ADITYA CHAUGULE

ENGINEER . ROBOTICIST

in/adityachaugule/

https://github.com/Tys0nus

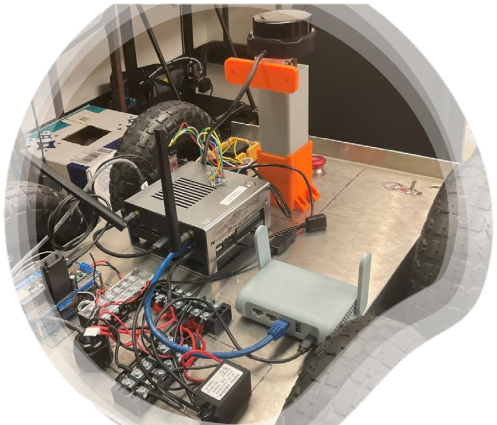
https://tys0nus.github.io/

Robotics

Master of Engineering,
University of Maryland, College Park

Mechanical Engineering

Bachelor of Engineering,
University of Pune



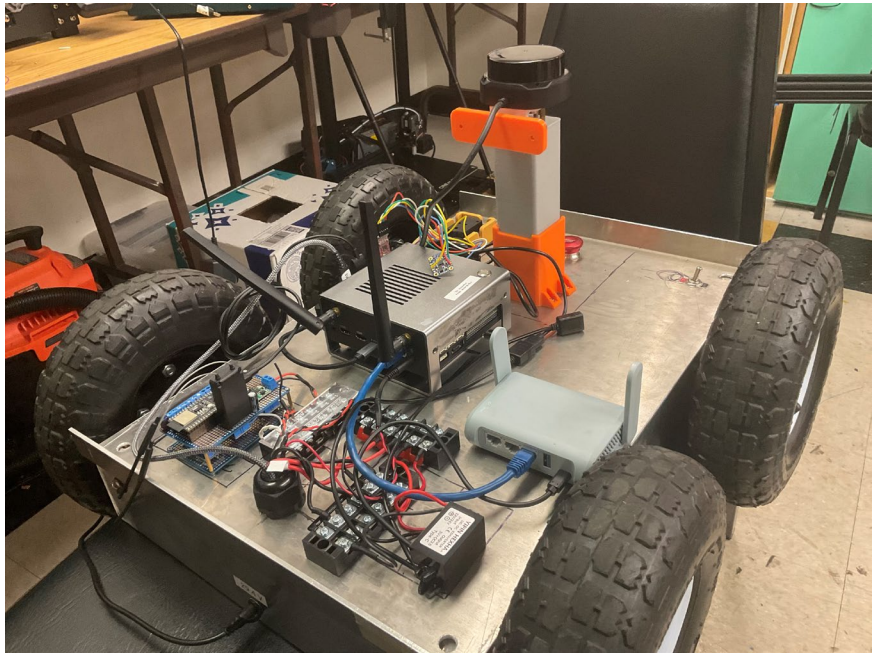
Robotics Engineer Intern

Kick Robotics

College Park, MD, USA

Validated custom ROS2 software package for SLAM & autonomous navigation, resulting in 20% improved navigation accuracy

Integrated Camera and Lidar sensors, conducted rigorous testing, enhancing client's warehouse monitoring capability



Mechanical Engineer Intern

Mechatol Engineering Solutions

Pune, India

Utilized Ashby Chart for optimal material selection through MADM-AHP process

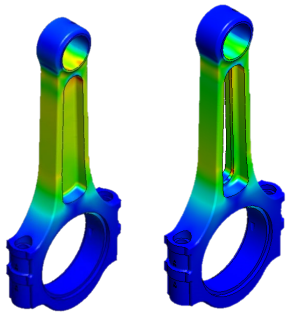
Engineered components through design calculations of Engine Components - Piston, Connecting Rod and Crankshaft

