Prajit Bhadauria — 2024

Engineering Portfolio

ABOUT ME

I’m a highly motivated and aspiring engineer with a master’s focus on Automotive and Mobility Systems Engineering, rooted in a rich educational background and an intense curiosity for research and development. My academic path has always been aligned with pushing the boundaries of mechanical engineering and design.

My passion lies in bringing design ideas to life through the power of mechanical engineering principles. I'm equally driven by research and development, and I thrive in environments that allow me to combine hands-on work with theoretical exploration.

At the core, my inclination towards CAD, mechanical engineering, and hands-on R&D defines my drive to innovate. I'm fascinated by the intricate process of transforming concepts into functional components, considering every aspect from technical parameters to design rules and manufacturing feasibility.

Contact Me:
(313)632-1498 | LinkedIn | Email

WHAT I BRING TO THE TABLE

01

- **Technical Expertise:** Proficient in 3D modeling with Solidworks, Fusion 360, and other industry-standard software. Possess strong analytical skills honed through experience with FEA tools like Ansys and Abaqus.

02

- **Research & Development Aficionado:** Actively seek opportunities to delve into new technologies and contribute to cutting-edge projects. My experience includes research on engines, propulsion systems, and advanced chassis design.

03

- **Software Savvy:** Possess a strong foundation in multiple CAD software, MATLAB, programming languages like Python and expertise in various automotive diagnostic and testing tools.

04

- **Lifelong Learner:** Continuously expand my knowledge base through online courses, certifications, and hands-on training programs. Through my hands-on approach and dedication to design engineering, I strive to translate designs into reality.

AND MORE…. As I continuously contribute to innovative and thought-provoking solutions to the ever-evolving automotive industry, leveraging my skills and experiences to engineer the future of mobility.

EDUCATION & EXPERIENCE

2018-2022

Bachelors Degree

Delhi Technological University, INDIA

Bachelors of Technology
in
Mechanical engineering with specialisation in automotive engineering

3.3 GPA

2021

CAD Modeller

Richedu, Canada
Remote - Internship

3D Modelled a one of its kind companion robot that would help specially-abled students and make the campus a more inclusive space.

2021

Design engineer

Mazout Electric Internship

Designed and manufactured first in class long range electric-powered cruiser bike, successfully developed, and tested the first physical prototype.

EDUCATION & EXPERIENCE

DEARBORN

2022-2024

Masters Degree

University of Michigan – Dearborn, USA

Masters of Science in Engineering
in
Automotive and Mobility Systems Engineering with concentration in Design and Manufacturing

3.66 GPA

2023

Systems Engineer

Stoneridge, Inc NA Internship

Led innovation and standardization across 3 product lines. Documented requirements, specs, and testing for intelligent, safe, and efficient vehicles. Supported quality assurance through fault analysis and adherence to engineering standards.

FEV

2023-2024

Engine and Hybrid Powertrain Development Engineer

FEV, Inc NA Internship

Managed powertrain test setups for commercial engine performance & emissions certifications. Skilled in INCA, Uniplot, Topexpert & dynamometers testing for precise data acquisition. Led creation of new engine mapping, optimizing ECU & DCU calibrations for emission compliance.

RESEARCH EXPERIENCE

- **Design, Analysis, and Optimization of an ATV Spaceframe Chassis**
  Delhi Technological University, Delhi, India

  • Designed and validated (static, torsional, and modal FEA) of SAE BAJA ATV chassis to find out drawbacks in the base design. Performance of the chassis was significantly enhanced by rectifying design flaws by strategically adding structural reinforcement, with up to 50% decrease in deformation in certain vehicle body sections.

- **Availability and Maintainability Analysis of Delhi Transport Corporation Bus Fleet**
  Delhi Technological University, Delhi, India

  • Gathered and computed data from one of the major government bus depots in Delhi (2 years' worth of data and over 50 buses) and formulated ways to optimize bus maintenance procedures and reduce their downtime as it was observed that maintainability was being compromised for availability.

