Kaushal Patel

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(818) 434-2822

Education

University of California, Irvine — Irvine, CA

Master of Science, Mechanical and Aerospace Engineering — *September 2022 – June 2024*

- GPA 3.87/4.0
- **Relevant Coursework:** Advanced Dynamics, Finite Element Methods, Engineering Mathematics, Robotics, Lightweight Structures, Atomistic Theories, Structural Mechanics, Mechanics of Solids, Linear Systems, Optimization Methods

Bachelor of Science, Mechanical Engineering — *September 2018 – June 2022*

- GPA 3.73/4.0

Work Experience

Tesla — June 2022 – September 2022

Thermal Engineering Intern — *Fremont, CA*

- Led root cause analysis of failing expansion valves within the critical vehicle-wide heat pump system and identified design changes to bring the system up to compliance with emission standards and move the design forward
- Developed a Python test harness to automate a previously manual process to verify that vendor supplied datasheets were accurate
- Designed a robust sub-scale refrigerant system with CATIA V5 to replace a pneumatic platform for multi-week life cycle testing to characterize component variance and lifetime leakage

Momentus Space — June 2021 – September 2021

R&D Propulsion Engineering Intern — *San Jose, CA*

- Owned the design, build, and Python automation of the power amplifier test bed that controlled thermal components and logged multiple sensors for long duration tests to validate new variants that reduce cost by 40% and increase performance by 30%
- Overhauled vehicle thruster design to mitigate prior plasma instability and temperature limitations to reach operational capacity
- Improved thermal simulation pre-processing procedures through a Python script to speed up preparation by 70%

Academic Experience

Rehabilitation and Augmentation Lab — September 2022 – Present

Graduate Student Researcher — *Irvine, CA*

- Designed a 1kg tethered exoskeleton capable of applying 80 Nm of torque to investigate the efficacy of strength training on the affected leg of stroke patients to measure the improvement in walking quality
- Conducted finite element analysis (FEA) using SolidWorks to design components capable of withstanding specified loading conditions and performed topology optimization to minimize mass while maintaining structural integrity
- Developed a custom load cell with 1000N capacity, 1.5N sensitivity, and repeatability of 1.5% FSO, saving $300 per sensor

UCI HyperXite – SpaceX HyperLoop Competition — June 2021 – June 2022

Chief Engineer — *Irvine, CA*

- Orchestrated project progression, design objectives, and validation procedures across suspension, chassis, propulsion, and pneumatic subsystems to establish functional cohesivity on a team of 23 leading to a successful pod demonstration run
- Achieved an average stopping rate of 1.85G's with 0.5s engagement time to stop a 25mph pod in 4.53ft

Projects

Finite Element Analysis Solver — June 2023

- Finite element solver in Python using Gaussian numerical integration and iso-parametric bi-linear quadrilateral elements
- Generated necessary mesh files and post-processed deformation, stress, and strain contours, programmatically for analysis

CFD Stent Modeling – Tang MicroBioMechanics Lab — August 2021

- Reconstructed arterial stenosis flow conditions in ANSYS Fluent from clinical data to predict post-treatment outcomes
- Published theoretical simulation results that corroborate clinical evaluations – [DOI: 10.1177/15266028221134891]

Devanagari Character Recognition – Supervised Learning — June 2022

- Convolutional network in TensorFlow to classify text with modified model enhancements like batch norm and dropouts
- Explored the original paper's model choices with a multi-class Support Vector Machine for 48 classes of characters

Skills

- **Software:** SolidWorks (CSWA), CATIA V5, ANSYS Fluent, ANSYS Mechanical, Git
- **Programming:** Python, NumPy, Matplotlib, Pandas, MATLAB, Simulink, C++
- **First Principles:** Design, GD&T, Design for Manufacturability (DFM), Modeling, Design for Assembly (DFA), Root Cause Analysis