

YOGI SHAH

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EXPERIENCE

- Mechanical Engineer** | *Silicon Synapse Lab* Dec. 2023 – Dec. 2025
- Architected 90% of Husky V3 quadruped-to-UAV transformable robot components, introducing hollow tube torso architecture that reduced pitch twist by 50% and cut **3D-printed assemblies** threefold, enabling efficient multimodal path planning across quadruped and flight modes
 - Configured dual-contact hollow tube hip and upper leg connections, optimizing moment arm positioning to reduce actuator torque, enhance load capacity, secure gripper engagement, streamline wire routing, and improve flight safety margins
 - Developed and tested Print-in-Place (PIP) revolute **joint mechanism** using dual-material 3D-printed living hinges, eliminating post-assembly operations and enabling monolithic joint modules for rapid design iteration and modular reconfiguration
- Electrical Engineer Intern** | *Festo Corporation* Jul. 2024 – Dec. 2024
- Fabricated TEC PCB from schematic through SMD assembly and validation, enabling dew point control for industrial air cooling subsystems
 - Implemented solenoid valve driver circuit, achieving 3ms response time and 85% power efficiency for precision 2bar air flow control
 - Validated PID-based PWM controller across various temperature sensors, achieving $\pm 1.5^\circ\text{C}$ accuracy within 300ms settling time for stable thermoelectric cooling operation
- Design Intern** | *Panache Digilife Limited* May. 2022 – Jun. 2022
- Prototyped SCARA robot-based **automatic screwing system** for laptop assembly, automating M2-M5 fastener screwing
 - Demonstrated 30% production efficiency improvement and 20% monthly labor cost reduction through automated torque-controlled screwing mechanism, validated via prototype testing across multiple fastener configurations and assembly scenarios

PROJECTS

- Aerobat (Silicon Synapse Lab)** | *CAD & DFMA, GD&T, Engineering Documentation* Jan. 2024 – Dec. 2025
- Redesigned Aerobat wing components in SolidWorks and optimized through iterative testing, reducing structural weight by 20% while maintaining aerodynamic performance for sub-100g flapping-wing platform
 - Engineered **multi-material living hinge** joint using PLA & TPU via additive manufacturing, achieving 120+ flexion cycles
 - Characterized flapping aerodynamics using load cell testing rig and robotic arm, quantifying peak lift force of 0.8N per cycle, validating wing design meets flight requirements for autonomous micro-aerial vehicle
- Liquibot-Bartending Robot** | *ROS, OpenCV, SLAM, Solidworks* Jan. 2025 – May 2025
- Designed custom **mecanum-wheeled mobile base** from ground-up architecture with 250g payload capacity, enabling stable multi-directional locomotion and dual-task autonomy for simultaneous bartending and waiter operations via ReactorX200 arm integration
 - Deployed ROS2-based SLAM pipeline using RealSense D455, RTAB-Map, and A-Star path planning, achieving $\pm 3\text{cm}$ localization accuracy and 85% collision-free autonomous navigation across dynamic indoor environments via Raspberry Pi 4B
 - Integrated OpenCV object detection (90% accuracy) with arm-base motion control, enabling autonomous drink preparation and slosh control
- Foot Pressure Measuring System** | *Python, Prototyping, Desgin* Oct. 2023 – Dec 2023
- Prototyped Velostat pressure sensor system achieving 25% lower power draw and $\pm 5\%$ accuracy, enabling wireless gait analysis data acquisition
 - Constructed signal processing and visualization framework using MATLAB and Python to map pressure distribution across foot zones, revealing gait asymmetries and load concentration hotspots with 20% detection sensitivity
- Vehicle Alert System using Autonomous Control** | *Solidworks, OpenCV, ROS* Oct. 2022 – Mar. 2023
- Developed **ADAS vehicle control system** integrating real-time eye-closure analysis (68-point facial landmarks) with multi-sensor perception, enabling autonomous lane management, speed modulation, and safe parking
 - Prepared a RC vehicle prototype combining SolidWorks motion analysis, OpenCV vision pipeline, and Arduino-Raspberry Pi 4B communication, executing real-time drowsiness detection and autonomous behavioral planning for highway safety

TECHNICAL PROFICIENCIES

Languages: Python, C, C++, Embedded C, MATLAB, XML, ROS, ROS2
Platforms: SolidWorks(CSWA & CSWP), Fusion360, Gazebo, VS Code, LabView, EasyEDA(PCB Designing)
Frameworks: URDF, Tensor, OpenCv, PyTorch, SLAM, AI
Laboratory: Lazer Cutting, 3D printing (SLA & FDM), Woodworks, SMD Soldering, Metalworks, Material Testing and Analysis
Core Competencies: Cost-conscious, Value engineering, Problem-solving, Organizational skills, Work independently, Collaborative

PUBLICATIONS

B. Gupta, Y. Shah, T. Liu, E. Sihite and A. Ramezani, "Banking Turn of High-DOF Dynamic Morphing Wing Flight by Shifting Structure Response Using Optimization," 2024 IEEE International Conference on Advanced Intelligent Mechatronics (AIM)
<https://ieeexplore.ieee.org/abstract/document/10637200>

Shah, Yogi. "The Design of Husky V3." Engineering Archive, 16 Dec. 2025. engrxiv.org, <https://doi.org/10.31224/6007>.

EDUCATION

Northeastern University Boston, MA
Master of Science in Robotics, Conn. in Electrical and Computer Engineering (GPA 3.54/4.0) Sept. 2023 – Dec. 2025

NMIMS University Mumbai, India
Bachelor of Technology in Mechatronics (GPA 3.45/4.0) Jul. 2020 – May 2023