LUIS E. CENA

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SUMMARY

Aerospace Engineer (B.S., UC San Diego — Aerothermodynamics) with hands-on experience in CFD simulation, propulsion system analysis, experimental aerodynamics, and mechatronic system design. Proven ability to apply theory to practical hardware, from wind tunnel testing and data acquisition to autonomous rotary-wing vehicle design. Bilingual (English/Spanish). Seeking an entry-level or apprentice-level position to contribute to aircraft maintenance, propulsion, structural, or test engineering teams.

EDUCATION

University of California, San Diego *Graduated April 2024*
Bachelor of Science in Aerospace Engineering — Aerothermodynamics Specialization

- Relevant Coursework: Computational Fluid Dynamics, Heat Transfer, Propulsion Systems, Aerodynamics, Experimental Techniques, Aerospace Materials, Structural Mechanics, Thermodynamics, Fluid Mechanics, Control Systems, Space Mission Analysis

TECHNICAL PROJECTS

Vortex-Cooled Rocket Engine CFD Simulation *UC San Diego*
Ansys Fluent | Propulsion / Thermal Analysis

- Modeled an innovative vortex cooling concept in which cryogenic propellants are injected tangentially to generate a rotating flow, creating a protective thermal film along the nozzle wall and isolating the combustion chamber liner from extreme combustion temperatures.
- Validated vortex stability, confirmed chamber pressure distributions, and verified thermal insulation effectiveness — demonstrating the design's feasibility as a cooling strategy for high-performance liquid rocket engines.

Wind Tunnel Aerodynamic Testing *UC San Diego*
Experimental Aerodynamics | Data Acquisition & Analysis

- Conducted lift and drag measurements on a wing section across multiple angles of attack using a subsonic wind tunnel. Operated force balance instrumentation, extracted raw sensor data, and post-processed results to derive CL and CD curves.
- Compared experimental coefficients against theoretical predictions, identifying sources of measurement uncertainty and validating aerodynamic models.

Autorotation Planetary Lander Design *UC San Diego*
Rotary-Wing Vehicle Design | Systems Integration | Arduino / C++

- Designed and built a rotary-wing lander concept capable of controlled descent on planetary bodies with thin atmospheres. The vehicle maintains a stable rotation rate and constant descent velocity through passive blade pitch geometry — no active power source required for the rotor.
- Integrated an onboard camera module for descent imagery capture; programmed flight control and sensor logic using Arduino (C++) within strict mass and volume constraints.
- Led systems integration and delivered technical presentations to faculty, demonstrating multidisciplinary design trade-offs and mission-level analysis.

Aerodynamic Loads Calculator *UC San Diego*
MATLAB | Computational Tool Development

- Developed a MATLAB tool to compute aerodynamic loads and key performance metrics for arbitrary airfoil geometries, supporting structural sizing decisions in early-stage design.

TECHNICAL SKILLS

Simulation & CAD: Ansys Fluent (CFD), SolidWorks (3D modeling/FEA)
Programming: MATLAB, Python, C++ / Arduino

Engineering Disciplines: Gas Turbine Design, Propulsion Systems, Thermal & Structural Analysis, CFD, FEA, Experimental Aerodynamics, Vibration Analysis, Control Systems

Hardware & Lab: Wind Tunnel Operations, Force Balance Instrumentation, Data Acquisition, Signal Conditioning, Gyroscope Controller Development, Soldering & Embedded Systems

Languages: English (fluent), Spanish (fluent)

ADDITIONAL EXPERIENCE

Southwestern College *January 2020 – June 2020*

Calculus & Physics Tutor

- Guided students through thermodynamics, differential equations, and physics fundamentals; developed skill in translating complex technical concepts into accessible explanations — directly applicable to cross-functional engineering communication.

Sweetwater High School *April 2019 – January 2020*

Mathematics Tutor

- Provided STEM instruction support, strengthening ability to break down analytical problems systematically and communicate solutions clearly.