



## Pranav P R

Roll No.: ME21B1064

Bachelor of Technology

Mechanical Engineering

Indian Institute of Information Technology, D&M,  
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## EDUCATION

- Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram** Dec 2021 - Present  
B.Tech in Mechanical Engineering  
CGPA : 7.79
- Senthil Public School, Salem** June 2019 - July 2021  
Class 12th - Central Board of Secondary Education (CBSE)  
Percentage: 86.6%

## EXPERIENCE

- Indian Institute of Technology, Madras.** May 2024 - Present  
Research Intern  
Chennai
  - Conducted simulations of an inverted pendulum system using Python and MATLAB, by performing state space modeling, and solving differential equations.
  - Performed stability analysis of the system using Routh-Hurwitz stability criteria to ensure that the system remains stable under different conditions.
  - Developed and implemented a PID controller to stabilize the inverted pendulum, including tuning the proportional, integral, and derivative gains for optimal system performance.**Skills :** Solidworks . Fusion 360 . Matlab . Python . Simulink . Literature Review.
- Aerospace Division, Hindustan Aeronautics Limited.** Dec 2023 - Jan 2024  
Industrial Internship Trainee  
Bangalore
  - Got a Real-time Exposure in Realization of Parts for Rocket Structures like PSLV, GSLV MKII, MKIII.
  - Closely worked with Quality Control Manager (MKIII Dept) to inspect *Strap on base Shroud Structures, Nose-cone Adaptor of GSLV MKIII* as per the Engineering Drawings.
  - Documented the errors present in the workings and submitted as a *Snag* sheet to implement the process of rework.**Skills :** Quality Control . Engineering Drawing . AS9100D.
- IIITDM Kancheepuram, Chennai.** Aug 2023 - Dec 2023  
Research Intern  
Chennai
  - Investigated shock wave occurrence in supersonic nozzles under **Dr. Jayavel S's** guidance, contributing to the optimization of rocket nozzle systems by developing a 2D computational domain and performing CFD analysis to study shock wave effects.
  - Conducted grid independence tests and evaluated CFD simulations for various Nozzle Pressure Ratios (NPR), validating results with experimental data and proposing a second throat nozzle design to study its impact on flow separation in Converging-Diverging (CD) nozzles.
  - Scripted a Python program to solve compressible flow relations and prepared and presented a manuscript titled **"Effects of Second Throat in Converging-Diverging Supersonic Nozzle"** at the *ICFTES 2024* conference.**Skills :** Solidworks . Ansys Fluent . Ansys Workbench . ICEM CFD . Proptools(Python) . Origin pro . Literature Review
- Space Generation Advisory Council, Small Satellites Project Group.** March 2023 - Aug 2023  
Research Project Member  
Remote
  - Completed literature analysis on the effects of winds on small satellite observation and documented the findings.
  - Generated the mass and cost budgets for a 6U Cube-Sat and developed its CAD model, including conducting initial structural analysis.**Skills :** Literature review . Python . Solidworks . Ansys Workbench.
- Mars Rover Club (MaRS), IIITDM Kancheepuram, Chennai.** Aug 2022 - Aug 2023  
Mechanical Team Member  
Chennai
  - Designed the robotic gripper for manipulation tasks and wheels for the rover.
  - Assisted in completing the autonomous navigation Mars Rover fabrication and designed the rover's wheel CAD model using Generative Design in Fusion 360.
  - Collaborated with cross-functional teams to manufacture rover parts through various manufacturing processes.**Skills :** Solidworks . Fusion 360 . 3D Printing . Computer Aided Design(CAD) Modelling . Teamwork.

## PROJECTS

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### • CFD Analysis and Parameter Optimization of Convergent Divergent Nozzle

May 2023 - July 2023

#### CFD Analysis

- Computational study of a 2D CD supersonic nozzle with divergent angles of **5, 7, 10, 13, and 15 degrees** was performed.
- Found that a divergent angle of **15 deg** showed good performance with the absence of shock wave inside nozzle.
- Generated various contour and plot results (pressure, velocity, Mach number, temperature) for all six different cases.
- Simulated gases from liquid oxygen and liquid propane as the flow medium using CANTERA software for gas properties with Python scripting.

**Tools & technologies used:** Solidworks . Ansys Fluent . Ansys Workbench . ICEM CFD . Proptools(Python).

### • Acrylic Sheet Smartphone Stand

Aug 2022 - Sept 2022

#### Phone stand production

- Led a team of 5 members and manufactured **100+** Phone Stand using Acrylic Sheet for presenting as a Gift for Alumni as part of 6<sup>th</sup> Alumni meet and 10<sup>th</sup> Convocation.

**Tools & technologies used:** Autodesk AutoCAD, Laser - Beam Machining, Bending.

## TECHNICAL SKILLS AND INTERESTS

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**Languages:** Python, C, C++, Matlab.

**Developer Tools:** VS Code, Google Colab, Jupyter Notebook.

**Modelling Software:** AutoCAD, Fusion 360, Solidworks.

**Simulation Software:** Ansys Workbench, Ansys Fluent, Altair.

**Other Skills:** L<sup>A</sup>T<sub>E</sub>X

## POSITIONS OF RESPONSIBILITY

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### • Outreach Team Lead

July 2023 - June 2024

#### Alumni Affairs, IITDM Kancheepuram

Chennai

- Led a team of **3 members** for establishment of effective relationship between the Alumni Affairs Team and Institute's Alumni.
- Responsible for finalising **7 office bearers** for the Institute's Alumni Association and conducting Alumni Talks through out the semester.

**Skills :** Event planning . Communication . Team Management.

## CERTIFICATIONS

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- Matlab Onramp, Mathworks, Mathworks Academy.
- Simulink Onramp, Mathworks, Mathworks Academy.
- Metal Additive Manufacturing (Elite + Silver), IIT Kanpur, NPTEL.
- Introduction to Mechanical Engineering Design and Manufacturing with Fusion 360, Autodesk, Coursera.
- Explore Supply chain job simulation, GE Aerospace, Forage.

## ACHIEVEMENTS

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### • ACHIEVED Academy 2024

Mar 2024

#### Space Generation Advisory Council (SGAC)

Remote

- Selected as an ACHIEVED academy recipient. This provides me with an opportunity to learn courses/projects related to development of spacecraft missions.