UDAY KUMAR

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

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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, (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 (R&D) company focused on automotive and automation systems, specializing in **Powertrain components**, product concept development, detailed design, and validation.
- Spearheaded the design and development of **Powertrain components**, significantly enhancing structural integrity, performance, and manufacturability,in line with ((IATF 16949))quality requirements.
- Delivered **100+ CAD models and assemblies**, reducing design iteration time by **25%**, improving manufacturability, and supporting first-time-right production using Siemens NX, CATIA V5, PTC Creo, and Autodesk Inventor.
- Executed **FEA-driven validation** using ANSYS to identify potential failure points and optimize component durability, ((ISO 26262) (Functional Safety) and (IEC 61508) principles).
- 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, (ISA-95, RAMI 4.0, OPC UA) optimize manufacturing.
- Ensured compliance with **global automotive & automation standards** (IATF 16949, ISO 9001, ISO 26262, IEC 61131), embraced Industry 4.0 ISA-95 (IEC 62264), RAMI 4.0, OPC UA (IEC 62541).

JK Fenner India Ltd

Quality & Product Design Engineer 2021 – 2022

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

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** for efficient energy generation at **low wind speeds**,FEA and aerodynamic analysis using **ANSYS, QBlade, CATIA**.
- Evaluated **self-starting capability, low noise operation, and omnidirectional wind capture**, making the design suitable for **urban and residential applications**.
- Validated results through **analytical calculations and ANSYS simulations**, showing close agreement and confirming **structural safety and performance**.

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 & Achievements

- CATIA V5, SolidWorks, ANSYS Workbench
- Awarded **Best CAD/CAE Student** in the Mechanical Engineering department for excellence in 3D modeling, simulation, and design optimization, Selected for a **Highest-level industry internship during the academic program**,

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