Sakshi Shah

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Education

Master of Science in Mechanical Engineering   **Aug 2023 – May 2025**
North Carolina State University   GPA: 4.0/4.0
Relevant Coursework: Vibrations, Design of Electromechanical Systems, Industrial Automation, Optimization, Advanced Dynamics, Controls

Bachelor of Technology in Mechanical Engineering   **Aug 2017 – Jun 2021**
Savitribai Phule Pune University   GPA: 8.45/10.0

Skills

- **CAD and Modeling Tools:** SOLIDWORKS, Creo, AutoCAD, Autodesk Inventor
- **Manufacturing & Process Tools:** SAP PLM, Power Apps, PreForm, Ultimaker Cura, Minitab
- **Analysis & Simulation:** FEA, Magnetic Circuit Analysis (MCA), ANSYS (Maxwell, Mechanical)
- **Programming & Automation:** Python, MATLAB, PostgreSQL, Excel VBA, Connected Components Workbench

Experience

Jr Mechanical Engineer | End of Arm Tooling   *July 2025 – Present*
FIPA Inc., Durham, North Carolina

- Constructed robotic End-of-Arm Tooling (EOAT) assemblies from 3D Inventor CAD models, ensuring functional performance and reliability.
- Assisted with management of inventoried and non-inventoried parts, maintaining engineering documentation, traceability, and adherence to internal quality management procedures, ensuring on-time shipment of consumer products.

Graduate Research Assistant | MATLAB, Simulink, Prototyping   **Jan 2025 – May 2025**
Neuromuscular Control and Rehabilitation Lab, North Carolina State University

- Designed, prototyped, and 3D-printed SOLIDWORKS parts and linkages to integrate lateral movement into a wearable exoskeleton, enabling innovative medtech design and improved user adaptability.
- Developed a closed-loop image-based visual servo control system for a 7DOF robot to track dynamic objects using an eye-in-hand camera configuration, leveraging MATLAB Simulink.

Process Development Engineer | Designing, Prototyping, Medical Device   **May 2024 – Aug 2024**
Tioga Cardiovascular, Los Gatos, CA

- Supported biomedical process development and RD to optimize the product development of the Luna™ TMVR catheter during the pre-commercialization phase.
- Designed and iteratively tested SLA-printed fixtures in SOLIDWORKS and PreForm, applying Design for Manufacturing (DFM) principles to ensure reliability and ease of assembly in clinical device builds.
- Modeled geometries and assemblies for rapid prototyping and evaluation; applied GD&T to define mechanical tolerances, collaborated on design reviews, and authored approval requests (ARs) and equipment specifications for assembly, rework, and quality inspections.

Associate Engineer, Power Distribution & Controls | Python, VBA, SAP   **Aug 2021 – Jun 2023**
Eaton, Pune, India

- Modeled assemblies and produced detailed component drawings for 250+ customer orders, streamlining the Engineering-to-Order (ETO) process by 34% through Continuous Improvement (CI), statistical analysis, and automation (Python, VBA, Power Apps); Six Sigma Green Belt (DMAIC) certified.
- Led Engineering Change Requests (ECRs) and Sustaining Engineering projects to resolve technical issues and address customer needs, collaborating across design, manufacturing, and procurement functions in a regulated industry.
- Standardized Bills of Materials (BOMs) and technical documentation in SAP PLM, improving data accuracy and traceability while reducing part variations by 96%, thereby increasing mechanical assembly efficiency and improving resiliency.

- Delivered $100K in cost savings by applying Design for Assembly (DFA) and Value Analysis/Value Engineering (VAVE) to optimize sheet metal component designs by identifying solutions for performance and cost objectives.
- Created drawings, documentation, and BOMs for customers and suppliers to support fabrication and assembly of Medium voltage regulator.

Projects

Design of an Automobile Cruise Control system |PID, Simulink

- Designed a state-feedback PID controller for a car cruise control system using control engineering principles.
- Analyzed stability using Nyquist and Root Locus plots, for an overshoot of less than 10% and rise time less than 10s.

Nonlinear Controller Design |Non-Linear Controls, Simulink

- Designed and simulated Sliding Mode Control to achieve superior disturbance rejection with near-perfect tracking, and Adaptive Control to reduce steady-state error by 50% compared to Exact Model Knowledge.
- Evaluated computational efficiency and stability, finding that Adaptive Control balanced efficiency and performance, with 20% faster computational time.

System Integration and Control of an Autonomous Conveyor System |PLC, PostgreSQL, ML Algorithms

- Developed a Flask/PostgreSQL web application enabling remote access via Modbus TCP/IP and MQTT, for a Micro800 PLC-based color sorting system.
- Integrated sensors and actuators, reducing manual intervention by 50%.
- Integrated machine learning models (Linear and Ridge Regression, Decision Trees) for processing time prediction.

2-Pole Electro-Permanent Magnet Clamp for Workpiece Holding |FEA, MCA

- Optimized the design of an Electro-Permanent Magnetic Clamp using Magnetic Circuit Analysis (MCA) and Finite Element Method Magnetics (FEMM), achieving a vertical reluctance force of 1460 lbf.
- Validated FEMM data through 3D analysis in Ansys Electronics Desktop, ensuring accurate force calculations and identifying potential saturation effects within the EPMC design.

Equilibrium Analysis and Optimization of a Spring-Coupled Cart System | MATLAB, Optimization Toolbox

- Developed and analyzed optimization models to minimize potential energy in a spring-coupled three-cart system using Steepest Descent, Fletcher-Reeves and BFGS algorithms.
- Compared convergence rates and computational cost of gradient-based and quasi-Newton methods using MATLAB's `fminunc`, and performed sensitivity analysis on step size and gradient estimation techniques.

Simulation of Linear and Non-Linear Spacecraft Attitude Dynamics | MATLAB, ODE45

- Re-derived and validated attitude dynamics equations from research literature using standardized notation to ensure numerical and analytical consistency.
- Simulated and compared linear vs. nonlinear models under small angle assumptions, quantifying approximation errors and defining validity bounds.

Research Engineer (Co-op Bamboochi Bicycles, Mumbai, India) | FEA, SOLIDWORKS, AutoCAD

- Defined chassis design parameters and modeled the drivetrain in MATLAB to assess stability and control.
- Developed and rendered the frame design, and performed structural analysis using Finite Element Analysis (FEA) in SOLIDWORKS and ANSYS Mechanical.