ACADEMIC PROJECTS

- **Complete end-to-end systems engineering modelling of 2028 VW Taos Electric Vehicle**
  Vehicle benchmarking, QFD analysis, Interface diagrams, Decomposition tree for the subsystems and Technology and Business plan were all created in detail.
- **Homogeneous Charge Compression Ignition Engine**
  Study and analysis of SPCCI, HCCI and RCCI engine technologies. Investigated its potential use to bridge technological gap between combustion engine and green technology powered vehicles.
- **Liquid Piston Rotary Engine Technology**
  Benchmarked and analyzed Wankel and Liquid Piston rotary engines on power and torque output as well as fuel usage. Researched engine cycle, parts, operation and benefits of the reinvented rotary engine by Liquid Piston.
- **Non-conventional Energy Powered Vehicle Systems**
  Studied innovative green propulsion systems for vehicles. Researched alternative fuels used presently, i.e., low carbon fuels, biodiesel, natural gas, electricity and their usage in current vehicles and infrastructure.
- **Socio-economic Impact of Electrical Vehicle Sales and Incentive Policies**
  Research and analyzed data regarding electric vehicle sales in the Indian scenario and the socio-economic impact due to fiscal and other incentives as part of EV policy frameworks around the world and India

SKILLS & CERTIFICATIONS

Programming : Python, C++, MATLAB

Software Package : Microsoft Office, Solidworks, Ansys, Fusion 360, Autodesk Alias, Catia, Siemens NX, Abaqus, LS Dyna, AutoCAD, Creo, Scilab, CAN/LIN monitoring, Vector tools(CANoe, CANape), ATI tools(Vision), MORPHEE, ADAPT, VehicleSpy, Uniplot, Topexpert, ETAS INCA

Tools/Technologies : CAD, CAE, FEA, Product design, Engineering Design, Design to manufacture, Rendering, HIL testing, ECU/DCU Calibration

Coursera Certifications-

- 3D Printing Software by University of Illinois
- Introduction to Mechanical Engineering Design and Manufacturing with Fusion 360 by Autodesk
- Introduction to Petroleum Engineering by Tomsk Polytechnic University
- Introduction to Self-Driving Cars by University of Toronto

Motorsports Engineering - Undertook on-track pit-engineer training by Prudent Motorsports; worked on optimizing the suspension geometries, tire pressure, and temperature and analyzed data logs from the onboard data acquisition systems on the superstock race car and were able to decrease the lap timing by 30 seconds

Car Designing - Received online certificate in Car Designing training course by Autodesk; modelled the entire body-shell of a Tesla model 3

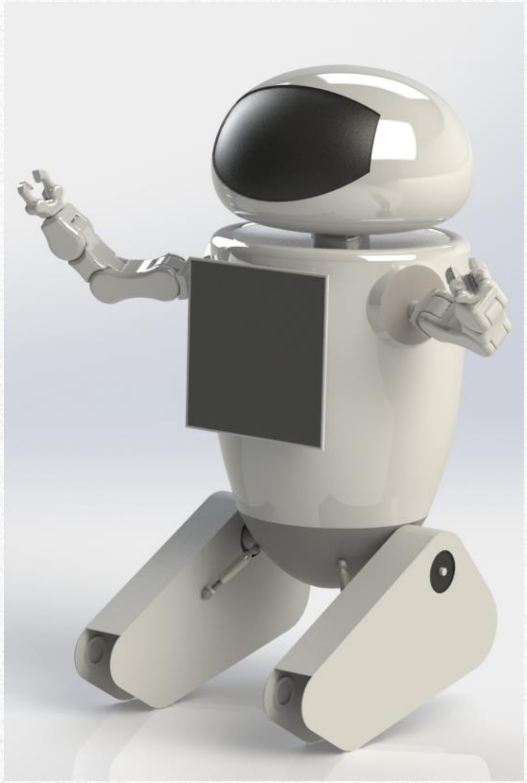
Commercial Vehicle Engineer - Attended Advance Automobile System Familiarization of Commercial Vehicles Training by Ashok Leyland, India

