

Qualifications Summary

Detail-oriented individual with background in CAE, NVH engineering, dedicated to providing innovative engineering solutions for project success and organisational growth.

Core Competencies

- **CAE Engineering:** Expertise in CAE engineering and crash analysis techniques for safety of vehicles, particularly within the automotive sector.
- **NVH Engineering:** Expertise in NVH measurement and analysis techniques, particularly within the automotive sector.
- **Simulation Modelling:** Skilled in developing simulation models using CFD tool ANSYS Fluent and executing aerodynamic simulations to validate designs and enhance product performance.
- **Finite Element Analysis (FEA):** Conduct FEA to assess structural integrity, thermal behavior, and vibration characteristics using tools like LS-Dyna.
- **Collaboration:** Effective in collaborating with diverse teams to deliver innovative projects within established timelines.

Career Highlights

Front-End Developer

February 2024 - Current

Freelancing

- Developed front-end web pages using HTML, CSS, JS.
- Created responsive designs ensuring compatibility across various devices and browsers.
- Implemented interactive features to enhance user experience.
- Live websites:
 - <https://maruthiporfolio.com/>

Oxford Brookes University, UK

Sep 2022 – Sep 2023

Student, Masters in Automotive Engineering with Electric Vehicles

Acquired in-depth knowledge of BMS, electric vehicle design, and advanced powertrains. Increased understanding of vehicle dynamics, crash impact, and NVH (Noise, Vibration, and Harness). Collaborated with fellows to complete class assignments and accomplish tasks within set time.

Assignments:

- **Advanced Vehicle Dynamics:** Optimised vehicle stability through derivative analysis and ADAMS simulations, achieving enhanced ride comfort and stability with damping ratio of 0.5.
- **Efficiency Gains & Emission Reductions with GT-Suite:** Enhanced fuel economy by 7.69% and decreased emissions by 12% in hybrid powertrains through comprehensive drive cycle analysis and GT-Power validation using GT-Suite.

Simulations Lab India, Hyderabad

June 2022 – July 2022

CAE Engineer

- Designed an aerofoil wing and simulated its performance in a virtual wind tunnel using CFD tool ANSYS Fluent, achieving a 20% improvement in aerodynamic performance.
- Maximised accuracy and efficiency by validating performance improvements in collaboration with team of 15.

Application Development Associate

Sep 2021 – June 2022

Accenture Solutions, India

- Tested backend functionality for displaying merchant offers on a bank application and performed test validations.
- Conducted automation, functional, and regression testing across 50+ test cases using Tricentis Tosca and Selenium, identifying and resolving over 100 bugs to improve application stability.

Tata Technologies, Hyderabad

Feb 2019

PLM Trainee

- Gained expertise in all aspects of automotive lifecycle management from inception to disposal.
- Boosted efficiency by 15% by mastering PTC Windchill and 3D Experience (Enovia) and enhancing Bill of Materials (BOM) and lifecycle management procedures.

Key Projects

NVH Acoustic Analysis on Audi A3

- Designed Audi A3 cabin in SolidWorks, optimized mesh size (0.2 m to 0.05 m), achieving accurate non-zero frequency modes.
- Reduced structure-borne sound frequencies (87.6Hz to 67.936Hz) using absorber materials.

Crashworthiness of EV battery module

- Designed a crashworthy battery in SolidWorks, conducted load and laminate analysis achieving a light weight battery tray replica (110kg).
- Used spring dampers and appropriate boundary conditions in simulations, ensuring the battery module withstood impact velocities of 13.86 mm/ms without significant deformation.
- Developed crashworthy battery enclosures for EVs, reducing side impact deflection from 256.94 mm to 9.356 mm and front impact deflection from 231.94 mm to 6.356 mm through LS-Dyna simulations.

Composite Bone Fracture Fixation Plate

- Decreased plate thickness by 4mm and elevated patient comfort by creating 3D models of fracture bone fixation plates and screws in SolidWorks.
- Achieved 13% reduction in predicted bone plate failure rates and improved bone healing via finite element analysis.
- Executed stress-strain distribution analysis using ANSYS under various loading conditions (up to 10 m/s) to simulate real-world impact scenarios.

NVH Absorber Design

- Designed tuned vibration absorber for a beam, achieving target frequency (76 Hz) and reducing flexural vibrations.
- Optimized absorber mass position for 76.067 Hz resonance, improving vibration suppression by over 85%.

Design & Fabrication of Formula 3 Racing Car

- Directed team of four in establishing and optimising powertrain system for SAE Supra car.
- Utilised custom-mounted 2015 Honda CBR 150R bike engine, developed fuel and coolant systems through Creo, and performed thermal analysis with ANSYS.
- Maintained maximum speed of 105 km/h and raised power efficiency by 15% through real-world testing.

Education

Masters in Automotive Engineering with Electric Vehicles

Oxford Brookes University, UK

Sep 2022 – Sep 2023

Bachelors in Mechanical Engineering

MLR Institute of Technology, Hyderabad, IN

July 2017 – May 2021

Certifications

MATLAB on-ramp, MATLAB Academy (MathWorks), 2024

Simulink on-ramp, MATLAB Academy (MathWorks), 2024

CFD Through Centrifugal Pump, CFM - Airflow Around a Spoiler, Coursera, 2024

SolidWorks, CADD Craft Solutions, 2022

Accomplishments

- Created personal portfolio website (<https://maruthiporfolio.com/>) and integrated AI chatbot by leveraging HTML, CSS, and JavaScript.
- Enhanced user interaction and automation capabilities by designing personal AI voice assistant with Python for personal computer.

Technical Proficiencies

ANSYS, NVH Analysis, GT-Suite, CAE, LS-Dyna, MATLAB, Simulink, SolidWorks, GD&T, Python, Ansys Fluent