

Curriculum Vitae

Nandula Mayukh
Mechanical Engineer

Personal Details:

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Summary

Mechanical Engineer with cross-industry experience in product development, prototyping, and tool design. Skilled in CAD, drafting, and analysis with a tool-agnostic mindset tailored to customer needs, investor goals, and industry standards. Passionate about building efficient systems in design, documentation, or process optimisation. Continuously focussed on manufacturability, cost-effectiveness, and lifecycle durability. Proven ability to lead projects end-to-end, delivering functional, scalable, and innovative solutions.

Skills and proficiency

Proficiency rated out of 5

Mechanical CAD & Drafting

Tool-agnostic modeling

- *Inventor, SolidWorks, Onshape, BricsCAD, Alibre* *****
- *Script Based CAD software : OPENSCAD* ****
- *Non traditional: Blender* ***
- *Assembly modelling (BOM compliant)* *****

Derivative drawings

- *Compliance with customer and industry requirements* *****
- *Reduced downtime of drawings submission using automation* ****

Product Design

Market Analysis and gap identification

- *Creation of multiple designs to test the best fit in the market* ****
- *R&D of product with respect to specifications* ****
- *Comparative design submission to sales team* ****

E2E BOM

- *Modelling the product and maintaining the full BOM* *****
- *Auto comparison of similar products* *****
- *Costing with supply chain considerations* ****
- *Manufacturability and process efficiency* ****
- *Tool and Die dimensions and heuristic lifecycle calculation* *****
- *Prototyping of tools for shop-floor* *****

Reverse Engineering

- *Competitor product reverse engineering* *****
- *Using professional LiDAR equipment* ****
- *Using photogrammetry* ****
- *Using traditional methods (Caliper and micrometer measurements)* *****

In-house product improvement

Commercial Grade Plastic Knowledge

- *HDPE (High Density Polyethylene)* *****
- *PP (Poly Propylene)* ****
- *LDPE (Low Density Polyethylene)* ****

Shopfloor and Industry Standards

Machine Understanding

- *Injection Molding Machine (IMM)* ****
- *Extrusion Blow Molding (EBM)* *****
- *Injection Blow Molding (IBM)* ****
- *Caps Compression Molding (CCM)* *****

Safety and Compliance

- *GMP* ****
- *GDP* *****
- *EHS* ****

Standards

- *ISO 9001:2015* ****
- *ISO 15378:2015* ****
- *ISO 2768* *****
- *US FDA 21 CFR* ****
- *ISO 8317 & ASTM D3475 (Child Resistant Packaging)* ****
- *HIRA* ****

Fabrication and Prototyping

3D Printing

- *Initial design for R&D, customer interaction or teaser* ****
- *Testing function and fit* *****
- *Replacement of worn/broken tools* ****
- *Printing using engineering Filaments such as PETG, PA12, PEEK* *****
- *Reducing cost and lead-time by manufacturing in-house.* ****

Laser Cutting

- *Wood cutting of complex shapes* *****
- *Tool path and yield optimisation* ****
- *Metal Engraving* ****

- *Refractive metal surface finish* ***
- *Acrylic Cutting* *****

2.5 Axis Machining

- *Complex shape and profile using open-source CNC software* ***
- *Tool repository creation for m/c capability mapping* *****
- *Surface engraving* *****
- *Sheet metal cutting* ***

3 Axis Machining

- *Tool path optimisation @ design stage* ***
- *G-Code using open-source software (Linux CNC)* **

Welding

- *Basics of Arc welding for MS* **
- *Basics of MIG for stainless* **
- *Soldering of copper and brass (tinning)* **

Analysis

Cost and Life Analysis

- *Costing of Product* *****
- *Cost reduction analysis* ***
- *Process inefficiency identification* *****
- *Tool life estimate based on use, shots, cycles* *****
- *Estimation of rejection increase in plastic manufacturing* *****

Finite Element Analysis (FEA)

- *Stress / Strain analysis* *****
- *Using licensed tools: ANSYS Mechanical* *****
- *Using open-source tools: FreeCAD Simulation* ***

Computational Fluid Dynamics (CFD)

- *Aerodynamic analysis (sub-sonic)* *****
- *Lift, Drag, stresses on lifting bodies* *****
- *Analysis conducted using ANSYS Fluent and xflr (open-source)* *****
- *Super-sonic systems analysis using ANSYS Fluent* ***