UDEMY Certification - Master Solidworks 2018 - 3D CAD using real-world examples

DESIGN & ANALYSIS

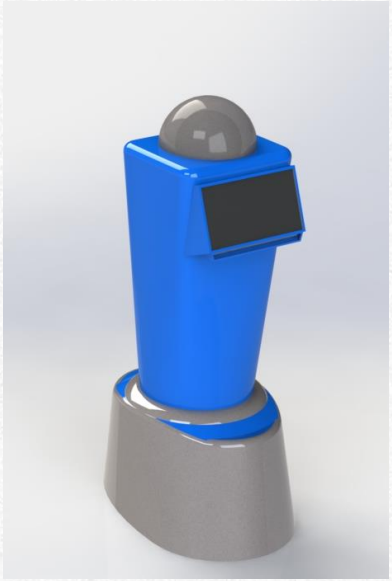
Richedu- CAD Modeler

Worked as a 3D CAD Modeler on a one of its kind university companion robots that would help students with special needs and make the campus a more inclusive space. Completely developed the CAD body structure in 4 months' time. Suggested improved and innovative technologies for the propulsion of the robot and assisted with environment recognition systems.



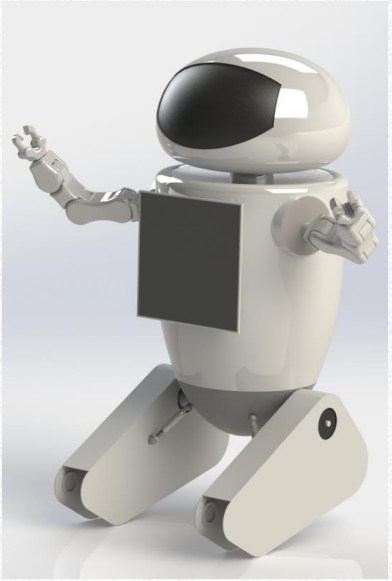
DESIGN & ANALYSIS

Richedu- CAD Modeler – EVA Generations



GEN 1

GEN 2

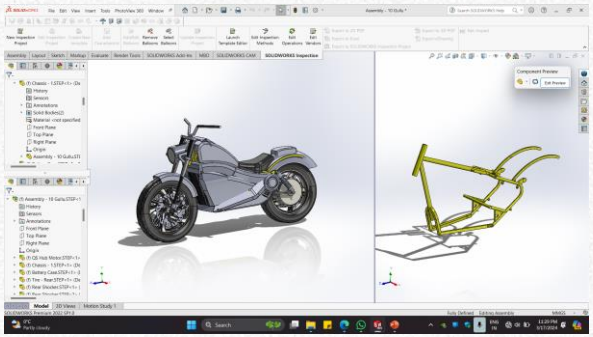


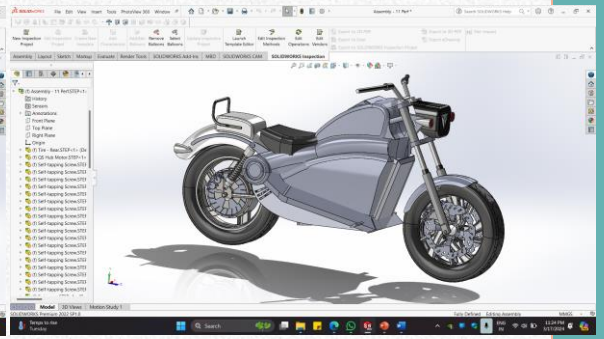
GEN 3

DESIGN & ANALYSIS

Mazout Electric- Design Engineer

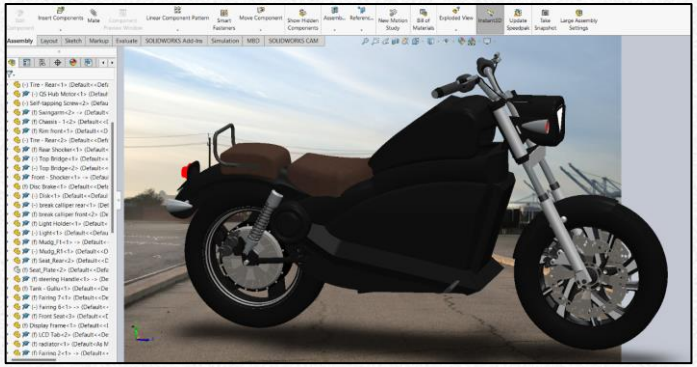
Designed and manufactured the first prototype of the electric cruiser bike, showcasing strong expertise in design engineering. Innovated new ideas and solutions, showcasing active engagement, excellent grasping power, and a creative mindset. Demonstrated mastery over overall design aspects and successfully oversaw the manufacturing steps involved. First Physical Prototype, achieved a significant range of 300 km (150% increase over industry average).





