

DHYEY MIHIR SHAH

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EDUCATION

University of Pennsylvania

MSE Robotics: 3.9 GPA

Philadelphia, PA

2024 - 2026

Pandit Deendayal Energy University

B.Tech Electrical Engineering: 9.03 CPI

Gandhinagar, GJ

2018 - 2022

WORK EXPERIENCE

Research Assistant – GRASP LAB, Figueroa Robotics Lab | University of Pennsylvania

Sept 2025 – Present

- Designing and building a lightweight, on-joint actuator mounted elbow exoskeleton to assist activities of daily living for the upper body. Simultaneously working to develop an intelligent controller using sEMG sensors attached on the participant to timely actuate the motor torque based on user muscle fatigue for the classified tasks.

Research Assistant – GRASP LAB, Kod*Lab | University of Pennsylvania

Jan 2025 – Present

- Building a simulation for a Slot-Hopper Template as a reduced order model representing the complex dynamics for a Dynamic Origami Quadrupedal robot. Implementing an active damping controller to deduce a mapping between the template and the anchor robot to induce desired gait behaviours

Computer Vision Software Engineering Intern | ModalAI. Inc, USA

Jun 2025 – Aug 2025

- Developed real-time image processing pipelines for UAVs using the VOXL2 Mini and IMX664 module. Implemented a novel and robust non-learning based sky segmentation algorithm, utilizing the non sky pixel mask for a custom AWB and AE correction for deployment on the VOXL-Portal. Explored various GPU-accelerated filtering techniques to improve camera calibration, color enhancement and parameter tuning for a ROI-based stabilization method on the camera server

Junior Research Fellow - Human Centered Robotics Lab | Indian Institute of Technology, Gandhinagar

Sept 2022 – May 2024

- Research aimed at developing control frameworks for adaptive interventions using a multi-modal cable driven ankle exoskeleton. Developed wearable sensor systems for gait monitoring. Facilitated human experiments for balance response evaluation to visuo-spatial perturbation for elderly using VR, and data-collection for patients with Parkinson's Disorder

TECHNICAL PROJECTS

VAE-Augmented Imitation Learning for Scalable Robot Manipulation

April 2025 – May 2025

- Used latent trajectory representations to improve Behavioral Cloning for robotic manipulation tasks in a kitchen environment, by training a Variational Autoencoder on low-dimensional state data to capture motion intent, phase, and context to reduce reliance on vision in constrained environments. Integrated a LLM to translate natural language instructions into 3D spatial goals, enabling multi-object manipulation achieving efficient task execution in Robosuite simulations.

GPS-Denied Autonomy via Visual-Inertial Odometry for UAVs

Mar 2025 - April 2025

- Developed an autonomy stack for the CrazyFlie 2.0 by integrating VIO based state estimation with trajectory planning and SE(3) control. Utilized real-time sensor data from noisy IMU and stereo features to enable robust tracking with a local planner in obstacle-rich environments achieving reliable collision-free navigation in simulation and hardware testing.

Pick and Place Execution using Franka Emika Panda

Oct 2024 – Dec 2024

- Developed a motion planning algorithm for a 7-DOF Franka Emika robotic arm using ROS and Gazebo. Integrated Geometric Inverse Kinematics and bi-directional RRT for precise pick-and-place tasks, optimizing object detection and manipulation. Achieved faster real-time performance through an analytical Inverse Kinematics solution.

Autonomous Navigation and Target Engagement Robot Car

Oct 2024 – Dec 2024

- Designed and built a mobile robot to compete in a strategic game, integrating autonomous navigation using the HTC Vive lighthouse, wall-following using ToF sensing, and target-attacking capabilities using a custom control architecture. Implemented real-time WiFi control and developed robust mechatronic systems, to achieve precise ramp traversal and combat functionality.

Vision based Terrain Classification for a Cable-Driven Ankle Exoskeleton

Sept 2023 – May 2024

- Developed a real-time gait classification system with Intel RealSense D435i camera by training a custom CNN using PyTorch and OpenCV, optimized for deployment on NVIDIA Jetson Nano. Designed a hybrid vision and user motion (using IMU) based high-level controller for cable driven exoskeleton to apply gait-adaptive force profiles

Smart Shoe for Wireless Gait Monitoring using Differential Pressure Sensors

Aug 2023 - Sept 2023

- Developed smart insoles for real-time gait phase detection and ground reaction force measurement using differential pressure sensors and a custom trained CNN enabling portable visualization of pressure maps and real-time calculation of ground forces, integrated calibrated alongside the AMTI forceplate system

Dual Mode HVAC Twin Fan Controller System

Jan 2020 - Apr 2020

- Developed a dual mode Twin Fan controller as a redundant backup system using the PIC 16F1939 Microchip micro-controller and embedded C ensuring fault tolerance and operational safety in industry settings. Debugged PLC ladder programs, and designed custom PCBs using Altium. Worked on PCB assembly and circuit testing.

RESEARCH CONTRIBUTIONS

Machine Learning Driven-Wearable Sensor System for Foot Landing Classification in Badminton

Published: IEEE TENCON'24

INDUSTRY COMPETITIONS

SICK\$10 LiDAR Challenge 2025-26

Ongoing: Advanced to Phase 2 as one of the Top 15 teams Nationwide

SOFTWARE SKILLS

Programming Languages: Python, C/C++, C#, SQL, MATLAB, LabVIEW, HTML/CSS

Technical Skills: ROS, Gazebo, OpenSim, MuJoCo, OpenCap, Solidworks, Unity, Computer-Vision, Machine Learning, Git, Proteus, Microchip xlDE, Vicon Nexus, AMTI NetForce, Biometrics Analysis Software, iEEG

Libraries/Frameworks: Pytorch, TensorFlow, Keras, Sci-Kit Learn, Pandas, Numpy, Matplotlib, Seaborn, OpenCV