Arpit Mathur

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PERSONAL PROFILE

Mechanical Engineering undergraduate with a strong focus on Finite Element Analysis, Vehicle Dynamics modelling and simulations, and design optimization. Proficient in using advanced engineering tools such as Ansys Workbench, MATLAB, and Autodesk Fusion 360 to create innovative solutions. Experienced in designing, simulating, and prototyping components, with excellent problem-solving abilities and teamwork skills. Currently seeking research internships in the automotive industry to further expand my knowledge and practical experience.

RESEARCH INTERESTS

Applications of Finite Element Analysis; Automotive Engineering Design, Analysis and Optimization; Vehicle Dynamics Modelling and Simulations

WORK EXPERIENCE

School of Mechanical Engineering, Georgia Institute of Technology
Research Intern | Atlanta, United States of America | June 2024 – July 2024

- Conducted research under the guidance of Dr. Amit Jariwala, Director of Design & Innovation, School of Mechanical Engineering, Georgia Tech, focusing on generative design.
- Achieved a 58.5% reduction in brake pedal weight by utilizing Autodesk Fusion 360's Generative Design feature, resulting in a safer and stronger component compared to conventional designs.
- Ensured design feasibility by conducting finite element analysis (FEA) simulations in Ansys Mechanical, resulting in the identification and mitigation of potential failure points.
- Facilitated the fabrication of a brake pedal prototype through SLS 3D printing, resulting in the successful assessment of manufacturability and real-world application.
- Refined understanding of advanced engineering concepts by synthesizing literature on generative design and FEA methodologies, leading to more informed project decisions and enhanced research skills.

Team Srijan
Vehicle Dynamics Engineer | Ranchi, India | March 2023 – Present

- Developed an accurate tire model in MATLAB using the Magic Formula 6.2 and data from the Formula SAE Tire Test Consortium, enhancing the team's ability to predict tire behaviour under various conditions.
- Engineered new front and rear suspension systems in collaboration with teammates using Lotus Shark software, resulting in an optimized design for the next Formula Student Electric prototype.
- Contributed to the team's success in securing 29th rank in the electric category during the Rule Quiz at Formula Bharat 2024 (FS India).

Technical Intern | Ranchi, India | November 2022 – March 2023

- Gained hands-on experience with vehicle sub-systems like braking, suspension, steering, and drivetrain while working on Team Srijan's electric Formula Student prototype (Garud).
- Acquired essential workshop skills, including cutting and grinding, which are valuable for manufacturing and maintaining vehicle components.

EDUCATION

Bachelor of Technology in Mechanical Engineering

Birla Institute of Technology, Mesra | Ranchi, India | **CGPA: 9.02** | June 2021 - June 2025

Relevant Coursework: Automobile Engineering, Robotics Engineering, Finite Element Methods (FEM), Internal Combustion Engines (ICE) and Gas Turbines, Numerical Methods, Metallurgical and Materials Engineering

PROJECTS

Investigative Study on Effect of Different Orientations of Model in Smartphone Drop Test

December 2023 - January 2024

It was a parametric study conducted to analyse how various orientations of the model impact the maximum equivalent stress developed in Nothing Phone 1. In the study, while keeping all other variables constant, several values of drop height were employed for a particular orientation, and maximum equivalent stresses were determined using explicit analysis on Ansys Workbench. The relationship between these variables was established by plotting the collected data points.

SKILLS

Technical: Generative Design, Autodesk Fusion 360, CAD, SolidWorks, Finite Element Analysis, Ansys Workbench, MATLAB, Simulink, Rapid Prototyping, 3D Printing Technologies (SLS, FDM), Vehicle Dynamics, GD&T

Soft: Creativity, Problem-Solving, Critical Thinking, Adaptability, Teamwork

Languages: English (Fluent), Hindi (Native), French (Basic)

TEST SCORES

Graduate Record Examinations (GRE) General Test | ETS | December 2023

Quantitative: 165 | Verbal: 155 | Analytical Writing: 3

ADDITIONAL COURSES

Detailed Introduction to Ansys Workbench

Udemy | August 2023 – December 2023

This was an intensive online course offered by Udemy and instructed by Orville Academy Plus. The course was structured in such a way that one would start learning from the basics of performing analysis on Ansys Workbench and progressively make their way up to performing complex industry and research-relevant analyses independently. After completing this course which was filled with simple and practical examples, I gained valuable insights and knowledge about various analyses such as linear and non-linear static structural analysis, steady state and transient thermal analysis, modal analysis, buckling analysis, and dynamic analysis. Additionally, it introduced me to the theory of design optimization and taught me topology optimization using Ansys Workbench.

EXTRACURRICULAR EXPERIENCE

Rotaract Club of BIT Mesra

Member | Ranchi, India | February 2022 – February 2024

Helped the club organize numerous successful and entertaining events like BIT Roadies and Gokulashtami Celebration, which increased the footfall of the club's events by over 10%.