lafayette, IN *August 2024 - Present*
Graduate Researcher
- Co-lead experiments to investigate battery thermal runaway behavior for lithium-ion cells
- Streamlined experimental configurations to ensure safety and improve overall efficiency
- Assessed capabilities of CFD software to simulate battery cell behavior and properties
- Utilized LAMMPS to investigate battery electrolyte solution transport properties and computational accuracy

Computational Energy and Propulsion Lab | West Lafayette, IN *January 2024 - May 2024*
Graduate Researcher
- Investigated Large Eddy Simulation (LES) combustion modeling accuracy of buoyant flames based on experimental data
- Optimized meshes in OpenFOAM to enhance computational accuracy and efficiency while reducing numerical errors
- Developed and evaluated numerical techniques for improving computational models
- Evaluated academic literatures to establish comprehensive theoretical foundation and research methodology

Purdue Energetics Research Center | West Lafayette, IN *May 2023 - December 2023*
Undergraduate Researcher
- Performed particle analysis to develop a predictive modeling of additively manufactured energetic materials
- Constructed theoretical framework to generate 3D tessellations for Discrete Element Method (DEM) simulations
- Utilized meso-scale modeling to analyze microstructure of complex crystal-binder formations

Composites Manufacturing And Simulation Center | West Lafayette, IN *June 2022 - May 2023*
Undergraduate Research Assistant
- Applied RTM and VARTM process to fabricate prepreg and resin coupons bar models for physical prototyping
- Explored effects of bridging, ply wrinkling, and voids on dimensional accuracy and structural integrity
- Standardized schematics of molds and experimental procedures to improve safety, efficiency, and communication

TECHNICAL PROJECTS

Purdue Undergraduate Rocket Propulsion Lab - Turbojet *January 2025 - Present*
- Developing Purdue's only air breathing propulsion project, eventually sized to be used as a medium sized UAV power plant and SAF compatible

Purdue Space Program: A SEDS Chapter - Liquids *September 2023 - December 2024*
- Worked with 100+ students to develop and design an ethanol-LOX pressure-fed rocket for FAR-DPF Launch Contest
- Assisted in the assembly of Wrapping Hand-Assisted Machine to apply carbon fiber overwrap onto ablative material
- Collaboratively developed 6 degrees-of-freedom (DoF) model in MATLAB and Simulink to predict rocket performance
- Assessed heat source contributions to fin can and nose cone for thermal analysis during pre-launch and in-flight phases

LEADERSHIP EXPERIENCE

Graduate Teaching Assistant | West Lafayette, IN *August 2024 - Present*
- Assisted in AAE 339 - Aerospace Propulsion, AAE 590SA - Sustainable Aviation, AAE 590AP - Aerospace Propulsion
- Supported instructors in delivering course material, proctoring, and grading
- Held office hours to assist students with questions regarding course materials, homeworks, and tests

Purdue Cornerstone Christian Fellowship | West Lafayette, IN *August 2022 - Present*
- Coordinated with a small team in planning events for over 50 students, including scavenger hunts and potlucks
- Collaborated in planning multiple charity events to raise funds to support club activities

SKILLS & AWARDS

Software: LAMMPS, ANSYS Fluent, Solidworks, Siemens NX, OpenFOAM, ParaView, HPC, Microsoft Office
Programming Languages: MATLAB, Simulink, Python, C++
Awards: 2020 Elks Most Valuable Student Contest Scholarship, 3rd Best Poster Presentation Award at AAMP-UP Symposium