GOKUL GS

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SUMMARY

Mechanical Engineer with expertise in simulation, software development, and cross-disciplinary R&D. Adept at leveraging analytical tools and automation techniques to enhance system performance. Eager to apply robust technical skills and problem-solving abilities to drive innovation in robot programming and design.

EDUCATION

APJ Abdul Kalam Technological University   **2019 - 2023**
Bachelor of Technology, Mechanical Engineering
- **GPA:** 8.3
- **Achievements:** 8.3

N S S Public School   **2018 - 2019**
12th, Science
- **GPA:** 75.6
- **Achievements:** 75.6

WORK EXPERIENCE

Indian Space Research Organization (ISRO)   **Jun 2025 - Present**
R&D Engineer – Mechanical & Software Systems (Contractual)   *Thiruvananthapuram, Kerala*
- Engineered a standalone GUI in MATLAB App Designer for conducting Operational Modal Analysis by integrating multiple OMA methods, thereby streamlining data input, processing, and visualization in alignment with engineering design verification standards.
- Created a Python-based automation tool to generate X, Y, Z coordinates in the weld area of motor cases using CMM and thickness data, facilitating accurate profile extraction for FEM analysis in ANSYS and demonstrating application of standard engineering techniques.

Indian Space Research Organization (ISRO)   **Jun 2024 - 2025**
Graduate Engineer Trainee (Research and Development)   *Thiruvananthapuram, Kerala*
- Developed a neural network model to predict aerospace hardware deviations for design clearance with over 99% accuracy and integrated it with a user-friendly GUI, supporting technical evaluation and verification processes.
- Co-authored papers on a neural network surrogate model for aerospace hardware deviation prediction, contributing to proposal presentations and technical communications in national and international forums.
- Formulated a Python-based algorithm to compute time-varying propellant surface area for thrust/pressure prediction in a multi-segment Solid Rocket motor case, enhancing accuracy by 20% compared to traditional geometric methods.
- Redesigned a composite upper-stage vibration test fixture by developing a dynamically equivalent metallic fixture for the launch vehicle's Velocity Trimming Module (VTM), achieving over 95% dynamic equivalence through rigorous frequency and random response analysis using NASTRAN.
- Validated flight hardware by predicting microstrains via Finite Element Analysis in NASTRAN and correlating results with strain gauge sensor test data, achieving correlation coefficients exceeding 0.96 and ensuring adherence to engineering guidelines.
- Designed mechanical components for a satellite damping system using SolidWorks and performed structural and modal simulations in ANSYS to ensure less than 5% deformation, thereby maintaining design integrity and compliance with stringent verification standards.

PROJECTS

Autonomous Mobile Robot Simulation | ROS2, Gazebo, RViz   **Mar 2025 - Apr 2025**
- Modeled a mobile robot using URDF, visualized and validated its structure in RViz, and implemented motion control through ROS2 plugins; blended with SLAM for real-time mapping and autonomous localization, and developed path planning and navigation algorithms using ROS2's Nav2 Stack for goal-directed movement with real-time obstacle avoidance in a simulated environment.

Boston Dynamics Spot Design (SolidWorks)   **May 2024 - Jun 2024**
- Designed a 3d model of the Spot Robot of Boston Dynamics in SolidWorks using a combination of surface and solid modeling techniques, achieving more than 95% geometric and visual accuracy.
- Incorporated advanced mating conditions and motion studies to simulate realistic joint articulation and walking sequences, enabling dynamic analysis and functional visualization of robotic movement.

Predictive Maintenance Analysis using different ML Algorithms (KNN, SVM, DT)   **May 2024 - Jun 2024**
- Analyzed predictive maintenance capabilities of multiple machine learning algorithms (KNN, SVM, Decision Trees) using sensor data from Amazon's warehouse robots to identify stability and potential failures.
- KNN and SVM models outperformed others, achieving a 96% prediction accuracy, which enhances early fault detection and minimizes downtime in smart warehouse operations.

SKILLS

- **Programming & Simulation**: Python, ROS2, Matlab, Machine Learning
- **CAD & Engineering Tools**: Solidworks, Ansys, Patran & Nastran, KiCad, AutoCAD
- **Technical Expertise**: Mechatronics
- **Professional Skills**: MS Office, Documentation, Communication, Teamwork, Reliability, Leadership

CERTIFICATIONS

- **ROS2 Nav2 [Navigation 2 Stack] - with SLAM and Navigation**: Udemy
- **ROS2 for Beginners Level 2- Tf | URDF | RViz | Gazebo**: Udemy
- **ROS2 For Beginners**: ROS Foxy, Humble - 2025 - Udemy
- **ROBO_AI - TOPAZ Robotics Internship**
- **Advanced Driver Assistance Systems**: Udemy
- **Ford EV Engineering**: Forage
- **GE Aerospace Explore Engineering**: Forage
- **Introduction to Self-Driving Cars**: University of Toronto, Coursera.
- **Certified SolidWorks Associate**: Udemy