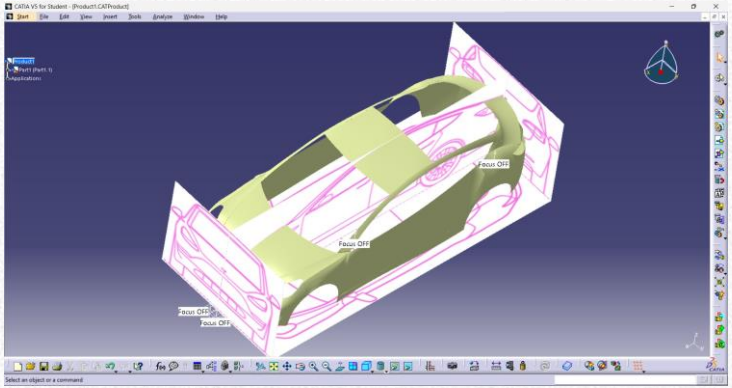
DESIGN & ANALYSIS

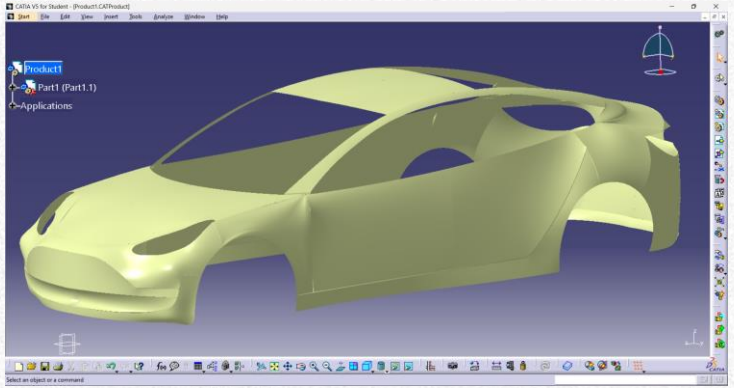
Mazout Electric- Design Engineer

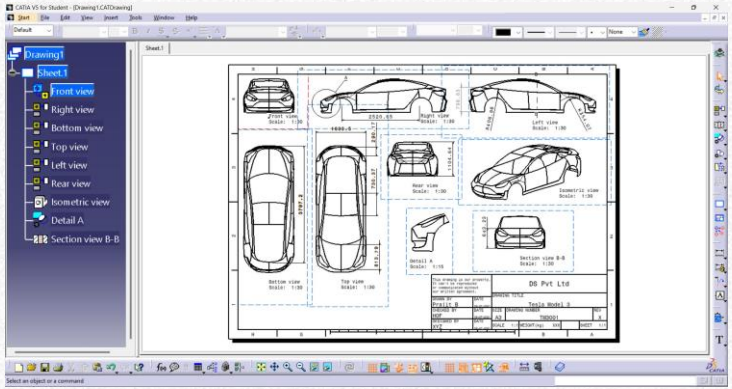


DESIGN & ANALYSIS

CATIA TESLA MODELING - Complete Surface modeling of a Tesla 3







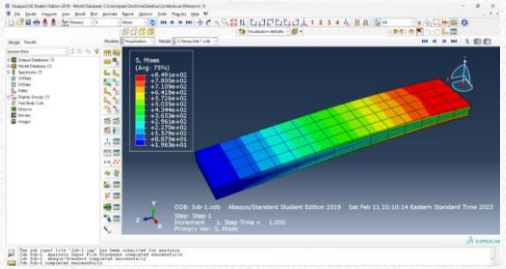
DESIGN & ANALYSIS

Master's Course in FEM of Automotive Structures

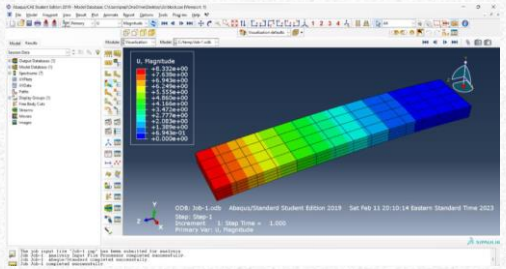
- Design and Assembly
- Material selection and property definition
- Load and Boundary Conditions
- Simulation
- Stress and Deformation analysis

