

JACK MURPHY

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EDUCATION

University of California, Los Angeles

Bachelor of Science in Mechanical Engineering, Emphasis in Electrical Engineering

Los Angeles, CA

Expected Mar 2028

- **Cumulative GPA:** 3.64/4.00
- **Club Involvement:** Rocket Project @ UCLA
- **Coursework:** Statics & Strengths of Materials, Dynamics of Particles and Rigid Bodies, Elementary & Intermediate Fluid Mechanics, Thermodynamics, Transport Phenomena, Electrical and Electronic Circuits, Introduction to Computer Science I & II

EXPERIENCE

Oriole Networks

Palo Alto, CA

Mechanical Engineering Intern

May 2026 – Sept 2026

- Established automated engineering workflows using PyCharm/GitHub Copilot, FreeCAD, and Blender to generate parametric CAD models, run automated geometry/QA checks, and produce headless renders (bypasses GUI interaction)
- Developed a scripted CAD to thermal-simulation pipeline to link FreeCAD geometry with Elmer and CalculiX solvers, automate meshing, boundary-condition setup, result extraction, and basic verification checks such as mass conservation or energy-balance
- Built and validated a parametric GPU thermal model using mesh convergence, power sweeps, and convection-coefficient tests
 - Applied sensitivity/optimization studies to evaluate heat and power limits across advanced cooling concepts including vapor chambers, heat pipes, anisotropic materials, and compliant/non-compliant TIMs
- Optimized heatsink geometry and pitch by studying fin efficiency, fill factor, and effective conductance, achieving a 37 W/K effective conductance and 37% fin fill at an 85% fin efficiency ($\tanh(mL)/mL$)

Rondo Energy

Alameda, CA

Test Engineering Intern

Jun 2025 – Sep 2025

- Performed over 300 calorimetry tests and analyzed thermocouple (TC) data to calculate specific heat capacity (C_p) values
- Organized thermal cycling tester and TC measurement locations to test brick reliability under steep thermal gradients
- Compared brick stress behavior with thermal simulation predictions and presented results to Test, Materials, and Thermal teams

PROJECTS & RESEARCH

Carbon Hydrofoil Mast Construction

San Mateo, CA

Independent Engineering Project

Apr 2026 – Jul 2026

- Designed, hand built, and tested a high modulus full carbon hydrofoil mast following a NACA 0012 curve, 120 mm chord
- Programmed 3-axis CNC toolpaths in Fusion 360 to make mold halves for the mast, selected cutting tools, and speeds/feeds
- Wet-laid and pressed unidirectional and $\pm 45^\circ$ biaxial carbon plies (for torsional and linear rigidity) using 2 part 1:1 epoxy system
- Performed FEA in SolidWorks Simulation and physical static load tests under ~ 750 N (bodyweight) to test mast strength
 - Results: 4.6 MPa maximum stress, 0.0143 mm displacement under 2500 N axial load, passed 750 N static test

Computational Fluid Dynamics

Los Angeles, CA

Independent Fluid Mechanics Project

Apr 2025 – Jun 2025

- Conducted basic CFD analysis of F1 front wing using SolidWorks Flow Simulation, Python's NumPy and Matplotlib libraries
- Gathered data using velocity point trajectories, found differentials of up to 90m/s, and calculated downforce using Bernoulli's eq.
- Experimented with advanced mesh refinement and assessed limitations of Bernoulli's eq. versus a Navier Stokes CFD approach

Statistical Entropy

Los Angeles, CA

University Research

Jan 2025 – May 2025

- Assisted Professor David Saltzberg in statistical mechanics research centered around Boltzmann's entropy formula
- Analyzed several statistical entropy derivations and examined extensive vs. intensive thermomechanical parameters

EXTRACURRICULAR

Competitive Sailor

San Francisco, CA

Multiple Boat Classes

Lifelong Involvement

- Coached under two-time Olympian and sports psychologist Udi Gal, training ~ 20 hrs/week throughout high school
- *Notable finishes:* 2023 North Americans (5th), 2021 West Coast US Open (1st), 2025 Rolex Big Boat Series (12th)

ADDITIONAL

Skills: NREMT Certified, Java, Python, C++, MATLAB, SEM, SolidWorks, ESP 32, Fusion 360 CAM, CNC, Composite Layup

Interests: Computational Fluid Dynamics, Cars, Dinghy Sailing, Foiling, Kitesurfing, Mathematics, Mountain Biking, Skiing