

PRANAV D

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Summary: Mechanical grad passionate in the areas of *Bayesian Analysis, Human Body Modelling and Ergonomics*.

EDUCATION

Vellore Institute of Technology – Chennai Campus

Chennai, TN

Bachelor of Technology, Mechanical Engineering with spl. in E-Vehicles

(Exp.) May 2021 - Jun 2025

- CGPA: 9.42 (on a scale of 10) (*As of Apr 2025*)
- Consecutive four times Meritorious Award recipient: Rank 1 (*2025 & 2024*), Rank 3 (*2023 & 2022*)
- Cent Percent Attendance Award recipient (*2022*)
- Currently serving as Programme Representative and Student Council Member.

EXPERIENCE

VIT – Medical College of Wisconsin, US Joint Internship Program

Remote

Student Intern

Aug 2023 - Dec 2023

- Developing and implementing a *Smooth Particle Hydrodynamics (SPH)* model to accurately simulate spinal cord behaviour in the Cervical region and enable more precise medical interventions.
- Comparing and validating the results with primary output metrics like Segmental Rotation, Disc pressure, Ligament strain, etc.,

La Dassault Systèmes Foundation – India

Remote

Engineering DESIGN Internship Program

Aug 2023 - Aug 2024

- Completed a 3-phase campus internship programme focused on the project titled “*Converting ‘FE model of cervical spine’ to 3D Digital bio-twin*”.
- Combined the core concepts of Biomechanics, Finite Element Analysis and 3D Printing.

CORE COMPETENCIES

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|----------------------|---------------------------------|---------------------------|
| • Bayesian Analysis | • Data Prediction & Forecasting | • Computer Aided Design |
| • Data Visualization | • Spine Biomechanics | • Finite Element Analysis |

TOOLS & SOFTWARE

<i>Design</i>	<i>Analysis</i>	<i>Coding</i>	<i>Essentials</i>
<ul style="list-style-type: none">• Solidworks• Fusion 360	<ul style="list-style-type: none">• ANSA pre-processor• LS-DYNA• Hypermesh	<ul style="list-style-type: none">• Python• Git	<ul style="list-style-type: none">• MS-Office• Quarto• LaTeX

SELECTED PROJECTS

Comparison of Flexion-Extension Responses between Male and Female Cervical Spine Segments

- Extracted data from NHTSA online database using python APIs and performed Exploratory Data Analysis with interactive visualizations using *Holoviews* and *Bokeh* libraries.
- Modelled the segmental rotations of sub-axial cervical spine segments using *hierarchical Bayesian regression analysis*.
- The full conference paper is under peer review for the IRCOBi Europe Conference, 2025.

Analysis of Road Accident Fatalities in India using Bayesian approach

- Analysed the trends in traffic accidents and fatalities classified by road, vehicles and time of occurrence.
- Developed a *hierarchical Bayesian regression model* to forecast the fatalities count for future years.
- Under peer review as a short communication for IRCOBi Europe Conference, 2025.

Sensitivity analysis of a morphological finite element L3-L4 FSU

- Parameterized the L3-L4 FSU FE model for population study to simulate the anatomical variances using *ANSA, python and LS-Dyna*.
- Estimate the rotation angle from anatomical parameters using *Bayesian multiple linear regression*.
- The full conference paper was accepted for presentation at IRCOBI Asia Conference, 2025.

Computational Modelling of Li-ion Battery in LS-Dyna for crash applications

- Coupled mechanical, thermal and electrochemical solvers to simulate the impact and short-circuit scenarios of lithium-ion battery.
- Followed the Tshell elements with Randles equivalent circuit modelling approach.

Effect of Helmet Fit & Orientation in Frontal and Lateral Impact (*Work in Progress*)

- Studying the common misuse of bicycle helmets and analysing its effect on injury using finite element analysis.
- Identifying the most vulnerable orientation of the helmet using Bayesian analysis.

WORKSHOPS & CERTIFICATIONS

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| • An Introduction to Injury Assessment using Human Body Models (<i>CODE, IITM</i>) | (2D) Jan 2025 |
| • Introduction to Vehicle Occupant Safety (<i>CODE, IITM</i>) | (5D) Sep 2024 |
| • HyperWorks Introduction v2022 (<i>Altair Learning – Online</i>) | Jan 2023 |
| • Python 3.4.3 Training (<i>Spoken Tutorial Project, IITB</i>) | Feb 2022 |

VOLUNTEERING EXPERIENCE

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| • Nasha Mukht Bharat Abhiyan (<i>Anti-Drug Campaign</i>) by the Ministry of Social Justice and Empowerment, GoI. | Mar 2023 |
| • Unnat Bharat Abhiyan (<i>Rural Development</i>) by the Ministry of Education, GoI. | Feb 2023 |