Kanav Tayal

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ACADEMIC QUALIFICATIONS

Year	Degree/Certificate	Institute	CPI/%
2023-2027	B.Tech Mechanical Engineering	Punjab Engineering College	8.26/10
2022-2023	High School Diploma	DAV Public School	89.2%

WORK EXPERIENCE

- **Indian Institute of Technology, Roorkee** (*Roorkee, India*)
  Computational Fluid Dynamics (*Dec. 2024 - Jan. 2025*)
  CFD and Two-Phase Flow Analysis: CFD and Two-phase flow analysis| **Programming &Testing:** Open Foam & Basilisk.

ACADEMIC PROJECTS

- **Research Paper**:
  1. **Bubble Tracking in Confined Channels: Velocity Analysis in Hele-Shaw Cells** (*August'24 - Present*)
     - Analyzed fluid dynamics using OpenCV and ImageJ with 1000+ hours of research, achieving 95% accuracy in velocity calculations.
     - Improved velocity stability during Lagrangian approach implementation
     - **Technologies used:** OpenCV, Python, Matplotlib, NumPy
     - **Publications:** International Conference on Design and Manufacturing Technologies (ICDMT 2024), PEC Chandigarh.

  2. **Optimization of Machining Condition for Effective Turning of EN31 Alloy Steel** (*August'24 – March'25*)
     - Executed 81 experiments using Taguchi L27 orthogonal array design to analyze machining parameters (speed, feed, depth of cut) affecting surface finish.
     - Developed mathematical models via regression analysis achieving high predictive accuracy ($R^2 > 0.97$) for surface roughness under dry and wet conditions.
     - Identified optimal parameter combinations (A3B1C1) for improved surface finish during turning operations.
     - **Technologies used:** Taguchi Method, ANOVA, Mathematical Modeling, Surface Roughness Measurement (TSK SURFCOM-130A)
     - **Publications:** Presented at XXI National Conference on Emerging Technology Trends in Engineering & Project Competition (SPARK-2025), K.D.K. College of Engineering, Nagpur (March 2025)
- **Term Projects & Reports:**
  1. **V6 Engine CAD + Simulation** (***Self Project***)
     - Modeled a **200+ component** twin-turbo V6 engine in SolidWorks, including full valvetrain and forced induction systems.
     - Simulated realistic piston-crankshaft motion at 120° firing intervals with a 60° V-angle layout.
     - Performed comprehensive FEA including thermal, modal, and structural stress analysis on crankshaft and piston components.
  2. **eBAJA Team RPM** (***Team Project***)
     - Designed and built energy-efficient electric ATV with focus on powertrain optimization, battery management, and structural integrity.
     - Handled CAD modeling, suspension tuning, and drivetrain integration while ensuring SAE eBAJA regulation compliance
     - Collaborated with multidisciplinary team to optimize performance through systematic testing and iterative improvements.
  3. **EMI Power Transmitter** (***Self Project***)
     - Developed an EMI transmitter powered by two car batteries to wirelessly light multiple appliances, similar to a Tesla coil.
     - Designed a system minimizing power loss and eliminating electric discharge using a multi-coil network
     - Demonstrated potential for large-scale implementation to power entire communities wirelessly
  4. **Team Prometheus, PEC** (***Team Project***)
     - Led 15-member team in designing and fabricating human-powered rover for NASA's Human Exploration Rover Challenge (HERC).
     - Achieved 15% vehicle weight reduction through structural optimization while maintaining safety standards.
     - Conducted 50+ simulation tests using ANSYS and MATLAB to enhance overall vehicle performance.

CERTIFICATIONS

- CFD & Two-Phase Flow Analysis – IIT Roorkee (OpenFOAM & Basilisk) (*Dec''24*)
- Computational Fluid Dynamics – NPTEL (*Dec''24*)
- Heat Transfer – NPTEL (*May''25 - Jun''25*)

SKILLS

- **Area of Interest:** Flud Mechanics | Flow Analysis | Thermal Design |
- **CAD, Simulation and Analysis:** Ansys | SolidWorks | Open Foam | Basilisk | Fusion | ImageJ |
- **Languages:** Python
- **Data Analysis:** Microsoft Office (Excel, Word, PowerPoint) | Power BI

POSITIONS OF RESPONSIBILITY

- **Member:** (*Oct. 2023 – Present*)
  - Society of Automotive Engineers (Powertrain and Chassis Design)