Joseph Pallan

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Work Experience

Mechanical and Aerospace Engineering Department (MAE) **September 2022 – January 2023**

Teaching Assistant

- Setting up laboratory equipment (Furnace, Microscopes, Tensile testing) for classes.
- Metallographic sample preparation with grinding, polishing, and thermoplastic mounting.
- Rockwell Hardness, and Vickers microhardness testing for carbon-steel samples.
- Imaging using Apreo FEI SEM, with BSE detector for non/conductive samples after strain hardening methods.

Qualcomm Institute **February 2021 – September 2022**

Nano3 Cleanroom Equipment Assistant

- Provided equipment training for sputtering/deposition tools (RIE, PECVD, E-beam, ALD).
- Maintenance of vacuum pumps, spinners, hot plates, sonicators and glass bead blasting.
- Processing, and measurement of thin films for externally affiliated projects.
- Research for substrate uniformity on rotating stage, material tooling factor measurement, helium leak check efficacy.
- Writing SOPs for cleans, troubleshooting, and processing runs for new users.

Projects

Triton Racing – UC San Diego Formula SAE **September 2020 - Present**

Aerodynamics Lead

- Led design, manufacturing, and testing of aerodynamic devices for a formula car.
- Creating steady-state fluid simulations, and parametric studies of individual elements.
- Manufacturing polymer matrix composites with wet layup and compression techniques.
- Mold, and jig design to maximize design for manufacturability and minimize skin friction for efficiency of aerodynamic devices.
- Hardware selection for mounting, and elastic deformation considerations under dynamic load.
- Downforce measurement using half-bridged strain gauges and Arduino DAQ to validate design.

Experimental Techniques **September 2022 – December 2022**

Student Course

- Writing MATLAB scripts to detect aliasing of wave signals and create 3D animated contour plots of wave propagation.
- Using oscilloscopes, waveform generators, and digital multimeters to measure digital to analogue conversion of signals.
- Writing academic papers using results obtained, error estimates, and scientific literature.

Education

UC San Diego **September 2020 – Present**

B.S. Mechanical Engineering (Controls & Robotics MC34)

- GPA: 3.5/4.0
- Relevant Coursework: Signals and Systems, Fluid Mechanics, Machine Learning Algorithms, Solid Mechanics, Dynamics, Thermodynamics, Materials Science, Racecar design

Skills

Software: SOLIDWORKS 3DX, ANSYS Discovery, Autodesk Fusion 360, AutoCAD, HTML, MATLAB
Hardware: Manual/Automatic CNC lathe and mills, Laser cutting, FDM 3D printing, Breadboard prototyping, Waterjetting, Lasercutting, CNC hot-wire foam cutting.