MAULIK RAKESH RAJPUT

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BACKGROUND

Passionate and driven Mechanical Engineer with hands-on experience in Mechanical and Structural Design, Composites, CAE, Vehicle Dynamics, and Simulation. Strong interest in the automotive and motorsport industries, with a focus on structural optimization and performance-driven design. Eager to contribute to innovative and sustainable vehicle development while continuously expanding technical expertise.

EDUCATION

MSc. in Mobility Engineering (Automotive) *Aug 2023 - July 2025*
Chalmers University of Technology, Sweden

- Relevant Coursework: Vehicle Motion Engineering, Road Vehicle Aerodynamics, Engineering Design and Optimization, Fluid-Structure Interaction, Automotive Engineering Project etc.

B.Tech in Mechanical Engineering *Jul 2019 - Jun 2023*
SVKM's Dwarkadas Sanghvi College of Engineering, India

- Relevant Coursework: Machine Design, FEA, Material Technology, Manufacturing Processes, CAD CAM and CAE, Strength of Materials, Automobile Engineering, Motorsports Engineering etc.

ACADEMIC PROJECTS & RESEARCH

INVESTIGATION OF BUSBAR FIXATION FOR COMMERCIAL EV's PDU - VOLVO TRUCKS *Gothenburg, Sweden*
Master's Thesis *Report Link* *Jan 2025 – June 2025*

- Developed innovative solution for electrical isolation and robust fixation of high-voltage busbars in Power Distribution Units for next-gen Volvo electric trucks, following a structured product development methodology.
- Designed multiple concepts in PTC Creo, structurally tested them in ANSYS, and evaluated alternatives using morphological & multi-criteria decision matrices considering, manufacturability, and serviceability requirements.

CHALMERS FORMULA STUDENT *Gothenburg, Sweden*
Project Engineer - Chassis *Sept 2023 – Sept 2024*

- Fabricated a lightweight, rules-compliant monocoque using carbon fiber sandwich composites for a Formula Student car in collaboration with interdisciplinary subgroups.
- Designed and developed the roll hoops, frontal crash structure, and a LiDAR mounting system using Siemens NX and ANSYS, ensuring safe and functional integration into the chassis and regulatory compliance in FS competitions.
- Achieved 1st place in Dynamic events (Driverless Class) and 3rd Overall in the Driverless Cup at FS East; secured 2nd Overall in the Driverless Cup at FS Germany, competing against 80+ international teams.

DJS MILES - SHELL ECO MARATHON *Mumbai, India*
Vice-Captain and Mechanical Engineer *Feb 2020 – Nov 2022*

- Engineered a CFRP monocoque chassis and steering system for a supermileage EV, focusing on vehicle dynamics, solid mechanics, composite design and aerodynamics using Fusion 360, ANSYS ACP and Fluent.
- Recognized and won following accolades: 1st in Vehicle Design Award, 1st in Adobe Digital Literacy Award globally, 2nd in Future Rider Challenge, 2nd in Pitch the Future Challenge, in the Asia Pacific and Middle East region.

AUTOMOTIVE ENGINEERING PROJECT *Gothenburg, Sweden*
Master's Course Project *Report Link* *Aug 2024 – Jan 2025*

- Simulated cost and energy performance of EV and ICE heavy vehicles over freight routes using a forward simulation framework in MATLAB/Simulink, revealing 20% higher energy costs for ICE powertrains.
- Developed a Driver model to strategize appropriate driving behavior based on environmental inputs provided by stakeholders (Volvo GTT and ReVeRe) in coordination with the vehicle model.

FLUID-STRUCTURE INTERACTION ANALYSIS ON THE REAR WING OF A FS CAR *Gothenburg, Sweden*
Master's Course Project *Nov 2024 – Jan 2025*

- Conducted one-way FSI simulation of a composite carbon fiber rear wing of a formula student using STAR-CCM+, ANSYS Fluent, ACP, and Mechanical, analyzing pressure differences, structural deformation, and flap angle optimization across various angles of attack.
- Achieved 954 N of downforce (only rear wing) at 100 km/h with only 20% of allowable deformation, confirming the wing's performance, safety, and rule compliance under race conditions.

PROFESSIONAL EXPERIENCE

VOLVO GTT *Gothenburg, Sweden*
Summer Intern *Jun 2024 – Aug 2024*

- Modeled and implemented the kinematic model for an A-double combination of heavy vehicles.
- Developed and integrated a real-time logic for estimating the position and slope of each trailing unit relative to the lead truck using MATLAB & Simulink.
- Conducted comprehensive data visualization, including real-time articulation angle estimation for system validation.

CHALMERS UNIVERSITY OF TECHNOLOGY *Gothenburg, Sweden*
Teaching Assistant and Lab Instructor *Nov 2024 – Jan 2025*

- Facilitated lab sessions for Vehicle Motion Engineering (MMF062) and Road Vehicle Aerodynamics (MTF236) using Chalmers' full-scale driving simulator (CASTER).
- Guided students in Simulink model validation, covering steering dynamics, slip calculations, brake bias, and steady-state cornering behavior.
- Led hands-on sessions demonstrating aerodynamic effects on vehicle performance by comparing simulator results with and without aero packages.

PATENTS & PUBLICATIONS

Patent Pending - Pre-Manufactured insulating insert for HV PDU (Volvo Trucks) May 2025

Co-Designer, Under Review by: European Patent Office.

Designed a concept insert to secure high-voltage components within conductive enclosure assemblies, ensuring electrical insulation and high mechanical strength.

Design Registration – Monocoque Chassis of an Electric Vehicle March 2023

Co-Designer, Issued by: The Patent Office, Government of India.

Developed a carbon fiber–PETG sandwich composite monocoque for an Electric Supermileage Vehicle (Prototype Class), focused on drag reduction and lightweight construction to enhance energy efficiency. 391128-001

Design Registration – Upright for Electric Vehicle Feb 2023

Co-Designer, Issued by: The Patent Office, Government of India.

Designed a lightweight upright for an Electric Supermileage Vehicle (Prototype Class), aimed at reducing the overall weight of the steering system. 379459-001

TECHNICAL COMPETENCIES

CAD Tools: SolidWorks, Siemens NX, PTC Creo, CATIA, Fusion 360, AutoCAD & Inventor.

CAE and Simulation: ANSYS (Mechanical, Fluent, ACP, Structural Optimization, ADPL, Explicit Dynamics, Discovery Live), Simulink, STAR-CCM+, SimScale, Altair Inspire & IPG CarMaker.

Programming and Scripting: MATLAB & Python.

Application Software: MS Office Suite, Blender, Illustrator, Photoshop, & After Effects.