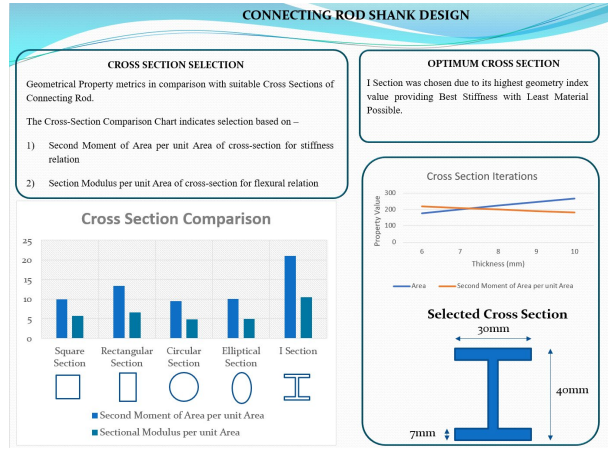
Developed detailed 3D models and assemblies using SolidWorks

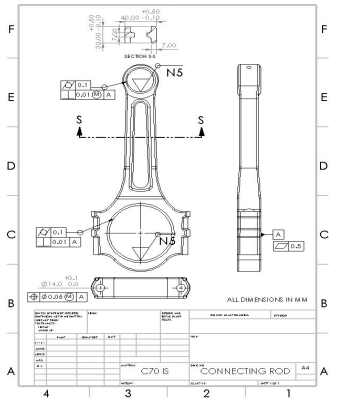
Conducted comprehensive FEA study using SolidWorks for Weight and Topology optimization

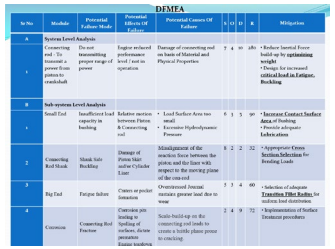
Created precise manufacturing drawings

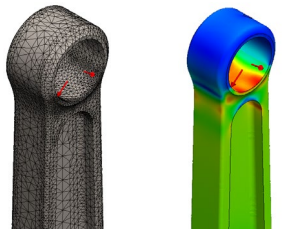
Costing and Estimation & Bill of Material

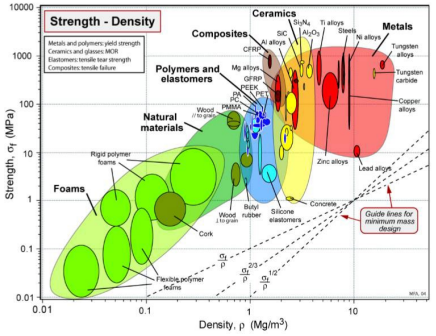


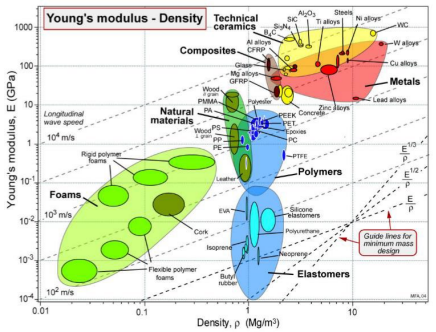






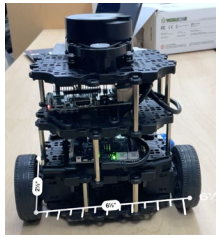
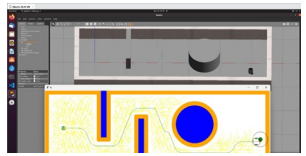
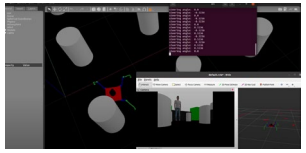
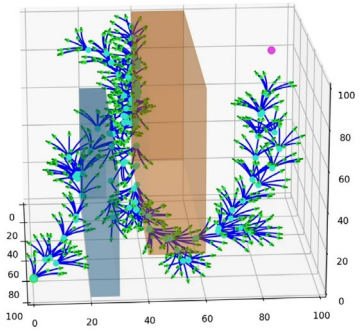
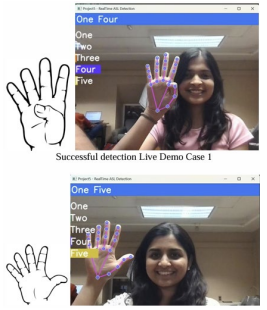




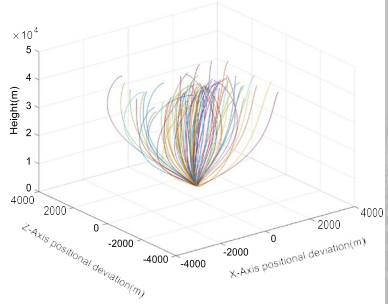


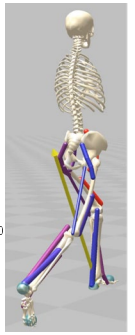
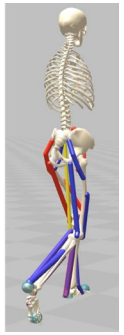
Robotics

