

# PRANAV D

[dkp2611@gmail.com](mailto:dkp2611@gmail.com) · [Github](#) · [LinkedIn](#)

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

## EDUCATION

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<b>Vellore Institute of Technology – Chennai Campus</b> <i>Bachelor of Technology, Mechanical Engineering with spl. in E-Vehicles</i>	Chennai, TN (Exp.) May 2021 - Jun 2025
<ul style="list-style-type: none"><li>CGPA: 9.42 (on a scale of 10) (As of Apr 2025)</li><li>Consecutive four times Meritorious Award recipient: Rank 1 (2025 &amp; 2024), Rank 3 (2023 &amp; 2022)</li><li>Cent Percent Attendance Award recipient (2022)</li><li>Currently serving as Programme Representative and Student Council Member.</li></ul>	

## EXPERIENCE

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<b>VIT – Medical College of Wisconsin, US Joint Internship Program</b> <i>Student Intern</i>	Remote Aug 2023 - Dec 2023
<ul style="list-style-type: none"><li>Developing and implementing a <i>Smooth Particle Hydrodynamics (SPH)</i> model to accurately simulate spinal cord behaviour in the Cervical region and enable more precise medical interventions.</li><li>Comparing and validating the results with primary output metrics like Segmental Rotation, Disc pressure, Ligament strain, etc.,</li></ul>	

  

<b>La Dassault Systèmes Foundation – India</b> <i>Engineering DESIGN Internship Program</i>	Remote Aug 2023 - Aug 2024
<ul style="list-style-type: none"><li>Completed a 3-phase campus internship programme focused on the project titled “<i>Converting ‘FE model of cervical spine’ to 3D Digital bio-twin</i>”.</li><li>Combined the core concepts of Biomechanics, Finite Element Analysis and 3D Printing.</li></ul>	

## CORE COMPETENCIES

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

## TOOLS & SOFTWARE

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

## SELECTED PROJECTS

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<b>Comparison of Flexion-Extension Responses between Male and Female Cervical Spine Segments</b>	
<ul style="list-style-type: none"><li>Extracted data from NHTSA online database using python APIs and performed Exploratory Data Analysis with interactive visualizations using <i>Holoviews</i> and <i>Bokeh</i> libraries.</li><li>Modelled the segmental rotations of sub-axial cervical spine segments using <i>hierarchical Bayesian regression analysis</i>.</li><li>The full conference paper is under peer review for the IRCOBI Europe Conference, 2025.</li></ul>	

### **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 (*CODE, IITM*) (2D) Jan 2025
- Introduction to Vehicle Occupant Safety (*CODE, IITM*) (5D) Sep 2024
- HyperWorks Introduction v2022 (*Altair Learning – Online*) Jan 2023
- Python 3.4.3 Training (*Spoken Tutorial Project, IITB*) Feb 2022

## **VOLUNTEERING EXPERIENCE**

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- Nasha Mukt Bharat Abhiyan (*Anti-Drug Campaign*) by the Ministry of Social Justice and Empowerment, GoI. Mar 2023
- Unnat Bharat Abhiyan (*Rural Development*) by the Ministry of Education, GoI. Feb 2023