

Bhakti Kanade

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Third Year B.Tech Mechanical Engineering student with hands-on experience in 3D CAD modeling, 2D engineering drawings, prototype development, mechanical fabrication, testing, and manufacturing processes.

EDUCATION

MKSSS Cummins College of Engineering for Women, Pune | *B.Tech, Mechanical Engineering – CGPA: 7.55/10* 2024 – Present
Jawahar Navodaya Vidyalaya, Ahilyanagar | *Class 10, CBSE – 94.4%* 2020 – 2021
Jawahar Navodaya Vidyalaya, Ahilyanagar | *Class 12, CBSE – 77.8%* 2021 – 2023

TECHNICAL SKILLS

- **CAD:** Creo, SolidWorks, Catia v5, Fusion 360, AutoCAD
- **Engineering:** GD and T Fundamentals, Engineering Drawing Interpretation, Design Validation, Failure Analysis, Materials and Manufacturing Processes
- **Prototyping:** Resin 3D Printing, TIG Arc Welding, Raspberry Pi Sensor Integration, Prototype fabrication.
- **Automation & Electronics:** Raspberry Pi, Computer Vision, Sensor Integration, Solenoid Actuation

EXPERIENCE

Design Intern – Soudamini Instruments Jan 2026 – Jun 2026

- Modeled scaled 3 ft Plate Girder, Bowstring, and Through Girder bridges in CATIA V5 based on provided engineering drafts, then prepared 2D fabrication drawings in AutoCAD for CNC laser cutting.
- Calculated wheel-center distances, and bolster alignment for ICF and CASNUB bogie underframes prior to CAD drafting and fabrication.
- Integrated CNC laser cutting, resin 3D printing, UV post-curing, and surface puttying into a single production workflow. Gained hands-on experience with drilling machines and gear tapping threading machines during component manufacturing.

Research Intern – DRDO Associated Project at CCOEW Oct 2025 – Dec 2025

- Calculated orthographic projected surface areas using theoretical methods and validated results against SolidWorks Silhouette Entities and Section Properties, achieving 0.05% error.
- Analyzed failure modes and criticality of drone flight-control system components, including accelerometers, gyroscopes, and damping systems, signal distortion, and structural fatigue.

PROJECTS

DEF Management System – Caterpillar Tech Challenge '25, Top 10 Finalist Feb 2025 – Jun 2025

- Built a Raspberry Pi-based DEF analyzer using a Pi Camera and refractometer to measure urea concentration against the 32.5% reference concentration specified in ISO 22241-1.
- Integrated level sensors and solenoid-actuated mechanisms to route DEF into separate storage tanks based on concentration thresholds.
- Designed and fabricated an acrylic prototype tank using laser-cut components, assembling the sections with Araldite to achieve watertight sealing for DEF testing.
- Conducted iterative tests to determine the optimal refractometer and light-source positions within the prototype for accurate and consistent concentration measurements.

Core Member – Team Zenith (BAJA SAE) Oct 2024 – Aug 2025

- **Steering System Design:** Designed a rack-and-pinion steering system incorporating Ackermann geometry; performed steering effort and cornering force calculations for subsystem validation.
- **Fabrication & sponsorship:** Supported ATV dimension determination using failure theories and contributed to TIG welding and in-house chassis fabrication. Conducted factory visits and sponsorship campaigns across MIDC areas to secure components and resources for ATV development.

Low Temperature Superconductors – Engineering Materials Study July 2025 – Oct 2025

- Studied NbTi and Nb₃Sn, the primary low-temperature superconductors used for high-field magnet applications; compared their critical temperatures (9.2 K and 18.3 K) and material characteristics.
- Analyzed superconducting operation in the 1.9–4.2 K range, with NbTi widely used around 1.9 K for high-field applications such as the LHC.
- Examined the 27-km LHC magnet system, the role of superconducting magnets and cryogenic cooling in enabling the LHC to generate and maintain the high magnetic fields required for particle acceleration.

ACHIEVEMENTS

- **Top 10 National Finalist** – Caterpillar Tech Challenge 2025, among 1400 teams nationwide.
- **Runner-Up** – Taxiwars, Empulse 2025 | **Winner** – Game of Strokes painting, Gandhaar '26.

CERTIFICATIONS & INTERESTS

Certifications: Techfest, IIT Bombay – Automobile & EV Systems | SatGenesis, CCOEW – Rocket Propulsion & Aditya-L1.

Interests: Painting and hosting fine art workshops | Creative poetry writing.