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

WORK EXPERIENCE

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

- Owned all aspects of hardware development for 60kWh unit energy storage cells at scrappy seed-stage energy startup
- Manufactured SS316 pressure vessels (qty 150) to ASME VIII, defined WPS, conducted proof tests + qualification
- Dropped vessel cycle time from 18 to 4hr w/ improvements to material handling, TIG + activation process, deleted parts
- Responsible for comprehensive material test campaign informing final selection of production recipe ($400k order)
- Designed safety-critical vessel rack structure (qty 10), verified hand calcs w/ ANSYS FEA, built 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
- Building low-cost 2-axis welding robot to automate vessel TIG integrated w/ ROS2, designed custom PCBs (ongoing)

USC LIQUID PROPULSION LAB - PROPULSION ENGINEER / RESPONSIBLE ENGINEER - Los Angeles, CA Jan 2024 – Dec 2024

- Led a small team to realize a Thrust Vector Control system for liquid rocket engine from clean sheet to test in 10 weeks
- Owned full system CAD and electromechanical actuator design, beat performance of $3k COTS part for $300 per actuator
- Built thrust takeout weldment + gimbal ring with in-series load cells to reduce integration time on the hot-fire pad
- Qualified ATLAS propulsion system through high-pressure cryogenic cold flows, timing tests, and hydrostatic proof tests
- 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 released GD+T drawings

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

- Prototyped using 3D printing, elastomer vacuum-casting, sheet metal, lathe, CNC mill for robotic surgery platform
- Interfaced w/ surgeons to design, prototype, and test inflatable 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 neural hemodynamic flow bench model for verification of microemboli detection algorithm
- Developed test procedures + workflows, reducing experiment time by 50%, increasing measurement repeatability 3x

LEADERSHIP, PROJECTS, AND INVOLVEMENT

OPENSHOT August 2025 – Present

- Building auto-surfer-tracking camera and waterproof wearable to pursue engineering w/ 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, coordinated 50 student leads + 100+ hiking trips w/ professors

MECHANICAL ENGINEERING SENIOR DESIGN PROJECT August 2022 – December 2022

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

TECHNICAL SKILLS

- Mechanical: SolidWorks, NX, (solid/surface), ANSYS FEA (Structural + Thermal), DFMA, domestic + global vendor mgmt
- Electrical/Electronics: Python, C++, PCB Design (digital, RF), Linux Shell, Sensor + System Integration (UART, CAN, I2C)
- Manufacturing: CNC Mill, Lathe, GD+T, Sheet Metal Bending, Vacuum Casting, Composite Layups, MIG, TIG (learning)