COLIN DUFFY

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EDUCATION

University of Southern California – BS – Mechanical Engineering – 3.7 GPA – Magna Cum Laude May 2023
University of Southern California – MS – Mechanical Engineering Dec 2024
THEMATIC OPTION HONORS WRITING PROGRAM

TECHNICAL SKILLS

- SolidWorks, NX, Python, FEA, MATLAB, DFMA, GD+T, C++, PCB Design, CNC, Sheet Metal, Composites, ANSYS FEA

WORK EXPERIENCE

LUMINDT - MECHANICAL ENGINEER - San Francisco, CA Jan 2024 – Present

- Owned all aspects of hardware development for 60kWh unit cell in scrappy stationary energy storage startup
- Led manufacturing of SS316 pressure vessels to ASME VIII, defined WPS, conducted proof tests, strain gauge + NDT qualification
- Released parts into production w/ techniques including sheet metal, CNC, extrusion, weldments, ceramics, plastics, and more
- Executed extensive material test campaign informing production recipe, characterizing thermal response and other properties
- Iterated modular vessel racking system, verified structural performance with ANSYS FEA, built with self-fixturing weldment
- Automated multiple test stands to collect thousands of unmanned hours of cyclic + lifetime performance data
- Developed custom tooling including high-power electric furnace, welding positioner, powder-filling jigs
- Constructed molten salt cell for electrochemical metal production to withstand 1000C in a corrosive environment
- Laid out new office move to 20x larger space, organized material flow, set up large CNC Pipe Bending machine
- Building and coding low-cost 2-axis welding robot with arc height control, integrated in ROS2, designed custom PCBs (ongoing)

LUMINDT - MECHANICAL ENGINEERING INTERN - San Francisco, CA May 2024 – Dec 2024

- Scrappy hardware hacking supporting development of hydrogen energy storage system, designing pressurized fluid systems
- Conducted experimental campaign to characterize thermal control requirements to guarantee energy storage performance
- Developed Hardware-In-Loop system to accelerate control software testing, designed and soldered PCBs in Altium

USC LIQUID PROPULSION LAB - PROPULSION MECHANICAL ENGINEER - Los Angeles, CA Dec 2023 – Present

- Led a small team to design, build, and test a Thrust Vector Control system for precise positioning of liquid rocket engine
- Owned mechanical design and sizing, 10 weeks from clean sheet to robust electromechanical actuators tested at hot fire
- Built thrust takeout weldment + gimbal ring with in-series load cells to reduce pad integration time in the field
- Conducted high-pressure cryogenic cold flows, leak tests, timing tests, and hydrostatic proof tests to qualify propulsion system
- Performed mechanical design and structural analysis supporting development of liquid rocket throttling system
- Sized and selected throttle actuators from valve torque specs, designed steel coupler, and created GD+T drawings for machining

VIRTUAL INCISION - R+D MECHANICAL ENGINEERING INTERN - Lincoln, NE June 2023 – August 2023

- Prototyped using 3D printing, elastomer vacuum-casting, sheet metal, manual + CNC machining for robotic surgery platform
- Interfaced with surgeons to design, prototype, and leak test, sealing trocar surgical port for robot, validated in animal study
- Designed electromechanical test stands quantifying robot performance, automated data collection and report generation

NOVASIGNAL - RESEARCH DEVICE ENGINEER INTERN - Los Angeles, CA June 2022 – August 2022

- Designed clinically relevant hemodynamic flow bench model for verification of cerebral microemboli detection algorithm
- Automated tasks, streamlined data processing, and conducted statistical verification analysis using Python
- Developed test procedures + enhanced workflow, reducing experiment time by 50% and increasing measurement repeatability

LEADERSHIP, PROJECTS, AND INVOLVEMENT

OPENSHOT August 2025 – Present

- Building low-cost auto-surfer-tracking camera and wearable device to pursue engineering under industrial design constraints
- Designed + brought up mixed-signal RF PCB for wearable device, designed waterproof housing with surfacing techniques

PEAKS AND PROFESSORS - PRESIDENT May 2022 – May 2023

- Led operations of USC's largest outdoors club with a data-driven mindset, coordinated over 100+ hiking trips with professors

MECHANICAL ENGINEERING SENIOR DESIGN PROJECT August 2022 – December 2022

- Engineered beanbag-catching robot with optimized PD control system, camera vision input, and robust mechanical design

HOBBIES + PASSIONS

- Surfing, long-distance hiking, playing bass guitar, skateboarding, reading new books, film photography