

# Sukanya Puthalapattu

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## Professional Profile

Mechanical Design Engineer with 4+ years of experience in aerospace design, manufacturing engineering, and structural analysis. Skilled in CATIA V5-based aircraft component design, GD&T, tolerance stack-up, 2D drafting, and product lifecycle management (ENOVIA). Strong background in FEA/ANSYS and cross-functional engineering collaboration.

## Core Competencies

- Aircraft structural component design (fuselage structures) and model-based definition (MBD)
- GD&T, functional tolerancing, tolerance stack-up, design for manufacturability
- 2D drafting and engineering drawing interpretation (CATIA V5 Drafting)
- Finite Element Analysis (ANSYS/HyperMesh) and basic structural simulation workflows
- Manufacturing documentation: process flows and visual work instructions
- PLM and data management: ENOVIA LCA; coordination with multi-disciplinary teams

## Education

- **M.S. Mechanical Engineering**, Texas A&M University–Kingsville, USA (2021–2023)
- **B.Tech Mechanical Engineering**, Siddharth Institute of Engineering & Technology, India (2016–2020)

## Professional Experience

### **Design Engineer — Mase Insights LLC (End Client: Spirit AeroSystems / Boeing), Wichita, KS | Feb 2025 – Present**

- Designed, modeled, and validated fuselage structure components for Boeing 777-8F using CATIA V5.
- Developed MBD with GD&T and functional annotations; supported tolerance stack-up and manufacturability considerations.
- Created 2D drawings from 3D models and supported design checks for release actions.
- Maintained product data in ENOVIA LCA and supported cross-team coordination.

### **Manufacturing Engineer — Metrix IT Solutions Inc, Wichita, KS | Apr 2024 – Feb 2025**

- Created visual work instructions in SAP 3D VEA using CATIA V5 and engineering drawings for Boeing 737 programs.
- Developed process flows for manufacturing and supported work allocation tracking and shop-floor collaboration.

### **Quality Engineer — CloudData Technology LLC, Fort Worth, TX | Oct 2023 – Apr 2024**

- Reviewed validation and change control documentation (IQ/OQ/PQ), and supported CAPA documentation workflows.
- Performed quality documentation gap analysis aligned with EU MDR/MDD expectations.

### **Computer Aided Design Engineer — AllReach Technologies, Bangalore, India | Aug 2020 – Jul 2021**

- Developed 3D CAD models and 2D drawings for gas turbine engine compressor components using SolidWorks and AutoCAD.
- Performed structural analysis on turbine components using ANSYS APDL/Workbench; improved mesh quality metrics.

### **Intern Engineer — Sibar Auto Parts Ltd, India | May 2019 – May 2020**

- Supported quality inspection of cast components using precision measurement tools and GD&T interpretation.
- Contributed to corrective and preventive action documentation (8D, FMEA) and SOP support.

## **Publications (Accepted and presented at international conferences; publication in IEEE Xplore and Springer proceedings in process)**

- Turbulence Model Sensitivity for Parachute-Like Bodies: A RANS Comparison.
- Replicating Extreme Maneuvers of Anna's Hummingbirds Using a Small Indoor Quadrotor: A Simulation and Proof-of-Concept Approach.
- Efficient Nonlinear Solid Mechanics Computation via Krylov Subspace Methods in a Finite Volume Framework.
- Optimization of Honeycomb Structure for Battery Pack Enclosures in Electric Vehicles.
- Thermal Transport in Engineered Nanostructures: Disruptions in Phonon Dynamics Due to Interface Modifications.
- AI-Optimized Mechanical Design of EV Suspension Systems for Superior Performance and Durability.

## **Published in IEEE**

- Design Considerations for Material Selection and Assembly of Battery Packs in Compact Electric Vehicles.

## **Academic Experience**

### **Projects**

#### **Design and Analysis of Double-Propeller Hexacopter**

Designed a Double-Propeller Hexacopter and conducted motion analysis using SolidWorks software to optimize performance, altitude maintenance, and hovering conditions. Implemented enhancements to improve the overall efficiency of the system.

#### **Heart Disease Probability Prediction**

Conducted binary logistic regression analysis in Minitab software to predict the probability of having heart disease based on global data across various age groups. This project involved analyzing and interpreting patterns within the dataset, contributing valuable insights into the likelihood of heart disease.

#### **Modeling and Analysis of Two-Wheeler Frame**

Executed the Modeling and Analysis of a Two-Wheeler Frame using CATIA V5 software and Ansys Workbench, focusing on design, structural analysis, and weight reduction. Conducted stress and deformation calculations under various load conditions, identify failure modes through modal analysis and achieved a 26% weight reduction by optimizing dimensions.

## **Professional Memberships**

- Femington — Senior Member
- SAS (Scholars Academic & Scientific Society) — Eminent Fellow Member
- Society of Women Engineers (SWE) — Member (2023–Present)

## **Technical Skills**

- **CAD/Design:** CATIA V5, SolidWorks, AutoCAD
- **Analysis:** ANSYS (Workbench/APDL), HyperMesh, FEA, MATLAB
- **PLM/Tools:** ENOVIA LCA, SAP 3D VEA, SAP Logon
- **Engineering:** GD&T, tolerance analysis, engineering drawings, manufacturing processes

## **Certifications**

- CATIA V5
- SolidWorks CSWP
- AutoCAD
- HyperMesh
- ANSYS Workbench
- MATLAB