All projects covered in ABAQUS

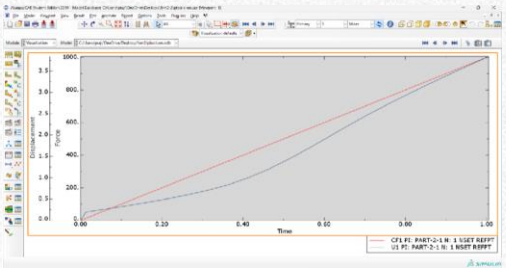
Project 1- Stress and Strain analysis of 3-D metal strip



Stress Distribution



Strain Distribution

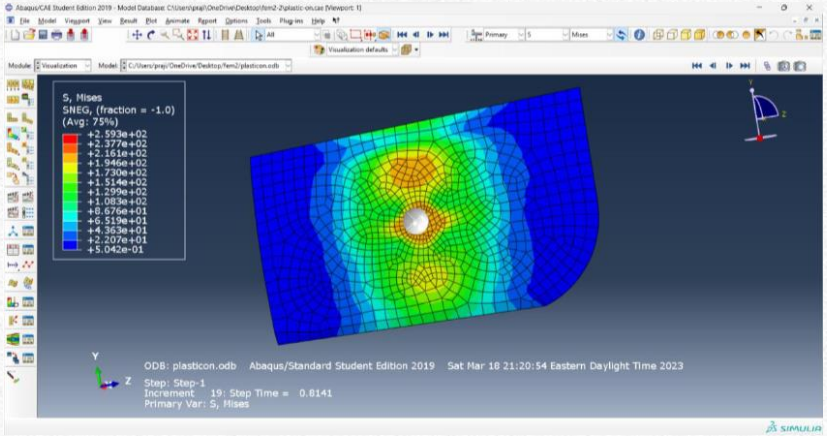


Stress-Strain with Time

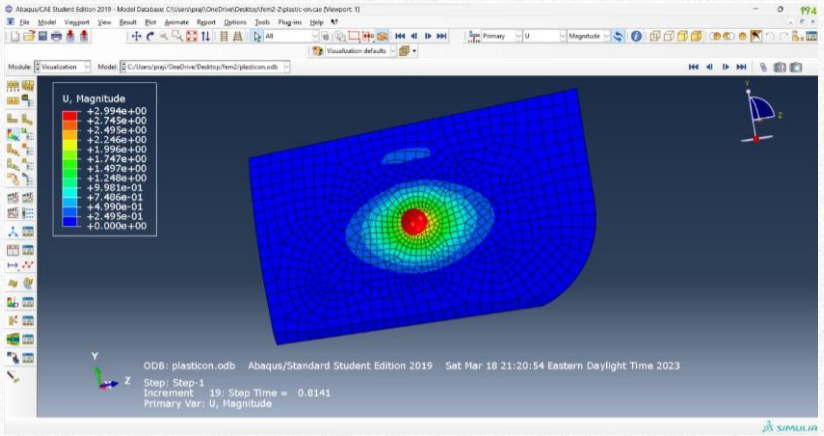
DESIGN & ANALYSIS

Master's Course in FEM of Automotive Structures

Project 2- Stress and Strain analysis of Metal door with impact from non-deformable sphere



Stress Distribution



Strain Distribution

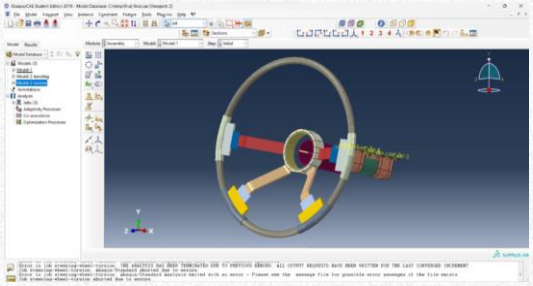
Project was used to introduce nonlinear geometry strain analysis for deformation at high stress values.

