Thakur Pranav Gopal Singh

Passionate engineer contributing to innovation

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EDUCATION

Postgraduation	Duke University	Master of Science, Mechanical Engg & Material Science	2027	Present
Graduation	Manipal Institute of Technology	Bachelor of Technology, Mechanical Engineering	2024	3.56/4

EXPERIENCE

Balaji CNC Technologies (BCT Group), *Production & Operations Manager* | Hyderabad, India — Jan 2024 – Jul 2025

- Operated **CNC Milling, CNC Turning** with **Fanuc controllers,** and **EDM** machines to manufacture metallic parts for aircraft, helicopters, and UAV applications. Designed CAD models and programmed components using Mastercam software for 60+ components.
- Part of the implementation process of **AS9100 D** certification and audit by **IAQG**. Made sure reports are 100% in compliance with the manuals and standards for traceability. Developed **ERP** system for monitoring manufacturing cycles for further optimization.
- Conducted quality control analysis on the manufactured parts using **CMM, Profile projectors, 2D height masters**, and various precision instruments. Optimized production planning and job sequencing to minimize cycle time and setup time by 30%.

Defense Research & Development Laboratory, DRDL, DRDO, *Intern* | Hyderabad, India — Dec 2022 – Jan 2023

- Completed a short-term project on modeling a pressure regulator in **AMESIM**, gaining experience in design, machining, and achieving a precise pressure prediction of 20.48 bar against the experimental 21 bar. Witnessed its effective functioning during a static fire test.
- Conducted a research project on **micro-thruster thrust stands**, focusing on effective calibration methods using **MEMS** electromagnetic and electrostatic fins to identify the range of the possible micro thrust stand.

Balaji CNC Technologies (BCT Group), *Design & Production Engineer Intern* | Hyderabad, India — Jun 2022 – Jul 2022

- Gained proficiency in **Mastercam, SolidWorks, AutoCAD, and Arcocad** for CNC operations, managed the full production cycle from tendering to dispatch, developed 10 CAD models and programs, and conducted thorough quality control analysis according to **ISO** compliance.

PROJECTS

ThrustMIT(TMIT), a student rocketry team based in MIT Manipal working on building sounding rockets for the **Spaceport America Cup (SAC).**

Altair (Sounding rocket for SAC 2023), *Launch operations Lead, Payload & Structures Engineer* | TMIT, Karnataka, India — Aug 2022 – Aug 2023

- Designed and simulated the CAD models for the structure's aspect of the **sounding rocket** and **payload.** Built the same with the best aerospace-grade metals and composites involving in machine shop production activities reducing 40% lead times.
- Designed the **thrust-stand** for the **static fire motor tests** and motor, which successfully provided the desired neutral thrust-time curve and 3.6 s burn time. Led the launch operations team at the Spaceport liftoff site and participated in the **Space Dynamics Laboratory (SDL) challenge.**

Rayquaza (Sounding rocket for SAC 2022), *Payload & Structures Engineer* | TMIT, Karnataka, India — Aug 2021 – Aug 2022

- Designed a **spectroscopy** concept-based payload for a subscale rocket test and a **carbon-capture** concept payload using lithium hydroxide for the main scale launch. Researched on **air-brakes mechanism** to effectively delimit 3 and 10 km apogee using drag.
- Developed C.A.V.E. with carbon nano tubes (**CNT)** with **enhanced piezoelectric sensors**, proving its 30% effectiveness in damping ascent vibrations. The **modal analysis** and **subscale** launch proved the payload qualified the ascent induced vibration test and max 10 KN impulse.

Aircraft Pitch Control, *Control System coursework project under Prof Kevin Amith* | MIT Manipal, India — Oct 2023 – Nov 2023

- Designed a control system model for a **3-DOF aircraft pitch control** system in **MATLAB** to obtain the element stiffness matrix and global stiffness matrix, thereby obtaining the global $1*10^{-6}$ mm displacement for a 4800 N force for elements in respective directions.

Parallel Flow Radial Pin Fin Heat Exchanger, *Thermodynamics course project* | MIT Manipal, India — Apr 2023 – May 2023

- Analyzed the effectiveness of a parallel flow heat exchanger with **radial pin** and without pin in **ANSYS**. Designed and developed a heat exchanger, where the heat transfer coefficient went from 732 to 1532 w/m^{2}k demonstrating 60.7 % effectiveness.

RESEARCH PAPERS & PATENT

- [2310.19673] A Novel Non-Pyrotechnic Radial Deployment Mechanism for Payloads in Sounding Rockets
- Design and control of "STEWIE", a robotic payload stabilization mechanism for rocket flights.

  Filed a **patent** for the radial deployment mechanism in the Indian Patent Office **(Application No.: 202341075776)**

POSITIONS OF RESPONSIBILITY

Treasurer, *Lions Club International* | Hyderabad, India — Aug 2024 – Aug 2025

- Organizing awareness campaigns to reduce, reuse, and recycle for a sustainable environment. Set up blood donation camps & drives.

HRD & Escape Velocity Organizer, *Revels & Techtatva Fest* | Manipal Institute of Technology — Jul 2022 – Jul 2023

- Led HRD team to organize revels cultural fests **supervising events** and managing **logistics**. Conducted an **ORK simulation** workshop for Techtatva technical fest representing team escape velocity. Organizing beach cleaning drives and visiting especially abled children for festivals.

Host, *Webinars ThrustMIT* | Manipal Institute of Technology — Jul 2022 – Jul 2023

- Hosted online webinars with SKYROOT Aerospace and ABYOM Aerospace, discussing **start-ups** and advancements in rocketry.

ACCOMPLISHMENTS

- Ranked 10th out of 167 universities in SA Cup 2023.
- Ranked 50th out of 170 universities in SA Cup 2022.

SKILLS

CAD/CAM	Mastercam, CATIA, Fusion, SolidWorks	**Design**	Canva, MS Office, Latex
ANSYS	Structural, Modal, CFD	**Simulators**	MATLAB, AMESim, OpenRocket (ORK), Arcocad
Languages	Python, HTML, CSS, SQL	**Leadership**	Team Management, Public Speaking, Critical thinking

COURSES

Mechanical Design | FEM Analysis | CAD/CAM | Quality Control | Control System | Python, SQL, ML | Finance | Advanced Manufacturing Processes | Jet Propulsion and Rocket Technology | Lean Manufacturing | Machine Learning | Nano Tech & MEMS | Supply Chain