Daniel Lewis

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Professional Summary

Mechanical engineer specializing in aerial systems design, high-speed dynamics, and electromechanical integration. Experienced in end-to-end product development from concept to operational systems for high-velocity aerospace applications, including drone subsystems, fluid-structure interactions, and advanced aeroelastic analysis. Proficient in SolidWorks, MATLAB, FEA, and GDT, with extensive hands-on prototyping experience using CNC machining, 3D printing, and rapid iteration techniques. Proven leadership in Formula SAE and AIAA Rocketry, driving complex systems from design to deployment. U.S. Citizen, eligible for Top Secret Security Clearance.

Experience

Lockheed Martin — May 2024 – January 2025
Electronic Materials and Processing Intern — *Littleton, CO*

— Spearheaded material performance tracking for 12 critical aerospace materials using Lockheed Martin's PMPDB database, optimizing lifecycle assessments and ensuring compatibility with space-grade applications.

— Developed test plans to improve circuit card cleaning (CCAs) using Vertrel & IPA, enhancing efficiency while preserving adhesive integrity.

— Streamlined inter-branch procurement analysis by identifying and aligning over 200,000 parts across Lockheed's Space, Aeronautics, MFC, and RMS, driving standardization and bulk purchasing initiatives.

— Led cross-departmental initiatives to enhance ESD-safe container designs, interfacing with vendors to integrate locking mechanisms and ergonomic improvements, enhancing technician safety and ease-of-use.

— Worked alongside technicians on conformal coating & automated soldering, applying ESD safety protocols in cleanroom environments.

Aeroelastic Wing Optimization Research — January 2025 – Present
Undergraduate Researcher — *Merced, CA*

— Conducted structural and aeroelastic analysis of wing designs to minimize flutter and improve aerodynamic efficiency using MATLAB and HyperWorks.

— Developed MATLAB-based analytical tools to evaluate wing performance under varying wind speeds, enabling digital twin-like predictive capabilities.

— Collaborated on finite element simulations (FEA) for structural deflection and load analysis to ensure durability and reliability in high-velocity conditions.

Non-Equilibrium Fluid Dynamics and Plasma Lab — April 2023 – December 2024
Undergraduate Lab Technician — *Merced, CA*

— Designed, machined, and integrated custom high-voltage copper electrodes for 50,000V plasma reactors, optimizing plasma stability and treatment efficiency.

— Performed CFD simulations using OpenFOAM to model ionized gas behavior for water treatment and nitrogen infusion experiments.

— Optimized signal generators for plasma experiments, improving measurement accuracy in high-voltage testing.

— Troubleshot plasma reactor operations, resolving electrical & mechanical inconsistencies to improve experiment stability.

— Collaborated closely with graduate researchers to refine plasma testing protocols, applying electromagnetism principles to enhance reactor performance and material processing applications.

Electrified Adventures — May 2023 – August 2023
Technician Intern — *Orange, CA*

— Diagnosed electromechanical failures in motors, battery packs, and controllers using multimeters & oscilloscopes.

— Resolved mechanical issues (misalignments, worn parts) and electrical faults (voltage irregularities, signal issues) to improve system reliability.

— Performed motor performance analysis on brushless DC motors (BLDCs), ensuring proper functionality and peak efficiency.

— Optimized controller tuning and fault detection by monitoring duty cycles, current draw, and signal integrity with oscilloscopes, enhancing motor responsiveness and reducing energy losses.

— Applied signal tracing and continuity testing techniques to debug wiring harness failures, implementing enhanced connection strategies that led to the repair of 75+ electric vehicles.

– Enhanced wiring and repair workflows using advanced soldering techniques, ensuring robust electrical connections and improving long-term system reliability.

UC Merced STEM Tutoring Center **August 2022 – Present**

Physics Tutor *Merced, CA*

– Tutored over 100 students in Classical Physics and Electromagnetism, adapting explanations to diverse learning styles, which led to a 20% average improvement in exam scores.
– Explained complex physics concepts using real-world analogies, improving student comprehension.
– Collaborated with faculty to design physics workshops, identifying common pain points in mechanics and electromagnetism and delivering engaging, hands-on learning experiences.
– Trained and mentored new tutors enhancing overall center efficiency and student engagement.
– Applied physics to engineering problems, helping students connect coursework to real-world applications in thermodynamics, circuit analysis, and material science.