DESIGN & ANALYSIS

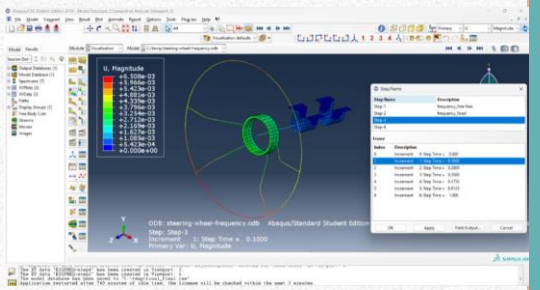
Master's Course in FEM of Automotive Structures

Project 3- Stress and Modal analysis of a car steering wheel

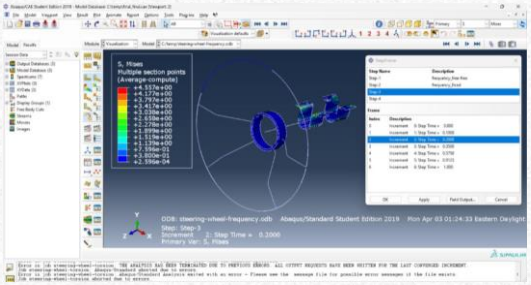
Simulated vertical, horizontal and torsional forces for static analysis as well as harmonic vibrations and deformations for modal analysis



Base assembly



Strain Distribution

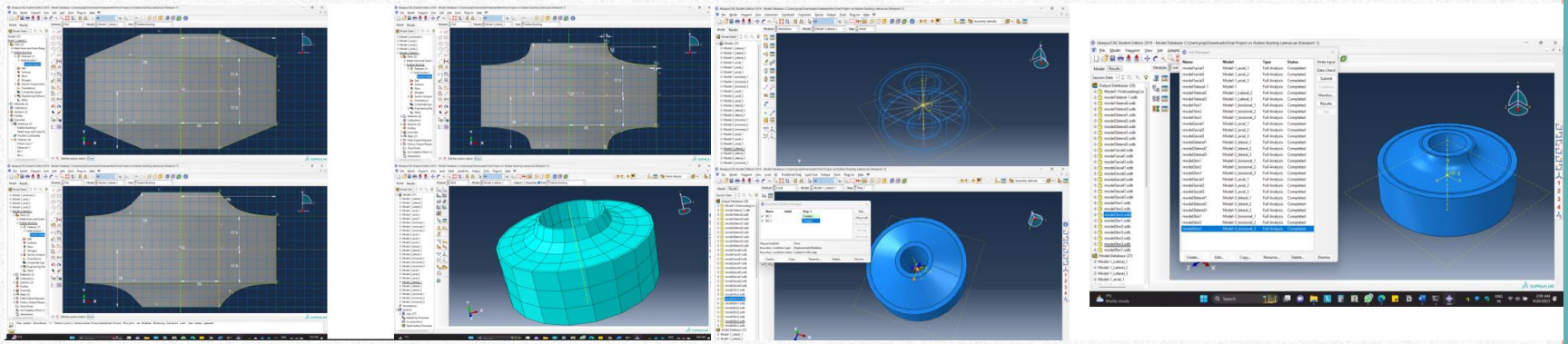


Stress Distribution

DESIGN & ANALYSIS

Master's Course in FEM of Automotive Structures

Final Project- Stress and Strain analysis of Damping Rubber Bearing and development of new improved design



Base Design- top left with updates designs bottom left and top right and meshed design on bottom right

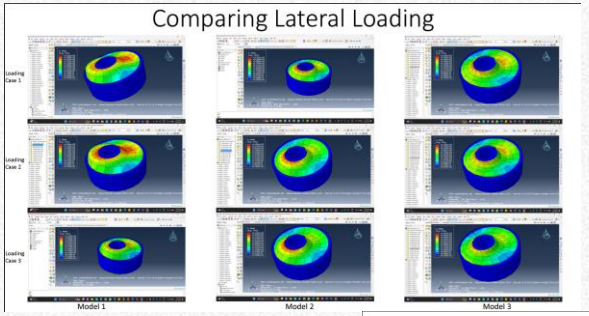
Loading and Boundary conditions on updated design

