

DEV PANKAJBHAI GOTI

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EDUCATION

Texas A&M University

Master of Science in Electrical Engineering | GPA: 4.0/4.0

College Station, TX

May 2027

Courses: Robotics and Spatial Intelligence, Linear Multivariate Systems, Probability and Random Processes for Information Science, Reinforcement Learning, Visual Navigation and Foundation Models of Autonomy, Computer Vision and Robot Perception

National Institute of Technology Karnataka, Surathkal

Bachelor of Technology in Electrical and Electronics Engineering | GPA : 8.70/10

Mangalore, India

May 2025

EXPERIENCE

Indian Institute of Space Science and Technology

Summer Research Intern, IASc Summer Research Fellowship Programme 2024

Thiruvananthapuram, India

May 2024 – July 2024

- Developed a deep reinforcement learning-based trajectory planner for a 7-DOF robotic arm, enabling dynamic, goal-directed motion in continuous state and action spaces
- Implemented and trained a PPO-based policy with neural network function approximation and custom reward shaping, learning collision-aware, smooth joint trajectories without explicit motion planning models
- Evaluated learned policies in simulation by tracking reward convergence, target accuracy, and trajectory smoothness, demonstrating reliable motion generation for high-DOF manipulators

PROJECTS

LiDAR and Camera Fusion for 3D Obstacle Detection

October 2025 – December 2025

- Developed a 3D obstacle detection pipeline using KITTI LiDAR data, incorporating RANSAC for road segmentation and voxel down sampling to reduce point cloud size by 73% for efficient processing
- Applied DBSCAN clustering to segment vehicles, pedestrians and real objects from point clouds and transformed ground-truth 3D bounding boxes between camera and LiDAR coordinates for precise evaluation
- Evaluated detection performance using IoU-based TP, FP, and FN metrics, enabling hyperparameter optimization, reproducible Python workflows, and seamless integration for future multi-sensor fusion

PRM-Nav

September 2025 – October 2025

- Designed and implemented a ROS2-based PRM autonomous navigation system using k-NN graph construction and Dijkstra's algorithm to generate near-optimal (10%), collision-free paths
- Improved system robustness and observability by handling unreachable goal cases and integrating RViz visualization of robot trajectories, obstacle maps, and planned paths for effective debugging and validation.
- Implemented stable closed-loop execution by developing collision checking, path smoothing, and lookahead-based control, enabling smooth and accurate tracking of multi-turn trajectories in dense obstacle scenarios.

Autonomous Navigation of a Differential Drive Robot using DRL

November 2023 – March 2024

- Built an autonomous navigation system using Deep Deterministic Policy Gradient (DDPG), integrating ROS2 and Gazebo and fusing LIDAR and encoder data for enhanced perception and decision making
- Implemented noise injection and randomized actions near obstacles to improve exploration and avoidance
- Designed a reward function balancing goal, obstacle avoidance, and path efficiency in dynamic settings

Low Light Image Enhancement using MIR Net

October 2022 – March 2023

- Developed MIR Net for low-light enhancement with multi-scale residual learning and channel attention
- Enhanced model with multi-scale residual learning and attention fusion to boost sharpness and suppress noise
- Refined model by optimizing Residual Blocks and Groups to enhance speed efficiency and feature extraction

SKILLS

Programming Languages: Python (Advanced), C (Intermediate), C++ (Intermediate)

Tools & Software: ROS, ROS2, MATLAB, Simulink, Gazebo, VS Code, Rviz, Conda, Jupyter

Libraries & Frameworks: NumPy, Matplotlib, Pandas, OpenCV, sci-kit-learn, Keras, TensorFlow, PyTorch

Technologies & Platforms: Docker, Linux, GitHub

EXTRACURRICULAR

CSD Robocon NITK

Mangalore, India

Vice Captain

Jun 2022 – April 2025

- Managed overall team operations for 40+ members, coordinating technical, finance, and media activities while overseeing budgets, sponsorships, and outreach for ABU Robocon International competition
- Engineered a four-wheel holonomic autonomous robot, integrating Raspberry Pi, Arduino, ESP32, IMU, encoders, odometry, and computer vision for precise navigation, object detection, and manipulation tasks