

Professional Profile

Mechanical Engineer operating at the intersection of design, controls, simulation, and testing, trusted for engineering judgment in early-stage product development and interdisciplinary R&D environments.

Professional Experience

Mechanical Engineer

Jan 2025 – Present

Savtoa Software Technologies

- Serve as the primary mechanical decision point within an interdisciplinary R&D team, bridging mechanical design, control algorithms, electronics, and testing during early-stage autonomous system development.
- Defined mechanical and control-system architecture for an internal R&D autonomous platform, including system geometry, control-surface sizing, actuator placement, and active control logic, using first-principles calculations and iterative physical testing.
- Established iteration strategy and test sequencing across multiple hardware revisions, organizing system-level testing, reviewing multi-domain logs (mechanical, electronics, and software), and translating test outcomes into targeted design and control updates.
- Reduced early-stage system risk by enforcing disciplined design choices around failure modes, resisting premature integration and over-complex solutions, and prioritizing modularity, active control, and comprehensive data logging.
- Designed and implemented internal engineering tools to visualize and analyze multi-source test logs, enabling derived-signal evaluation, faster failure diagnosis, and data-driven iteration decisions across mechanical and control domains.
- Improved cross-functional execution by introducing lightweight engineering processes, including structured technical syncs, shared analysis workflows, and clear ownership boundaries between mechanical, electronics, and software teams.

Graduate Apprentice Trainee

Aug 2024 – Dec 2024

EIMCO Elecon R&D

- Transitioned from routine CAD support to advanced FEA and failure analysis responsibilities within the first month, reflecting growing trust in analytical judgment and problem-solving capability.
- Contributed to crack failure analysis of underground mining equipment by validating load conditions from data sheets, evaluating multiple design alternatives under tight deadlines, and achieving improved factor of safety while reducing component weight.
- Accelerated FEA turnaround time by identifying system-level and workflow inefficiencies, introducing performance-aware simulation setups and multi-load-case analysis strategies, and validating improvements with vendor support before broader adoption.
- Gained hands-on exposure to engineering data and configuration management practices using PTC Windchill within an R&D environment.

Plant Technical Supervisor (R&D)

Nov 2020 – Aug 2021

MRF Ltd., Dahej, Gujarat

- Coordinated tyre testing activities to support BIS certification and introduction of new specifications and models into production.
- Assisted in reducing early-stage defects during new product introduction through data-backed analysis, shopfloor coordination, and cross-functional communication.
- Gained hands-on exposure to TPM, 5S, safety practices, and plant-scale manufacturing workflows.

Selected Technical Projects & Competitions

National CFD Competition (All India Rank 2)

- Achieved AIR 2 by applying first-principles CFD reasoning, boundary condition validation, mesh independence checks, and iterative simulation refinement under competitive constraints.

SAE E-BAJA (Drivetrain & Roll Cage Design)

- Contributed to drivetrain architecture and roll cage structural analysis, balancing performance, reliability, safety, and manufacturability across iterative builds in a multidisciplinary student team.

Numerical Study on Heat Distribution and Effect of Burner Configuration in Plate Conveyors

Final Year Project — International Congress on Thermal Analysis and Calorimetry, IIT Madras

- Conducted CFD-based thermal analysis of a plate conveyor system using ANSYS Fluent, evaluating heat distribution across four burner configurations under stationary and moving plate conditions.
- Identified the most efficient burner arrangement by statistically comparing temperature uniformity using standard deviation as a performance metric.
- Analyzed the impact of plate motion on heat distribution by comparing stationary and dynamic configurations across multiple burner layouts.
- Evaluated simplified plate motion modeling approaches by comparing mesh motion and solid motion methods to balance accuracy and computational efficiency.

Technical Skills

- **Engineering & Analysis:** Mechanical system design, failure analysis, first-principles calculations, system stability analysis
- **CFD & Simulation:** ANSYS Fluent, SimScale, OpenFOAM (full workflow setup and case configuration with AI-assisted tooling), ANSYS Static Structural, Creo Simulate, XFLR5
- **CAD & Design Tools:** SolidWorks, AutoCAD, Onshape, FreeCAD
- **Programming & Automation:** Python (engineering workflows, data analysis, visualization), C++ (beginner-level), workflow automation and dashboard creation using Microsoft Office, Google Workspace, and LibreOffice
- **Testing & Manufacturing:** Prototype testing, instrumentation, iterative validation, shopfloor exposure

Education

Bachelor of Technology (B.Tech) in Mechanical Engineering

TKM College of Engineering, Kollam

2024

Diploma in Mechanical Engineering

Carmel Polytechnic College, Punnapra

2020