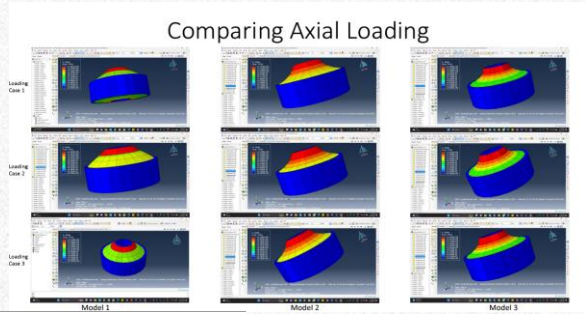
Project was used to introduce Design optimization and Rubber/Plastic (Visco-elastic and Hyper-elastic) Mechanics through stress-strain analysis

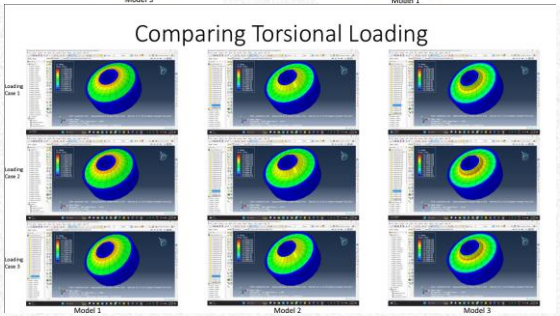
DESIGN & ANALYSIS

Master's Course in FEM of Automotive Structures

Final Project- Stress and Strain analysis of Damping Rubber Bearing and development of new improved design



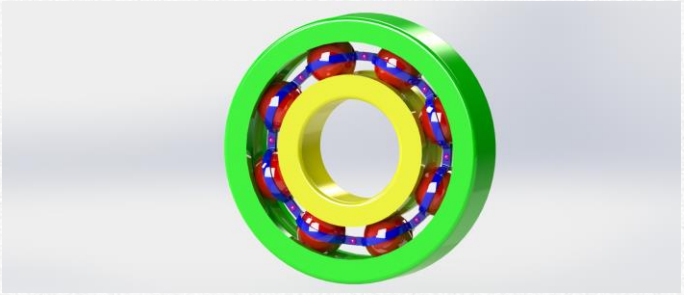




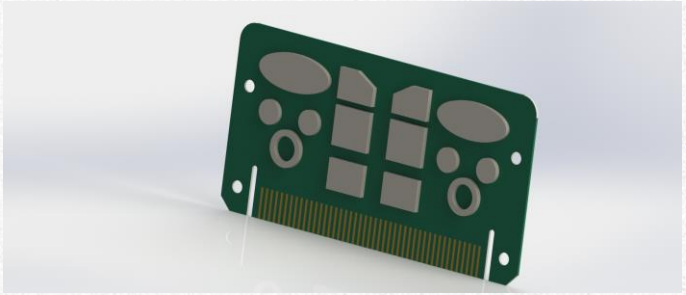
Final Results of the analysis gave values of least deformations and least peak loads in our design which was chosen to be used as final product

