Shyam Ganatra

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EXPERIENCE

Graduate Research Assistant - HiMER Lab at ASU **Feb 24 - Present**

- Pursuing my master's thesis on "Unified Multimodal Learning for Robotic Manipulation: Vision, Language, and Video"
- Designed and implemented computer vision algorithms for humanoid robot (Reachy), enabling real-time object detection, shape recognition, and spatial awareness using 2D LiDAR mapping. Used **ROS2, Moveit2** and **OpenCV** with **78%** accuracy

Fleet Management Engineer - Recruit Robots **Jul 21- May 2022**

- Developed a sensor fusion system integrating LiDAR, GPS, and IMU data for real-time road object detection, tested in Gazebo and deployed on a robot fleet with **OpenRMF** and **ROS2**
- Enhanced object detection accuracy to **80%** using **OpenCV** and **Python**, reducing false positive detections by **20%** and improving overall algorithm performance by **15%**.

Project Trainee - (CAIR) - Defence Research and Development Organisation (DRDO) **Dec 2019-May 2020**

- Developed simulation, software, and hardware solutions for autonomous robot navigation using ROS. Created a dataset for AI model to differentiate between road and sidewalk with **90%** precision in lane detection

Founder – Kamdhenu Robotics **June 2020 - Oct 2023**

- Launched a robotics venture focused on building affordable educational robots and delivering custom **ROS** -based robots
- Created a **Navigation2** course for Robot Ignite Academy using TurtleBot3
- Developed a voice recognition module for Reachy Robot during Circuit Launch's CoLab program.

PROJECTS

Gestures and Object Detections

- Developed a pointing gesture recognition system integrated with Faster R-CNN to enhance object detection accuracy.
- Improved mean Average Precision (mAP) for COCO 2017 dataset objects by up to **4%** by directing model attention using pointing gestures, validated across 2,086 test frames.

Medical Assist Device (received Provisional Patent)

- Designed a wall-mounted frame pulley assembly for assisting individuals with upper extremity weakness in dressing.
- Enhanced adaptability and convenience by incorporating modular adjustable outriggers and 3D-printed components, with proposed upgrades such as automated grip mechanisms and emergency shut-off systems.

Predicting Remaining Useful Life

- Developed LSTM and XGBoost models to predict the Remaining Useful Life of turbofan engines using NASA's CMAPSS dataset.
- Achieved an RMSE of **20.3** by optimizing data preprocessing, feature extraction, and sequence padding, with potential improvements through real-time sensor integration and ensemble modeling for predictive maintenance.

EDUCATION

MS Robotics & Autonomous Systems Jan 2024 - Present
Arizona State University, Arizona, USA | GPA 4.0

B. Tech Electronics & Communication 2016-2020
CHARUSAT University, Gujarat, India

AWARDS & ACHIEVEMENTS

- **2nd Place – Los Alamos National Labs Hackathon** March 2025
  - Designed a robotics automation system to streamline DNA sequencer preparation and reduce contamination risk
  - Built a multi-stage pipeline using robotics arm, conveyor belts, sensors and laser cutter for package separation
- **Presented at IEEE VR 2025 – XRIOS Workshop** March 2025
  - Presented the paper "Enhancing Human-Robot Teleoperation through Depth Sensing and eXtended Reality" at the 4th International Workshop on eXtended Reality for Industrial and Occupational Supports (XRIOS)
  - Showcased a novel AR/VR + depth sensing system using humanoid robot (Reachy) and Intel RealSense, improving spatial awareness and task accuracy in humanoid teleoperation.

TECHNICAL SKILLS

Languages/ Software	Python, C++, MATLAB, ROS, ROS2, OpenCV, OpenRMF, Gazebo, ISAAC SIM, CI/CD
Certifications	Introduction to TensorFlow for AI, ML, & DL by deeplearing.ai e-Series Pro Track by Universal Robots Remote Sensing & Digital Image Processing of Satellite Data by NPTEL