

# Omkar Pawar

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## EDUCATION

North Carolina State University, *Masters of Science in Mechanical Engineering*

August 2024 – May 2026

GPA: 3.56/4.0

Coursework: AI-Driven Engineering Design, Metal Additive Manufacturing, Design of Electromechanical Systems

MPSTME, NMIMS University, *Bachelor of Technology in Mechanical Engineering*

August 2020 – May 2024

GPA: 3.13/4.0

Coursework: Design of Machine Elements, Computational Fluid Dynamics, Additive Manufacturing, Machine Design

## SKILLS

**Technical Skills:** 3D CAD design, 3D modelling, 3D Scanning, 3D Printing, Finite Element Analysis, Advance Precision Manufacturing, Additive Manufacturing, Reverse Engineering, Computational Fluid Dynamics, Python

**Software Skills:** SolidWorks, CATIA, ANSYS, AutoCAD, REVIT, FTI Forming Suite, FTI Automated Costing Software, PLM, TCUA, VISI Reverse, MATLAB

## EXPERIENCE

Mechanical Airframe Designer Intern | Hindustan Aeronautics Limited | Nashik, India

December 2023 – April 2024

- Coordinated fastener design with **CATIA** using company standards and designed the aircraft air intake by solving differential equations using **M.S. Excel**, **generated 70%** of the outer skin for manufacturing readiness
- Applied **3D scanning** and **3D modeling** with **reverse engineering** techniques using **VISI Reverse** to improve **model generation efficiency by over 65%**
- Delivered over **20+ aircraft parts** and skin models using a **smart-scan scanner**, enhancing the design portfolio for a future project

Costing Engineer Intern | Tata Motors Limited | Pune, India

May 2023 – July 2023

- Contributed to the Should Cost estimation techniques with around 5% cost reduction Body and Trim by calculating the **maximum yield %** of the metal parts using the best profile which has **more than 80% yield**
- Directed the implementation of **FTI ACS software** from Hexaware Technologies, improving project workflow **efficiency by 30%**
- Leveraged **FTI Forming suite, TCUA, and PLM** to generate detailed cost reports, boosting **efficiency by 10%** and **reducing costs by \$30,000** through accurate 'should cost' calculations for sheet metals and body trims

## PROJECT

Design of Integrated EAHE system for reduction of power consumption from Air Conditioners

January 2025 – Present

- Designed an **Earth Air Heat Exchanger**, seamlessly integrating it into existing air conditioning units, Achieved a **15-20%** reduction in overall energy consumption and increased system efficiency
- Generated AI models for interpreting future temperatures considering past data for the temperature of Raleigh for a room of 50m<sup>3</sup> using **Auto Regressive Integrated Moving Average** with **statsmodels** library in Python language

Design of Control Box for Robotic Arm of Exoskeleton

September 2024 – December 2024

- Assembled a design for a control box structure for 9 PCBs, accumulators, batteries, pumps, and valves, delivering a 3D CAD model that improved assembly **efficiency by 25%** and streamlined testing
- Created **SolidWorks** models for electrical components, ensuring 100% fit with **0.1mm accuracy** using **GD&T**, 3D printed 3 models using the **FDM process and PLA as material**,
- Attained **95% alignment accuracy** with Bamboo Slicer software, ensuring precise fit and functionality for the project

Structural and Numerical Analysis of Bladeless Wind Turbine

August 2023 – November 2023

- Engineered a **3D model** of a Bladeless Wind Turbine in **SolidWorks**, applying formulas from prior research to create the design
- Conducted **stress analysis** and load calculations on the structure using **20 years** of weather forecast data
- Selected Ambara, Gujrat (23.93°N, 69.85°E) as the test location for the project, assessing its medium population and **altitude of 320m** above sea level to assess the feasibility of meeting India's weather conditions
- Performed **ANSYS simulations** with an **inlet velocity of 15.6 m/s**, generating **Cd (8.4), Cl (8.18)**, and a **deflection of 0.57m**
- Refined meshing by using **2 element sizes 30mm and 20mm** for outer and inner surfaces to accurately model vortex formation
- Published a paper at the Conference book - E2A - Emerging Electronics and Automation (2023) "[https://doi.org/10.1007/978-981-97-6802-8\\_18](https://doi.org/10.1007/978-981-97-6802-8_18)"

Thermal Analysis of Different Shapes of Fins using Ansys

May 2023 – July 2023

- Conducted **analysis of heat transfer efficiency** in different fin geometries using **Ansys**, evaluated straight, pin, triangular, and straight with round edges using grey cast Fe, Cu, and stainless steel giving the outcome that Pin fin was **57% more effective** than straight fins
- Wrote a paper currently under review for the **Journal of Thermal Analysis and Calorimetry (2023)**