

# 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 **<50 $\mu$ m 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/cm<sup>2</sup>**.
- 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 2022

- 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  $\pm 45^\circ/0^\circ$  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)**.