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

- **Programming and Scripting:** Python, MATLAB, Simulink, C, PostgreSQL, Excel VBA
- **Robotics and Automation:** ROS, OpenCV, Connected Components Workbench
- **Modeling Tools:** SOLIDWORKS, AutoCAD, Autodesk Inventor, ANSYS (Structural & Electronics)
- **Manufacturing and Planning:** SAP PLM, Power Apps, PreForm, Ultimaker Cura

Experience

Jr Mechanical Engineer | End of Arm Tooling *July 2025 – Present*
FiPA, Raleigh, North Carolina

- Assembling robot end-of-arm tooling (EOAT) and degating systems to support injection molding operations.
- Interpreting CAD Designs of custom tools and automated equipment by gathering measurement data.

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

- Designed linkages in SOLIDWORKS to incorporate lateral movement capability in a wearable exoskeleton.
- Prototyped and 3D printed parts using Ultimaker and integrated motors for smooth and precise actuation.camera.

Process Development Engineer | 3D Modeling, Prototyping, PreForm **May 2024 – Aug 2024**
Tioga Cardiovascular, Los Gatos, CA

- Supported process development and R&D in optimizing the manufacturing process of the Luna TMVR product.
- Designed SLA-printed fixtures in SolidWorks and PreForm to enhance vibration damping and test the delivery system, focusing on Design for Manufacturing (DFM) for ease of production and assembly.
- Designed and refined engineering drawings with GD&T, and developed controlled documents for testing and quality inspections. Participated in design reviews.

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

- Designed assemblies and drafted components for 250+ customer orders, streamlining the Engineering-to-Order (ETO) process by 34% through Continuous Improvement (CI) and automation tools (Python, VBA, Power Apps); Six Sigma DMAIC certified.
- Led Engineering Change Requests (ECRs) and Sustaining Engineering projects, supporting Operations and Quality teams in part procurement, manufacturing, and assembly.
- Standardized Bill of Materials (BOM) and technical documentation within SAP PLM, enhancing data accuracy and traceability. Reduced part variations by 96%.
- Realized $100K in cost savings via Design for Assembly (DFA) and Value Analysis/Value Engineering (VAVE), by identifying solutions for performance and cost objectives.
- Enhanced TAKT times by applying Value Stream Mapping and 6S principles to optimize the Kanban area for coil winding, resulting in a 5% increase in productivity.

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.