Project Highlights

Successful detection Live Demo Case 1



Quadruped Spiderbot

- Designed a teleoperated Quadruped Spider robot with 8 DOF, 4 arms utilizing DH parameters to model the robot and integrated Camera and LiDAR sensors
- Simulated ROS-enabled robot in Gazebo to emulate inverse kinematics capable of maximum speed of 0.8m/s and a maximum payload capacity of 1kg

RRT non-holonomic Path Planning in 3D Neurosurgical Environment

- Developed a Rapidly-exploring Random Trees (RRT) path planning algorithm with non-holonomic constraints for steerable bevel-tipped needles in a 3D environment

Fault Level Diagnosis for estimating Gearbox degradation

- Deployed a LSTM based classification algorithm to identify the gearbox degradation level from a set of triaxial vibration signatures for varied operating conditions of speed and torque achieving a 98% accuracy

Design of Output Feedback Controllers - LQR, LQG

- Analyzed Controllability and Observability by linearizing the non-linear dual pendulum cart system
- Designed LQR & LQG controllers, ascertained stability of the closed-loop system through Lyapunov stability criterion and simulated system response to reject constant force disturbances

Predictive Entry Guidance for Vertical Rocket Landing

- Developed a high-fidelity simulation for vertical rocket landing using advanced control system, optimizing the guidance algorithm via Monte Carlo simulations & achieving a landing precision within 10 meters under varied conditions.

Muscle-Reflex driven Design & Control of Exoskeleton

- Designed and analyzed a simulation of fatigue driven muscle-reflex exoskeleton control system to assist individuals with spinal cord injuries, enhancing gait stability through neuromuscular control and biomechanical analysis

Powertrain Engineer

Resonance Racing

Pune, India

Conducted detailed strength and material selection calculations for the design of custom gearbox and final drive axles

Streamlined the CAD process for the ATV's full vehicle assembly and sub-assemblies, achieving a 150% improvement in lead time

Collaborated to produce detailed reports, presentations, and spreadsheets for the Final Design Report and Design Evaluation Events

#Transforming Willpower into Horsepower

Powertrain Division Lead

Resonance Racing

Pune, India

Formed and led a high-performing 5-member team, delegating key tasks to junior members to successfully develop a robust Drivetrain Unit for the ATV

Engineered a custom 2-stage reduction gearbox, integrating a Design Verification stage using industry-standard KISSsoft software

Enhanced design validation and testing by implementing SAE and BIS standards, increasing efficacy and failure mode detection by 20%

Directed the cost evaluation of the project, developing comprehensive cost models to optimize budget allocation

#Transforming Willpower into Horsepower

Team Captain

Resonance Racing

Pune, India

Spearheaded 25 Member Team spanning 7 divisions - Technical, Manufacturing & Marketing Departments, led Red- Team reviews and directed a budget of 25,000+ USD, strategically allocating funds to key development initiatives

Regulated administrative functions - reviewing reports, approving expenditures, enforcing rules to ensure goal-oriented

Project Execution improving productivity by 33% & cost-effectiveness by 15%

Resonance Racing | TITAN 2.0 Journey | BAJA SAE 2020 - YouTube

#Transforming Willpower into Horsepower

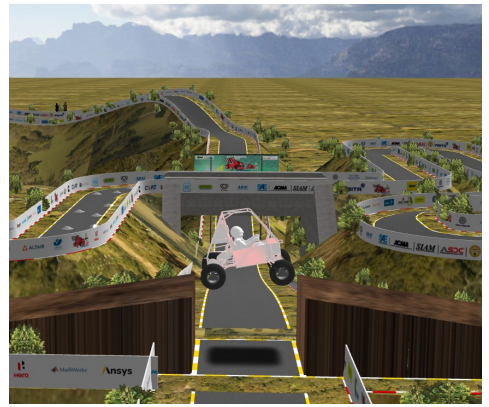
Virtual Dynamics Division Team

BAJA SAEINDIA

India

Conducted IPG CarMaker training sessions for over 800 engineering students, facilitating the creation of digital-twin all-terrain BAJA buggies.

