

# Ayush Singh

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## EDUCATION

- Pandit Deendayal Energy University** Gandhinagar, India  
*Bachelor of Technology in Mechanical Engineering Engineering, CPI: 9.86/10 (WES GPA: 3.96/4)* 2023 - Present

## SKILLS

CFD (Python/MatLab, Ansys Fluent, OpenFOAM basics), 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, L<sup>A</sup>T<sub>E</sub>X

## EXPERIENCE

- Core Technical Engineer & Treasurer - Apogee** June 2023 - Present (On-site)  
*Founder & Technical Head at PDEU Rocketry Team (2025) and Aerospace Society of PDEU*
  - Competition:** Finalist in National Model Rocketry India competition, FRR approved, secured sponsorship of ₹3,00,000 (\$3,600)
  - Technical:** Systems engineer, worked specifically in propulsion, design & analysis
- Summer Research Intern (Report Link) - IIT 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 / RESEARCH WORK

- Novel approach to reduce pressure drop & increase heat transfer rate in TPMS-based heat exchangers**  
*Prof. Pavan Gurralla, PDEU*
- Optimized design of lattice-based structures to reduce avalanche impact by means of CFD modeling**  
*Prof. Manish Kumar, IIT Gandhinagar*
- Real Time Monitoring System for LPBF and GTAW Systems**  
*Dr. Ojas Satbhai, PDEU*  
Novel approach to capture acoustic data for crack mitigation in bio-compatible ZK60 alloy for orthopedic implants

## PUBLICATIONS

- Property and Composition Dependence of hot cracking in LPBF for different materials**  
*Prof. Vishvesh Badheka, PDEU - Published - IMECE 2025, ASME*
- Predictive Analysis of Multi-Effect-Distillation System using ANN**  
*Dr. Rahul Deharkar, PDEU - Accepted for publication - ICAWTM-25 (Springer)*
- Additive Manufacturing of Batteries: Recent Trends and Challenges**  
*Dr. Ojas Satbhai, PDEU - Under Review - ICTEA*

## ACHIEVEMENTS

- Bhalodia-Khetan Summer Research Excellence Award, ₹50,000 (\$570) prize, Summer Research Internship, IIT Gandhinagar
- Merit Scholarship Recipient (100% Tuition Fee Waiver - ₹1,20,000 (\$1,352) per semester), PDEU, 2023-2025
- 1st Rank in Mechanical Engineering, 2023-2025
- Selected at Prestigious Student Research Internship Program at IIT Gandhinagar, 2025
- 3rd Rank at Mech-A-Thon 2025, A 5-day Mechanical Hackathon, 2025
- 10-day Residential Model Rocketry Training (amongst 70 students from across India), Bengaluru (IN-SPACE, ISRO), 2024

## CERTIFICATIONS

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

## LEADERSHIP / EXTRACURRICULAR

- Astronomy Outreach via Instagram: @atroyush: Created and actively manage a dedicated Instagram account for astronomy.
- Lawn Tennis Secretary, PDEU, 2024 - 2026
- Coordinated CFD (FDM) Python workshops at PDEU, helped to train 100+ BTech, MTech, and PhD students
- Coordinated the 1st International Battery Symposium (ICTEA 2024) with McMaster, Toronto Met, Yalova Univ. & PDEU
- Founding President - SciKnowTech VIPNET Club, 2021 - 2023
- Active member of professional bodies: American Society of Mechanical Engineers (ASME), Indian Institute of Welding (IIW), Society of Automotive Engineers (SAE)

## INTERESTS

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

## REFERENCES

Prof. Manish Kumar (Research Guide & Student Dean, IIT Gn) - mkumar@iitgn.ac.in  
Prof. Pavan Gurralla (Research Guide, Associate Dean of School & Associate Professor, PDEU) - Pavan.Gurralla@sot.pdpu.ac.in  
Prof. Vishvesh Badheka (Research Guide, Former Dean of Academic Affairs, PDEU) - Vishvesh.Badheka@spt.pdpu.ac.in  
Dr. Anirudh Kulkarni (Faculty Mentor, CFD Guide & Asst. Professor, PDEU) - Anirudh.Kulkarni@sot.pdpu.ac.in