Ayush Singh

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Education

- **Pandit Deendayal Energy University** Gandhinagar, India
  Bachelor of Technology in Mechanical Engineering Engineering, CPI: 9.92/10 (WES GPA: 3.98/4) *2023 - Present*

Skills

CFD (Python/MatLab, Ansys Fluent, OpenFOAM), FEA (Ansys Mechanical), CAD (SolidWorks, NX, Fusion 360), Welding (GTAW, GMAW, LASER, Ultrasonic, Friction, FSW, Resistance, Plasma, Gas), CNC Turning (Siemens), Advanced Manufacturing (EDM, WAAM, LPBF), MatLab, Model Rocketry, Programming & Full Stack Web Development, LaTeX

Experience

- **Core Technical Engineer & Treasurer - Apogee** June 2023 - Present (On-site)
  Systems Engineering at National Rocketry Team and Aerospace Society of PDEU
  - **Fuel Packing Efficiency**: Increased Rocket Motor KNSB Fuel Packing Efficiency by 50% by developing casting-based workflow
  - **Nozzle Design**: Improved Efficiency of Motor by 25% by designing De Laval CD Nozzle
  - **Sponsorship**: Raised Sponsorship of $3,600
- **Summer Research Intern (Report Link) - Indian Institute Of Technology Gandhinagar** May - July 2025 (On-site)
  Prof. Manish Kumar, IIT Gandhinagar
  - **CFD Simulation**: Simulated avalanche flow using VOF in Ansys Fluent; validated with experimental data (<5% error)
  - **Structural Testing**: Simulated 2 lattice structures; reduced impact force by up to 30%.

Projects

- **Optimized Structural Design of an Aircraft Wing Spar**: Optimized Traditional Wing Spars of Boeing 747-100 using FEA static and dynamic analysis for weight reduction.
- **Real Time Monitoring System for LPBF and GTAW**
  Dr. Ojas Satbhai, PDEU *2023 - 2025*
  - **Orthopedic Implants**: Novel approach to capture acoustic data for crack mitigation in Bio-compatible ZK60 alloy

Publications / Research Work

- **Property and Composition Dependence of hot cracking in LPBF for different materials**
  Prof. Vishvesh Badheka, PDEU - Under Review - IMECE, ASME
- **Predictive Analysis of Multi-Effect-Distillation System using ANN**
  Dr. Rahul Deharkar, PDEU - Under Review - ICAWTM-25 (Springer)
- **Additive Manufacturing of Batteries: Recent Trends and Challenges**
  Dr. Ojas Satbhai, PDEU - Under Review - ICTEA
- **High-Precision Launch Mount for Small Rockets Featuring Gear-Driven Angular Control**: Under Review
- **Aircraft Wing Spar comprising Honeycomb I-beam with supports**: Under Review

Achievements

- Merit Scholarship Recipient (100% Tuition Fee Waiver), PDEU, 2023-2025
- 1st Rank in Mechanical Engineering, 2023-2025
- Selected at Prestigeous Student Research Internship Program at IIT Gandhinagar, 2025
- 3rd Rank at Mech-A-Thon 2025, A 5-day Mechanical Hackathon, 2025
- Selected for 10-day Model Rocketry Workshop (55 students selected in India), Bengaluru (IN-SPACe, ISRO), 2024
- Invited Speaker at Additive Manufacturing Young Professional Seminar, 2024
- 3rd Winner in National COVID-19 Idea Challenge on 'AI & Robotics', VASCSC
- Top 200 students, National Children Innovation Festival - 2k19, GUSEC

Certifications

Metal 3D printing (Michigan), Launch Vehicle Analysis & Design (IIT Bombay), Essentials of Model Rocketry (IN-SPACe, ISRO), Java SE 8 Fundamentals (Oracle)

Leadership / Outreach

- Astronomy Outreach via Instagram: @atroyush: Created and actively manage a dedicated Instagram account for astronomy.
- Lawn Tennis Core Committee Member, 2024 - 2025
- Coordinated CFD (FDM) Python workshops at PDEU, training 100+ BTech, MTech, and PhD students
- Community Service at Rotary Club of Shantigram, May - June 2024
- Coordinated the 1st International Battery Symposium (ICTEA 2024) with McMaster, Toronto Met, Yalova Univ. & PDEU
- Founding President - SciKnowTech VIPNET Club, 2021 - 2023

Interests

- **Technical Interests**: Computational Fluid Dynamics, Welding, Additive Manufacturing, Astronomy, Model Rocketry and Aerospace
- **Personal Interests**: Fine Arts and Painting, Sports (Lawn Tennis, Karate)