

Allan Chen

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EDUCATION

University of California, Los Angeles

Expected Graduation June 2026

B.S., Aerospace Engineering

- **Relevant Coursework:** Fluid Mechanics, Rigid Body Dynamics, Statics & Mechanics of Materials, Electricity & Magnetism

SKILLS

- Rocket propulsion system design, manufacturing, testing, and analysis
- 3 Axis CNC Machining, Mill, Lathe, 3D Printing, Laser Cutting, Composite Layups
- SOLIDWORKS, Fusion 360, MATLAB, ANSYS FEA, HSMWorks CAM, C++, Python, JavaScript

EXPERIENCE

Lead Engineer - Liquid Propulsion Feed System | Rocket Project at UCLA

July 2023 – Present

- Spearheaded design of Ethanol - LOx liquid rocket feed system **integrating propellant flow throttling capabilities**.
- Developed custom throttling valve actuation mechanism with **70% flow throttling range**. Performing within **7% of target outputs in high pressure and cryogenic applications**.
- Oversaw the complete lifecycle of pressure vessel development through design, manufacturing, and proof-testing; Ensuring compliance with industry standards, **adhering to ASME BPVC and AIAA S-080 standards**.
- Constructed MATLAB models to conduct thorough **thermal and fluids analyses** for system optimization. Streamlined component level testing with an analytical approach, **reducing required iterative testing envelope by 90%**.

Lead Engineer - Hybrid Propulsion Feed System | Rocket Project at UCLA

Dec 2022 – June 2023

- Guided a cross-functional team of 5+ student engineers in **comprehensive development of a hybrid propulsion feed system**, integrating Nitrous Oxide liquid oxidizer and solid ABS thermoplastic fuel.
- Consistently achieved target flow rates and pressures **within 5% of calculated targets** in static tests.
- Applied **hand calculations and FEA methodologies** to assess system structural requirements. Implemented mass optimization strategies, ensuring a balanced and efficient design meeting both performance and safety standards.
- Carried out **pad operations on multiple static tests**, identifying and addressing system-wide issues, and amending procedures to ensure nominal system performance in future operations.

PROJECTS

Thrust Vectoring Liquid Rocket

Jan 2023 – Present

- Researched and designed a 100 lbf long burn Ethanol - Nitrous Oxide rocket propulsion system for use as a control system testbed, with **engine gimbal and variable propellant flow control capabilities**.
- Conducted in-depth trade studies, referencing proven technologies and experimental literature to inform a low-cost and efficient system design. Oriented for manufacturability within constraints of an **initial \$2500 materials budget**.
- Applied rigorous hand calculations, incorporating **fundamental rocket equations, isentropic relations, and incompressible fluid mechanics** in design of propulsion system around target specifications.
- Constructed a **regeneratively cooled rocket engine MATLAB thermal model**, providing a sophisticated simulation of **mechanical and thermal stresses, and approximating effects of chamber film cooling** fed by engine coolant.
- Programmed a comprehensive liquid **fluid system simulation** in **Python with Jupyter Notebook** enabling rapid design iteration through various plumbing geometries and components, **streamlining calculations and system optimization**.

6 Degree of Freedom Pick-and-Place Robot

April 2023 – Jan 2024

- Developed a conceptual design for a 6 revolute joint manipulator with 3 linkages in **SOLIDWORKS CAD**, featuring an **articulated work envelope** and 270 degrees of rotation on each joint, creating a comprehensive blueprint for potential future hardware implementation.
- Programmed control software incorporating **forward and inverse kinematics**, utilizing quaternions for precise 360-degree movements, with **modularity enabling potential hardware integration across a range of platforms**.
- Utilized **low cost iterative development methodologies on subscale prototypes** to assess control software performance and manipulator dexterity.