Documentation and Planning

SOP Creation

- *Procedure documentation* *****
- *Proof-reading, error identification and conflicting process avoidance* *****
- *Cross-functional impact mapping* *****
- *Flow visualisation* *****

Excel

- *Recording dimensions and BOM for cross-departmental use* *****
- *Project planning* *****
- *SPOC assignment* *****
- *Lead time visualisation in Gantt format* *****
- *Automating recurring calculations* *****
- *Residual analysis* *****
- *Department wise use-cases* *****

Report Automation

- *Comparison reports between similar products in catalog* *****

- *Revision reports of a specific product* *****
- *Summary of work done over time on m/c* *****

Automation

Microsoft Power Apps

- *In-house application creation for existing processes* ***
- *Reducing paper-trail in shop-floor* ***

VBA Scripting

- *Compliant with Microsoft Applications* ***
- *Used in conjunction with Excel* ***

Machine Process Automation

- *Identification of inefficiency in m/c cycle* ****
- *Improvements made in the Poka Yoke method* ****
- *Kaizen implementation* ****

Graphic Design

Investor Pitch Decks

- *Company SWOT* ****
- *Timeline visualisation* ****
- *Invested capital visualisation* ****
- *CapEx and OpEx breakdown* ***
- *ROI of invested capital and exit strategies* ****
- *Attention diversion to novel points and key elements* ****

Expo Posters

- *Creation of wall-to-wall posters using expo specifications* ****
- *Over-arching theme and storytelling through design* ****
- *Compliance with expo rules and vendor interactions* ****

Brochure and Marketing materials

- *Tri-fold brochure as handouts* ****
- *Company LinkedIn account management* ***
- *Marketing and strategy to increase viewing online* **

Miscellaneous

- *Plant Layout for visualisation* ****
- *M/c approximations for movement and installation* ****
- *Tokens for customer visits @ expos/audits* ****

Education Roadmap

Secondary Education (Science)

P. Obul Reddy Public School, 2017 – 2019

Grade: 79%

Relevant Study: Mathematics, Physics and Chemistry

Hatha Yoga Certification

Sadhguru Gurukulam (formerly Isha School of Hatha Yoga), 2019

Fully certified

Bachelor of Technologies, Mechanical Engineering*

Mahindra University, 2020 – 2024

CGPA: 6.9/10

Relevant coursework:

Computer Aided Design : A+

Design of Machine Elements: B+

Manufacturing Processes I : B+

Manufacturing Processes II : B+

Material Science: B+

Project 3rd Year: 10/10

Project 4th Year: 9/10 (external evaluation)

**Detailed projects listed below*

Professional Experience Roadmap

INDUSTRIAL DESIGN ENGINEER

Product Armor Packaging Pvt. Ltd. | July '24 – Present

- Created product drawings (customer facing) for new products
- Oversaw CAD across departments
- Led all rapid prototyping of products using 3D printing
- Spearheaded 2 new products from phase 0 • Authored standardized SOPs
- Built automated applications reducing down-times • Maintained centralized Product Master
- Automated report generation and analysis • Procured raw materials for trial runs
- Assessed Tool & Die performance mold life • Planned project timelines • Designed graphics for investor and client communication

INDUSTRIAL DESIGN ENGINEER INTERN

Product Armor Packaging Pvt. Ltd. | June '24

- Created technical drawings • Developed CAD models • Designed graphics for internal and external use

MECHANICAL CONSULTANT

Harvested Robotics | December '23 – April '23

- Designed fixturing parts of flagship product earning co-inventor recognition in submitted IP

MECHANICAL DESIGN INTERN

Kritsnam Technologies | July '23 – August '23

- Designed in-house testing tools (CAD) reducing testing time • Improved iterations of flagship product

RESEARCH & CONTENT INTERN

Centella Scientific | January '22 – March '22

- Authored technical articles and content for research scholars and academic audiences

RESEARCH INTERN

Dhruva Space | June '21 – September '21

- Shortlisted sensors for integration in CubeSats • Parsed technical specifications

Projects

University Projects

- Design and manufacturing for Robocon 2022

Team Mahindra, representing Mahindra University

Goal of competition: Robots playing seven stones (colloquially known as Lagori)

- Designed the structure of 2 robots to be able to bear dynamic loads.
- Fabricated and tested pulley, lifting, omni wheel and ball shooting mechanisms
- Cleared the Design round and inspection with no observations
- Travelled to Delhi where the team progressed to semi-finals

