Muhammad Ibrahim

Undergraduate Mechanical Engineer at Institute of Space Technology
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Summary

Mechanical Engineering undergraduate with 3+ years of experience in CAD modeling, FEA, CFD, and structural analysis. Proficient in SolidWorks, ANSYS, and Abaqus for design validation and simulation. Skilled in optimizing mechanical systems for performance, reliability, and manufacturability across aerospace and industrial applications.

Skills

- **CAD**: 3D modeling, detailed drafting, and design validation (experience with SolidWorks)
- **FEM & CFD Analysis**: Structural, thermal, and fluid flow simulations; static & dynamic analysis, Mesh generation, fatigue & fracture mechanics (using ANSYS, Abaqus, OpenFOAM, COMSOL).
- **Simulation & Optimization**: Multiphysics simulation, topology optimization, design optimization, and performance prediction under real-world conditions.

Experience

Aerospace Design and Simulation Engineer (Intern) **July, 2025 – Present**
National Aerospace Science & Technology Park (NASTP) *Rawalpindi, Pakistan*

- Performing aerodynamics and CFD simulations (Ansys & Icepak) to optimize UAV and drone performance.
- Designing and analyzing structural components for UAVs, focusing on durability, weight reduction, and reliability.
- Conducting thermal and modal analyses to predict failure modes and enhance aerospace system efficiency.

Mechanical Design Engineer (Intern) **July, 2024 - Aug, 2024**
Heavy Industries Taxila *Taxila, Pakistan*

- Led the design and analysis of mechanical components for industrial machinery, improving durability and performance through structural optimization.
- Developed CAD models and detailed drawings using SolidWorks, ensuring manufacturability and compliance with engineering standards.
- Performed stress, thermal, and fatigue analysis using ANSYS to enhance product reliability and longevity.
- Collaborated with multiple departments to refine product designs based on simulation results and real-world performance feedback.

Projects

Final Year Project

- I am conducting CFD-based research on the combustion chamber of Rotating Detonation Rocket Engines (RDREs) to analyze detonation wave behavior and chamber performance. The goal is to develop a validated model that supports future experimental implementation of RDREs.

CFD Aerodynamic Analysis of EBW-160 Blackwing

- Conducting computational fluid dynamics (CFD) simulations to evaluate aerodynamic performance of wing foils for the EBW-160 Blackwing UAV.
- Analyzing lift, drag, and flow characteristics to validate design efficiency and flight readiness.
- Optimizing wing geometry to enhance stability, performance, and practical feasibility for flight operations.

Education

Institute of Space Technology **Sep, 2022 – Sep, 2026**
Bachelor of Engineering in Mechanical