DESIGN & ANALYSIS

Miscellaneous CAD Designs

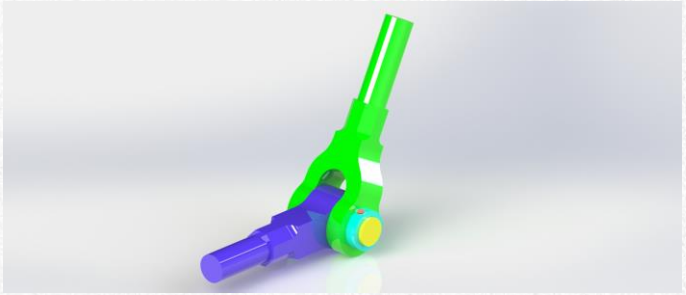


Ball Bearing Model



RAM PCB Chip

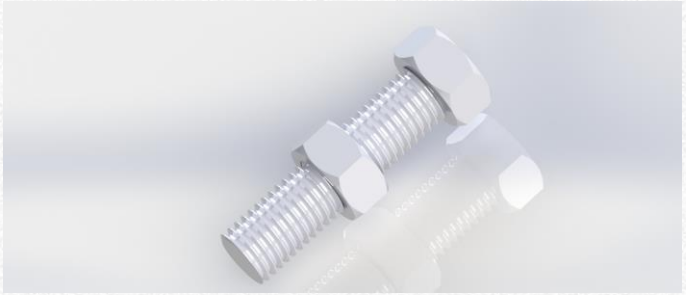
Modern Car Keyfob



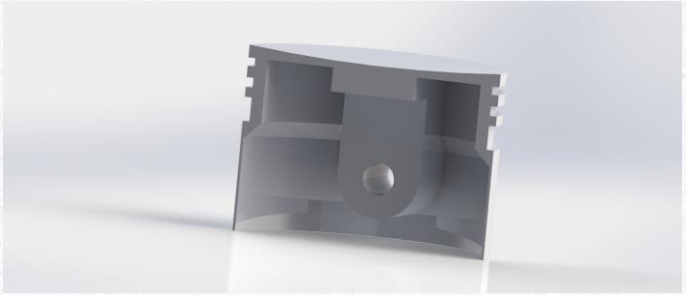
Knuckle Joint

DESIGN & ANALYSIS

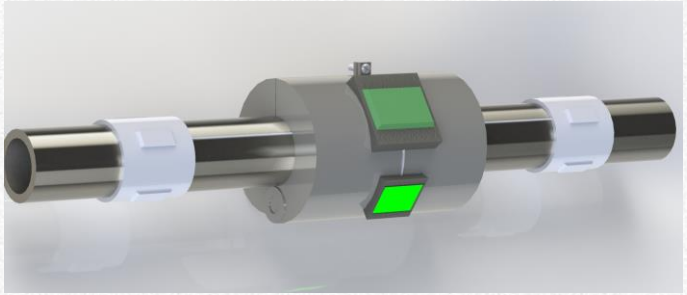
Miscellaneous CAD Designs



Nut and Bolt model with thread alignment



Piston Head Cut-through

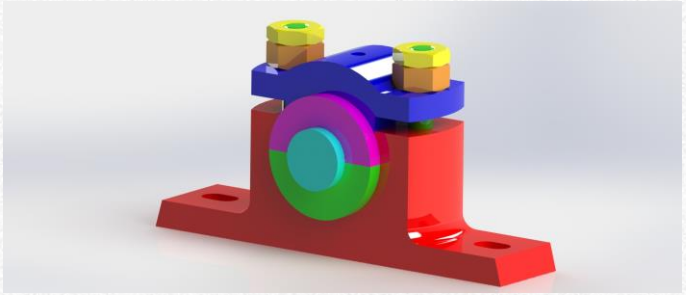


Prototype for non-invasive flowmeter

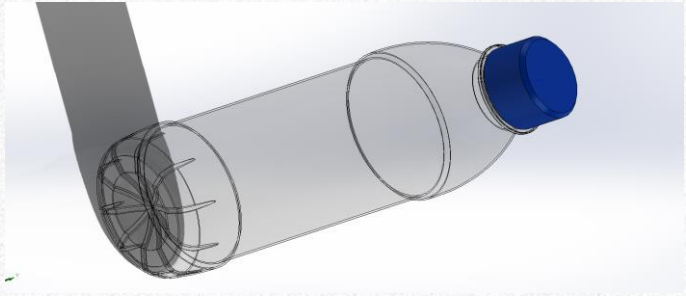
Luxury Plastic Water Bottle

DESIGN & ANALYSIS

Miscellaneous CAD Designs

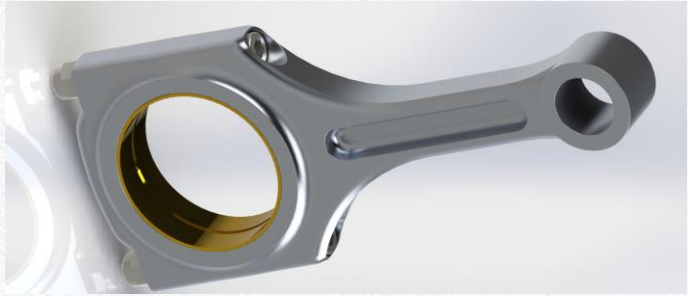


Plummer Block Bearing



Carbonated Drink Bottle

Freelance work: Battery pack model



Connecting rod assembly model

DESIGN & ANALYSIS

Miscellaneous CAD Designs

Modern V8 Engine Piston Head

Prototype design for Hot-Swappable Bull guard sensor array for AV Buses and Trucks

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