Rituraj Harish Navindgikar

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EDUCATION

Khoury College of Computer Science, *Boston, Massachusetts*
Master of Science in Robotics, concentration in computer science, **GPA: 3.6/4** *Dec 2026*
Relevant Courses: Robot Mechanics and Control, Robot Sensing and Navigation, Mobile Robotics, Robotic Science and Systems, Advanced Computer Vision, Autonomous Field Robotics

Pune University, *Pune, India*
Bachelor of Technology in Computer Engineering, **GPA: 3.8/4** *Aug 2024*

SKILLS

Programming: Python, C++, MATLAB
SLAM and Perception: Visual-Inertial SLAM (VIO), LiDAR SLAM, feature detection/tracking, IMU integration
Robotics Software: ROS2, OpenCV, Docker, Sensor fusion and Sensor calibration (extrinsic and intrinsic)
Simulation and Tools: Gazebo, Isaac Sim, Foxglove, Rviz2, Git
Soft Skills: Problem Solving, collaboration, adaptability, analytical thinking, growth mindset

WORK EXPERIENCE

Robotics Software Engineer, Intern *June 2025 – Aug 2025*
ArcBest Technologies, *Fort Smith, Arkansas*

- Developed a Visual-Inertial Odometry SLAM (Stereo Camera + IMU) for low texture, large scale repetitive-aisle warehouses; stabilized tracking via IMU Integration and robust feature detection and tracking for drift correction
- Tested the VIO SLAM on **Vaux Vision** (warehouse automation sensor suite) achieving drift-resilient localization with less than 10 cm error on extended forklift trajectories and complex warehouse environments
- Containerized this application using Docker; Absolute Trajectory Error (ATE) 0.20 meters, zero testing mis-localizations and 5 seconds recovery via pose injection if mis-localized or de-localized

Robotics Software Intern *July 2023 – July 2024*
RollNDrive Pvt. Ltd. *Pune, India*

- Developed a 2D SLAM framework integrating RGB-D Camera, IMU and LiDAR achieving 98% localization accuracy using Adaptive Monte Carlo Localization (amcl) for warehouse automation robots
- Engineered static path planning algorithms like pure pursuit for global planning and used reinforcement learning models (PPO) trained over 5000 episodes with accuracy of 98% for obstacle avoidance in local planning, reducing computation load by 70%
- Created comprehensive documentation including hardware integration guides, calibration procedures and automated tests suited that reduced system setup time by 40% and standardized SLAM deployments

RESEARCH AND LEADERSHIP

Research Assistant
Northeastern University, *Boston, Massachusetts* *March 2025 – Present*

- Built ROS2 sensor fusion framework for stereo cameras, LiDAR and IMU across SPOT, AgileX Scout, AgileX Hunter and Unitree Go2 with full IMU-camera, stereo and LiDAR-camera calibration
- Operated four robotics platforms for data collection, recording 1TB+ ROS bags for campus-scale mapping research

Programming Lead *Aug 2021 – Dec 2024*
Team Cipher, *Pune, India*

- Led a 30+ member robotics team at DD Robocon 2023, overseeing SLAM and motion planning modules, and mentoring juniors on implementing mapping and localization in ROS2
- Developed visual SLAM with sensor fusion (wheel encoders, IMU, LiDAR), improving real-time pose estimation accuracy by 40%, contributing to a top 10 national finish out of 100+ teams

PROJECTS

3D Tunnel Mapping using SLAM Nov 2024

- Deployed RTAB-Map (Stereo Camera + IMU) in GPS-denied, low-light tunnels at Northeastern University; produced a high-resolution 3D Map over 1.2 miles with 95% localization accuracy

Autonomous Navigation using ML & RL *Jan 2025*

- Implemented Reinforcement learning based obstacle avoidance algorithm boosting navigation success rates by 99% in complex, dynamic environments