- Creation of fixed wing plane for SAE ADDC 2022 and 2023

Team Kaze, representing Mahindra University

Goal of competition: maximise load factor

- 2022: In charge of 2 meter wing design, wing fabrication and landing gear design.
 - Successfully flew the plane at a load factor of 1
 - Ranked 23rd in the nation for our design
- 2023: earned captaincy of regular class team (2m wing span)
 - Led team to clear all design documentation and inspection rounds with no observations
 - Mentored team to present data, gaining compliments from judges for team coordination
 - Ranked 22nd in the nation for our design

- Scanning of objects with LiDAR

*3rd Year individual project under Dr. P. Kondaiah,
Dept. of Mechanical Engineering, Mahindra University*

Problem Statement: To understand the working of reverse engineering tools, the data used, and recreate the same to whatever degree possible.

- Developed a Meshing subsystem using MATLAB that is functional for most point clouds, with dynamic attributes to change the resolution of the mesh.
- Used industry standard LiDAR scanner to map out different objects, creating a reverse engineering process flow that is still used in the University
- Created a object scanner with commercially available LiDAR scanner, and used the prior developed meshing system to output a CAD model, thereby creating a low resolution 3D scanner.
- Earned a 10/10 on the project from my Mentor

- Propulsive Efficiency of a SCRAMJET Engine

4th Year group project under Dr. Debasis Chakraborty

Head of Department, Mechanical and Aerospace Engineering, Mahindra University

Problem Statement: To validate the experimental procedure conducted by G.Yu, J.G Li, X.Y Chang and L.H Chen in their seminal paper titled "Fuel Injection and Flame Stabilization in a Liquid-Kerosene-Fueled Supersonic Combustor" in ANSYS fluent

- Led the project to understand the source material, residuals and overarching theme of research paper
- Recreated the experimental setup in CAD and optimised Mesh for analysis
- Accurately simulated non-combusting supersonic flow in the SCRAMJET engine and validated the pressure spikes and shock waves present.
- Earned a 9/10 from our Mentor and external evaluator

Professional Projects

- Design and optimisation of sensor testing device

Kritsnam Technologies

- Led the design of an in-house testing device which aligns testing sensor with product output sensor reliably.
- Design accounted for long life of moving parts (hinge) and kept the BOM small by designing all moving mechanisms to be printed in place.
- Reduced cost by dividing critical and non-critical parts and assigning materials accordingly.
- Mechanism is still used, and is now part of shop-floor workflow.

- Design aspects of Rakshak™ and fixtures.

Harvested Robotics

- Designed gimbal fixtures, mirror holding and CO2 tube mount for initial design of flagship product
- Created and verified the drawing and fabrication of tractor mount
- Tested in Mahindra tractor facility, and provided inputs for the future of the product.

- 180 cc bottle for oral tablets (pharmaceutical application)

Product Armor Packaging Pvt. Ltd.

- Led the design of a prevalent variant of primary packaging and conducted market analysis to see the variations in competitor dimensions
- Finalised dimensions for multiple customer requirements with industry acceptable tolerance
- Coordinated with mold manufacturer for expedited delivery
- Conducted Factory Acceptance Test and Site Acceptance Test of mold, which was passed by the Quality team
- Conducted trials, associated reports and maintained overall timeline of project

- 45 mm Child Resistant Closure for pharmaceutical application

Product Armor Packaging Pvt. Ltd.

- Built the project timeline from phase 0, with considerations of every departments requirements and mapped it out using a Dynamic Gantt Chart made in-house.
- Designed, prototyped, tested and validated the final model.
- Reduced cost at every turn of the project, including but not limited to
 - Mold • Gantry Crane • Fixtures • Pallets
- Calculated dynamic utilisation of mold and machine capacity, with links to available manpower, which is now used to map out all other projects.
- Set the precedent for accountable design by taking multiple prototyping phases, testing with users and refining the design before manufacturing.

Individual and Personal Projects / Achievements of note

- Homelab

- In an effort to reduce cloud storage costs, a subsystem was created for picture and file storage using Immich and Samba, accessible from anywhere in the world via Tailscale. A small scale project, but something to be proud of.

- 3D printing Automation

- Invested in a Bambu Labs P1S, and became a vendor for my employer for reverse engineered tools, prototypes and parts.
- Automated planning and workflow such that the part cost is calculated dynamically and an invoice is generated after the model has been sliced

- Yoga

- Taught classes to children and adults, with visible results and improved health.
- Over 80+ hours of teaching achieved, while studying and interning