

UDAY KUMAR

R&D Engineer — CAD/CAE-based Product Development, Automotive, Automation & Heavy Machinery AND Manufacturing

🌐 Portfolio 📩 udaykumarborale9@gmail.com 📞 +91-8660272709 💬 linkedin.com/in/udaykumarborale

Professional Summary

An accomplished **R&D Engineer** specializing in **Powertrain design**, advanced **product development** for automotive, automation, and heavy machinery sectors. Proven ability to transform complex concepts and research into **reliable, manufacturable solutions** that align with **global industry standards**.

Skilled in the **full product development lifecycle**, from **concept ideation to production readiness**. Track record of delivering **lightweight, cost-effective, and optimized components** that meet rigorous **performance, durability, and manufacturability standards**.

Focused on **research-driven engineering**, leveraging cutting-edge technologies to enhance product **quality, repeatability, and efficiency**. Expertise in **3D CAD modeling, FEA, and system integration**, driving the development of automotive, industrial, and automation systems.

Proficient in **Siemens NX, CATIA, PTC Creo, Autodesk Inventor, and ANSYS**, creating **models, assemblies, and FEA solutions** for cross-functional collaboration. Committed to **innovation, continuous improvement**, and developing **future-ready platforms**.

Core Competencies

- **Powertrain Design**, Heavy Machinery & Automation Systems, Precision Engineering, 3D CAD Modeling, Research-Driven Engineering, and Product Development.
- **Finite Element Analysis (FEA)**, Design for Manufacturability (DFM), Assembly (DFA), Process Optimization, ASME Y14.5, ISO 1101.
- **Geometric Dimensioning & Tolerancing (GD&T) (ASME Y14.5)**, Technical Drawings, BOM Management, Tolerance Analysis, PLM/PDM Workflows, CAD/FEA Workflow Automation.

Technical Skills

- **3D CAD Software:** Siemens NX, CATIA V5, PTC Creo, Autodesk Inventor, SolidWorks, AutoCAD.
- **Simulation & Analysis (FEA):** ANSYS Mechanical Workbench, Hypermesh, ANSA, MATLAB.
- **FEA Capabilities:** Static Structural Analysis, Modal Analysis, Load Case Definition, Boundary Conditions, Stress and Deformation Evaluation, Mesh Generation and Optimization, Design Validation.

Professional Experience

Chropynska India Private Limited

R&D Engineer – Powertrain Design

Oct 2025 – Present

- Advanced engineering and R&D company focused on automotive and automation systems, specializing in **Powertrain & BIW components**, product concept development, detailed design, and validation.
- Spearheaded the design and development of **Powertrain components**, significantly enhancing structural integrity, performance, and manufacturability.
- Delivered **100+ CAD models and assemblies**, utilizing Siemens NX, CATIA, Creo, and Inventor, ensuring accurate and efficient production.
- Executed **FEA-driven validation** using ANSYS to identify potential failure points and optimize component durability.
- Applied **DFM/DFA principles** to reduce weight, minimize cost, and enhance manufacturability.
- Collaborated with cross-functional teams (R&D, manufacturing, quality) to ensure **first-time-right designs** that meet stringent quality standards.
- Ensured compliance with **global automation standards** and embraced Industry 4.0 practices to optimize manufacturing processes.

JK Fenner India Ltd

Quality & Product Design Engineer

2021 – 2022

- Played a pivotal role in supporting product design through advanced **3D modeling** and **simulation**, ensuring functional and manufacturable designs.
- Assisted in quality validation processes, which resulted in **reduced rework** and **improved product reliability**.
- Focused on **enhancing manufacturability** while adhering to industry compliance standards to ensure cost-effectiveness and performance.

Internships & Industrial Training

Bajaj Engineering & Skills Training (BEST), PES University

Mechatronics & Automation Trainee

Feb 2025 – Jul 2025

- Gained hands-on experience in **industrial automation**, **robotics**, **PLC programming**, **sensor integration**, and **Industry 4.0 technologies**.

Conceptia Konnect / Prime Tooling – CAD/FEA Trainee Intern

Feb 2025 – May 2025

- Specialized in **CAD modeling**, **FEA simulations**, and **design optimization** using SolidWorks.

Bharat Fritz Werner Ltd – Industrial Trainee

Oct 2023 – Nov 2023

- Practical exposure to CNC machining and manufacturing workflows.

Belathur Industries – Mechanical Intern

May 2023 – Jun 2023

- Worked on **CAD modeling**, **machining operations**, and **technical drawings** using CATIA V5.

Bosch Diesel Services – CFD Intern

Feb 2023 – Mar 2023

- Conducted fluid flow and thermal **simulations on diesel injection systems** using ANSYS Fluent.

Projects

Free Convection in a Trapezoidal Cavity with Porous Media

- Used FEM-based simulations to study **natural convection and heat transfer**.
- Analyzed **Rayleigh number**, **porosity**, and boundary conditions using MATLAB.
- Generated valuable insights for **thermal management** in industrial energy systems.

Modeling & Analysis of Vertical Axis Wind Turbine (VAWT)

- Designed and analyzed **Savonius and Darrieus-type VAWT blades**.
- Performed **FEA and aerodynamic analysis** using ANSYS, QBlade, CATIA, and SolidWorks.
- Proposed design modifications to improve **efficiency** and **structural safety**.

Education

B.E. in Mechanical Engineering

2022 – 2025

Bangalore Institute of Technology, Bengaluru — CGPA: 8.5

Diploma in Mechanical Engineering

2018 – 2021

Jawaharlal Nehru Polytechnic, Bidar — Percentage: 72%

Certifications

- CATIA V5, SolidWorks, ANSYS Workbench

Additional Information

Areas of Interest: Automotive Research and Development, Powertrain Systems Engineering, Heavy Machinery Design, Industrial Automation, Advanced Manufacturing, CAD/CAE-based Product Development.

Languages: English, Kannada, Hindi, Marathi