KISHAN JAGANNATH

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Education

University of Southern California – MS in Mechanical Engineering   Dec 2025
Dayananda Sagar University(India) – BS in Aerospace Engineering   May 2023

Skills

Design & Analysis: SolidWorks, GD&T (ASME Y14.5), DFM/DFA, Mechanism Design, Abaqus (Hyperelasticity, Explicit), Ansys (CFD/FEA), Static Structural Analysis, CATIA V5
Manufacturing & Testing: Composite Fabrication (Vacuum Infusion, Wet Layup), 3D Printing (FDM/SLA), Tensile Testing (Instron), Non-Destructive Testing (Micro-CT), Metrology.
Electronics & Coding: Arduino, Sensors (IMU, Load Cells), Python, MATLAB, C++.

Experience

Graduate Research Assistant, Zhao Research Group, USC – Los Angeles, CA   Jan 2025 – Present
- Engineered a multi-layer flexible composite manufacturing process, integrating **photolithography**, wet etching, and precision blade coating to fabricate electro-programmable clutch arrays with **<50µm layer thickness** control.
- Optimized the electro-mechanical packaging of PVDF-TrFE-CFE dielectrics and copper electrodes, utilizing **Design of Experiments (DOE)** to refine curing cycles and adhesion, achieving a shear force capacity of **43.97 N/cm²**.
- Simulated large-deformation kinematics of fiber-reinforced pneumatic actuators in **Abaqus Standard**, implementing **Mooney-Rivlin** hyperelastic models (Ecoflex 0031) to predict multi-modal twisting and bending.
- Analyzed interlaminar failure modes between rigid-soft interfaces using **Cohesive Zone Modeling (CZM)** and contact mechanics, validating the FEA model against physical tensile data to reduce prototype iteration cycles by **30%**.

Mechanical Engineer Intern, Jio Robotics – Columbia, Maryland   Jan 2025 – Mar 2025
- Engineered advanced robotic end-effectors and modular mechanisms using **CATIA V5** and **SolidWorks**, validating concepts with **DMU Kinematics** to reduce prototyping iterations by **30%**.
- Conducted 1D/3D dimensional variation analysis and Tolerance Stack-up (**GD&T**) calculations on drive modules, resolving interface conflicts to ensure **<1mm misalignment** for precision-fit assembly.
- Applied Design for Manufacturing (**DFM**) principles to actuator mounts and structural components, reducing overall system weight by **4.6%** while maintaining structural integrity under dynamic loads.
- Validated system robustness through rigorous field testing and iterative debugging, integrating vision-based control logic to improve autonomous docking reliability by **25%**.

Teaching Assistant, University of Southern California – Los Angeles, CA   Aug 2025 – Dec 2025
AME 410(Design Theory and Methodology)
- Mentored student teams through the product development lifecycle from **Quality Function Deployment (QFD)** to embodiment design, grading project milestones to ensure compliance with manufacturability and industry standards.
AME 204(Mechanics of Materials and Structures)
- Facilitated learning in **solid mechanics**, clarifying complex concepts in stress transformation and beam deflection, while grading assessments to validate mastery of structural failure analysis.

CFD Engineer Intern, Azper Science – Bangalore, India   July 2022 – Oct 2025
- Optimized the aerodynamic topology of a **contra-rotating propeller** drone, simulating rotor-body interaction and slipstream effects in **Ansys Fluent** to predict thrust loss and stability risks.
- Redesigned fuselage components in **SolidWorks** based on flow trajectory analysis, modifying intake geometry to minimize drag, achieving an **8% improvement** in overall flight efficiency.

Projects

Design & Fabrication of Carbon Fiber Arched Beam   Project Link
- Fabricated a carbon fiber beam via **Vacuum Infusion**, achieving **2,908 lbf** load and **80%** higher energy absorption.
- Engineered a **C-shaped ±45°/0° ply schedule** to mitigate shear failure, validated via **3-point bend testing**.

AI-Driven Defect Detection in Composites (Amazon Research)   Project Link
- Curated a 2,500-image **Micro-CT** dataset for **Amazon**, enabling AI-driven defect detection in aerospace composites.
- Validated void segmentation ground truths, improving **EfficientNet** model accuracy by **60.4% (IoU)**.