Projects

Guayule Rubber Mechanical Testing **December 2024 – Present**

Research Project — NSF Engineering Research Center *Merced, CA*

– Developed and executed a testing protocol to characterize the mechanical properties of guayule rubber, aiming to compare its performance with conventional natural rubber.
– Researched and adhered to ASTM standards for elastomer testing; fabricated custom specimens for compression (29mm × 6mm pucks) and tensile (2mm thick, 60mm dogbones with 25mm gauge length) tests.
– Designed and implemented a novel slicing method using an industrial meat slicer to convert irregular rubber blocks into precise, uniform test samples—earning commendation from machine shop and lab staff for ingenuity.
– Conducted tensile and compression tests using calibrated equipment; generated stress-strain data to extract material properties including modulus of elasticity, yield strength, and ultimate tensile strength.
– Analyzed experimental results using MATLAB and Excel, preparing technical visualizations and statistical comparisons for client Dr. McCloskey.
– Presented findings to faculty reviewers, contributing critical data to finalize the rubber extruder development project.

Lab-Scale Extruder for Rubber Synthesis **August 2024 – Present**

Capstone Project — NSF Engineering Research Center *Merced, CA*

– Designed and fabricated a lab-scale extruder in SolidWorks to process unvulcanized rubber, targeting enhanced mechanical properties through optimized shearing and kneading mechanisms.
– Conducted FEA simulations in SolidWorks to refine component designs, ensuring structural integrity and thermal efficiency, with preliminary results confirming design feasibility.
– Applied GD&T to optimize system conveyance by ensuring precise clearances in the extruder barrel.
– Performed heating and mixing calculations using MATLAB to ensure uniform material distribution, collaborating with a multidisciplinary team to prepare for machining and assembly.
– Created thermal analysis models to safeguard extruder performance under diverse load conditions, optimizing heat distribution for increased efficiency.
– Presented design outcomes to faculty and industry partners, earning recognition for innovative application of additive manufacturing in prototyping.

AIAA Rocketry — UC Merced **August 2023 – Present**

High-Powered Rocket Design *Merced, CA*

– Designed and validated structural components for a high-powered rocket, optimizing for high-stress aerospace environments.
– Performed FEA and material tests to simulate launch dynamics, achieving a 12% weight reduction without compromising structural integrity.
– Oversaw subsystem integration for payload compartments, ensuring modular designs and seamless assembly for launch operations.
– Collaborated with team members to evaluate propulsion systems and verify recovery mechanisms, contributing to multiple successful launch trials.

Formula SAE — UC Merced **November 2022 – Present**

Electric Vehicle Design *Merced, CA*

– Directed the design and testing of a lightweight EV chassis, cutting frame weight by 18% through iterative FEA and CAD refinement.
– Engineered and integrated battery enclosures with cooling systems, ensuring thermal stability and boosting race performance.

- Conducted subsystem testing and durability analysis, addressing failure points to enhance overall vehicle reliability.
- Collaborated within a 10-person team to implement dynamic testing protocols, driving a 25% increase in track performance and acceleration.

Boeing 747 Structural Simulation November 2024 – December 2024

Aerospace Structures, Academic Project *Merced, CA*

- Modeled a detailed structural segment of the Boeing 747 using SolidWorks and validated stress distribution through Hypermesh FEA and hand calculations.
- Developed a comprehensive failure analysis report, ensuring accuracy of software simulations against theoretical results.

Education

University of California, Merced August 2021 – May 2025

Bachelor of Science in Mechanical Engineering *GPA: 3.7 / 4.0*

Fairmont Preparatory Academy August 2017 – June 2021

Highschool Diploma *GPA: 3.7 / 4.0*

Skills

Software: SolidWorks, MATLAB, NX, Python, OpenFOAM, HyperWorks, AutoCAD, Microsoft Office

Simulation & Analysis: Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), Structural Dynamics, Thermal Stress Analysis, Electromagnetism, Aeroelasticity

Manufacturing & Fabrication: CNC Machining, 3D Printing, Welding, Soldering, Composite Fabrication, Rapid Prototyping, GD&T

Testing & Instrumentation: Multimeters, Oscilloscopes, Signal Generators, DAQ Systems, Vibration Tables, High-Voltage Plasma Testing, Material Testing

Engineering Applications: Electromechanical Systems, High-Voltage Systems, Motor Controllers, Battery Management Systems (BMS), Control Systems, Aerospace Subsystems

Industry Standards: ASME Y14.5 (GD&T); and IPC J-STD-001, MIL-STD-810 for Space-Grade application

Soft Skills: Communication, Leadership, Technical Writing, Critical Thinking, Team Collaboration, Adaptability, Problem-Solving

Languages: English (Native), Spanish (Native), Russian (Intermediate)