Race commentator for 5000+ live audience for the 15th edition of the BAJA SAEINDIA endurance race



#Strategies Revamped

Virtual Dynamics Division Lead

BAJA SAEINDIA

India

Led nationwide training for 1000+ engineering students on digital-twin BAJA buggy development, establishing and enforcing comprehensive rules and regulations for electric & combustion vehicle simulation on off-road conditions

Introduced and administered the Validation Event for 170 student teams to corroborate virtual vehicle fidelity with physical vehicle performance through a real-time simulator setup

#Refuel Recharge Reinvent

Air Brakes Controls Engineer

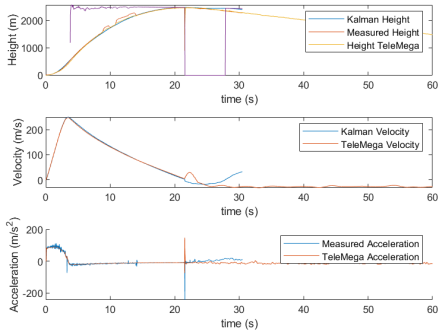
Terrapin Rockets

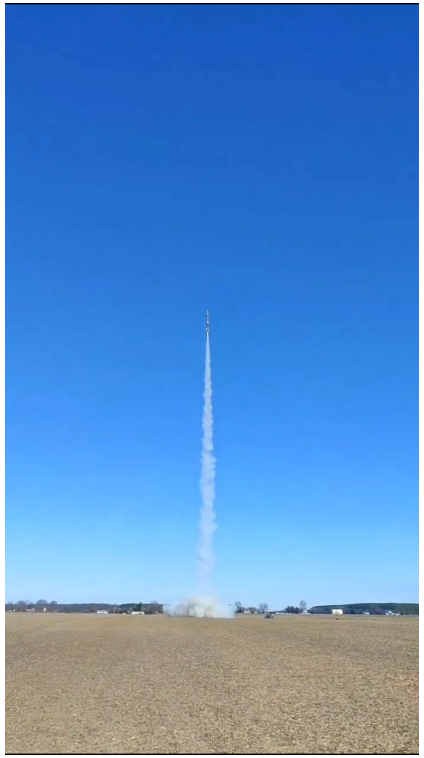
College Park, MD, USA

Simulated feature parameters to identify, finetune and predict controller performance based on actual flight launches

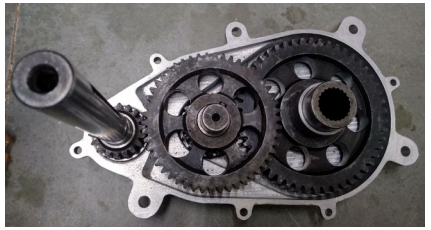
Developed library packages, including a multivariate Kalman Filter and sensor integration for the team's flight software

Engineered a custom controller design for a high-powered sounding rocket's air brake system, aimed at achieving a target apogee of 10,000 ft

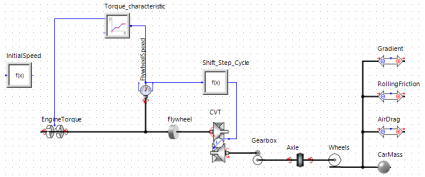




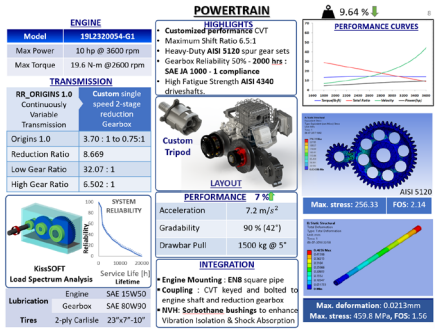
Technical Showcase



Single speed 2-Stage Gearbox



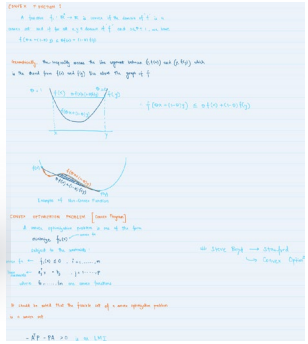
System Level Performance Analysis of ATV

