Zachary Selzman

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Work Experience

SULI Intern June 2025 — August 2025
National Laboratory of the Rockies, US Department of Energy *Boulder Colorado*
- Analyzed the impact of obstacle-induced turbulence on small wind turbine power production using field-collected wind data
- Quantified deviations from current international measurement standards (IEC) and evaluated implications for standard revision
- Supported research informing updates to international turbine performance testing standards
- Delivered findings through a technical poster and a formal research paper for the U.S. DOE SULI program

Aerodynamics Team Member September 2024 — Present
Cal Poly Wind Power *San Luis Obispo, CA*
- Designed and optimized turbine components (blades, nosecone, nacelle) for the DOE Collegiate Wind Competition (CWC)
- Modeled and optimized airfoil performance using QBlade and Python across varying wind speeds and tip-speed ratios
- Planned and executed wind tunnel test campaigns, including instrumentation, data acquisition, and validation against analytical models
- Conducted structural and aerodynamic validation testing to inform iterative design improvements

Instructional Student Leader September 2024 — June 2025
California Polytechnic State University *San Luis Obispo, CA*
- Led weekly tutoring sessions and workshops for 10+undergraduate students in physics, statics, dynamics, and multivariable calculus
- Supported students with exam preparation, assignments, and project work across multiple core engineering courses
- Adopted teaching strategies to accommodate varying student skill levels and learning styles

Education

California Polytechnic State University San Luis Obispo, CA
Bachelor's of Science, Aerospace Engineering *Sep 2023 — Expecting June 2027*
- Dean's List Recipient, member of the AIAA, Wind Power, and Alpine Clubs

Relevant Coursework: Dynamics and Controls, Aerospace Structures, Design and Manufacturing, Fluid Dynamics

Projects

Air Motor
California Polytechnic State University *San Luis Obispo, CA*
- Modeled and assembled a functioning air motor
- Designed, machined, and tested components using CNC milling and manual lathe operations
- Integrated manufactured and cast components into a functional assembly and evaluated performance under load

Screwdriver
California Polytechnic State University *San Luis Obispo, CA*
- Designed and machined a screw driver with a modular tip for both flathead and phillips head bits

Aerodynamic Code Adventure
California Polytechnic State University *San Luis Obispo, CA*
- Simulated unsteady viscous flow using `Waterlily.jl` to analyze Strouhal number variation across Reynolds numbers
- Implemented boundary conditions and flow visualization techniques to characterize vortex shedding behavior

Technical Skills

Matlab, Python, Julia, Qblade, simFlow, Solidworks, Autodesk Fusion, AutoCAD, Ansys Fluent, Granta EDUpack Arduino, GD&T, Field Test Engineering, Data Analytics