Shubham Ambekar

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Summary

Mechanical Engineering Grad Student at **(4.0 GPA)** specializing in Advanced Manufacturing and Computational Design. Expert in utilizing **CAD/CAM/CAE** suites including NX, SolidWorks, and Ansys to engineer high-performance systems for **Formula SAE, Anti-drone technology, and AI-driven manufacturing automation**. Proficient in optimizing for manufacturability **(DFMA)** through hands-on experience in composite **vacuum infusion**, additive manufacturing, and production management, while validating computational models via **ASTM-standard** physical testing.

Education

University of Southern California *(M.S in Mechanical Engineering)* Jan 2025 – Present | Los Angeles, USA
GPA: 4.0/4.0
Coursework – Design for Manufacturing Assembly, Advanced Mechanical Design, Finite Element Analysis, Computational Design of Machine Components, Advanced Computational Design & Manufacturing.

Savitribai Phule Pune University *(Bachelor of Mechanical Engineering)* Aug 2021 – Jul 2024 | Pune, India
GPA: 3.4/4.0
Coursework – Kinematics of Machinary, Applied Thermodynamics, Heat and Mass Transfer, Design of Machine Elements, Design of Transmission Systems, HVAC and Refrigeration, Turbomachinery, Fluid Mechanics, Additive Manufacturing, Quality and Reliability Engineering

Professional Experience

USC Formula SAE Racing Team, *Mechanical Design Engineer* Aug 2025 – Present | Los Angeles, USA
Working in vehicle design team for Supra SAE, overseeing CAD modeling, chassis optimization, and component integration using SolidWorks and ANSYS to enhance performance and safety. Coordinating a multidisciplinary team to ensure manufacturability, weight reduction, and compliance with SAE design standards.

BEACON SolidWorks, *Application Engineer* Jun 2024 – Nov 2024 | Pune, India
Responsible for providing post-sales technical support for SolidWorks, which included installation, license setup, and configuration for newly purchased licenses. I conducted SolidWorks Essentials training sessions for client staff to ensure smooth adoption of the software and acted as a primary point of contact for troubleshooting and resolving technical issues. Additionally, collaborated with Dassault Systèmes by attending key seminars and technical sessions to stay updated on the latest tools and best practices, ensuring clients received high-quality support and guidance.

Bharat Electronics Limited, *Design & Development Intern* Feb 2023 – Mar 2023 | Pune, India
Designed and developed critical components for high-energy directed systems at Bharat Electronics Limited, leveraging SolidWorks and Ansys for advanced simulations. Optimized design processes to enhance efficiency and innovation in anti-drone technology.

Renuka Forge, *Machine Floor Manager* Jul 2019 – May 2020 | Moshi, India
Managed daily production operations at Renuka Forge, ensuring timely achievement of manufacturing targets. Assisted machine operators with process challenges, coordinated with vendors for raw materials, and maintained customer relations by addressing defects and improvements. Oversaw overall workflow efficiency in a management-focused role.

Projects

AI Assisted Planar Slicing for 3D Printing Sep 2025 – Dec 2025
Engineered ”Smart Orient” algorithms utilizing Monotone Chain convex hull analysis and weighted cost heuristics to automate optimal build orientation for stability and support reduction. Implemented ”AI Planar Slicing” via spatial grid discretization and surface normal deviation analysis to dynamically modulate layer thickness, optimizing geometric fidelity versus print time. Architected ”MotoMind,” an agentic AI integration utilizing Gemini 2.5 Flash and a ”Retrieve-Reason-Act” loop with strict JSON schema enforcement for autonomous slicing parameter tuning.

Design, FEA & 3D Printing of a Hat-Stiffened Fuselage Sep 2025 – Dec 2025
Designed a hat-stiffened fuselage in Siemens NX and validated structural integrity via linear static FEA (NX Nastran) under 1000 lbf compressive loads. Conducted physical compression testing on 3D-printed prototypes to verify FEA predictions against strict 6-inch crumple zone and 100 lbf load requirements.

Design and Development of a Rescue Assistance Rover Aug 2023 – Apr 2024
Designed and developed the Rescue Assistance Rover (RAR), a robust disaster response vehicle equipped with advanced sensors and autonomous navigation capabilities. Engineered a rocker-bogie suspension system with Ackerman steering for superior mobility across complex terrains and obstacle negotiation.

Technical Skills

CAD, CAM, CAE, CFD, FEA, NX, SolidWorks, CATIA, Ansys, Multi Body Dynamics, Design for Manufacturing and Assembly (DFMA), MATLAB, Mechanical Systems, HVAC, Fluid Mechanics, Additive Manufacturing, Mechanical Manufacturing Experience, Injection Molding, Quality Assurance, Structural Engineering, JavaScript, C++, Python, Artificial Intelligence, Machine Learning, Product Design, Process Development.

Research & Publications

Advance Composites & Design Lab, *Composite Student Researcher* Aug 2025 - Present
Designing, manufacturing, and testing high-performance glass fiber, carbon fiber composite square beams for annual SAMPE student composites competition. Specialized in vacuum infusion techniques, optimized lay-up schedules, and performing ASTM standard mechanical testing to achieve maximum strength-to-weight ratios.

Design & Development of Rescue Assistance Rover for Land-Based Operations Jul 30, 2024
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