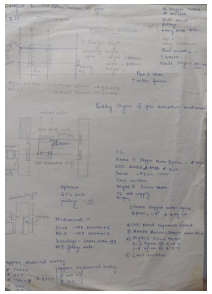


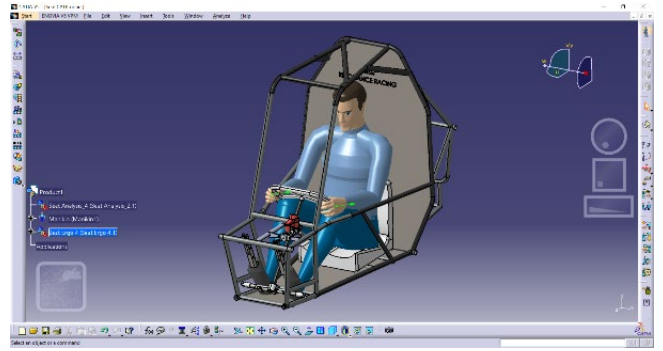
Powertrain System Design (Overview)

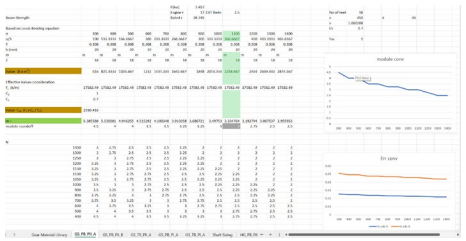
Full Vehicle CAD Assembly (Solidworks)

Powertrain CAD Assembly

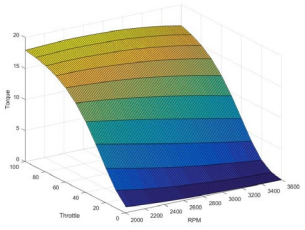






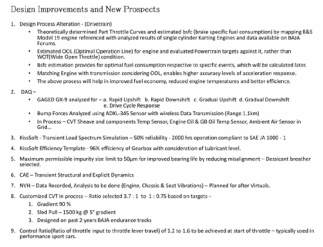


Powertrain System Calculations

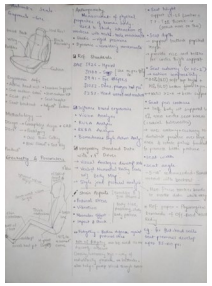


BAJA Engine Mapping

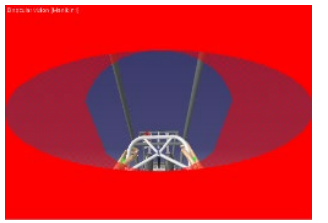
CVT Components

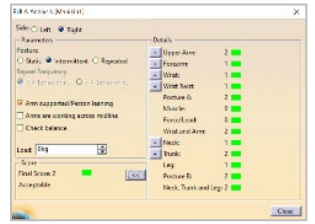


Design Prospects



Brainstorming & Thinking



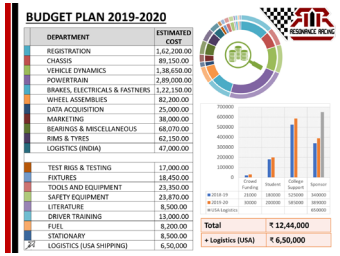


Ergonomics Verification – RULA Analysis

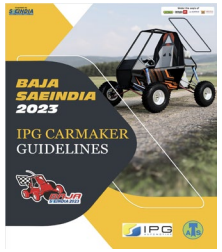
OffRoad Digital Twin Track Design

Data Acquisition & Tuning

Sponsorships



Budgeting



Technical Documentation

Certifications

Solidworks

Dassault Systems

Lean Six Sigma Green Belt

Accredited by ASCB(E)

ASIAN INSTITUTE OF QUALITY MANAGEMENT

(A Division of Vijgeesha Q.M.S. Pvt. Ltd.)

[Accredited by ASCB (Europe) Limited - U.K. for training in Quality Assurance, Auditing and Lean Six Sigma Courses]

Regd. Office

Presented to

ADITYA PRAKASH CHAUGULE

In recognition of having successfully completed training & assessment for

Lean Six Sigma Green Belt Certification

Conducted by us during 1st, 2nd, 3rd March 2019 and passed in Ex Grade

Cert. No. AM-3426 Date: 09.04.19 Director

INDIA

Grades:	Ex: Above 80%	A+: 70 to 79.9%	A: 60 to 69.9%	B: 50 to 59.9%

Something More..