Ninaad Damis

412-692-1889 | ninaaddamisms@gmail.com | NinaadDamis | NinaadDamis |

EDUCATION

Carnegie Mellon University Pittsburgh, PA
Master of Science in Computational Design Manufacturing *Aug. 2021 – Dec. 2022*
- Relevant Coursework: Introduction to Deep Learning, Computer Vision, Planning and Decision Making in robotics, ML and AI for Engineers, Visual Learning and Recognition, Robot Localization and Mapping.

Visvesvaraya Technological University (VTU) Bangalore, India
Bachelor of Engineering in Mechanical Engineering, GPA: 8.87/10 *Aug. 2015 – May. 2019*

SKILLS

Programming Languages: Python, C, C++, MATLAB
ML Stack: Pytorch, Scikit-learn, Pandas, Matplotlib
Application Software: ROS, ROS2, Gazebo, MoveIt, Linux, Simulink, Git, Docker

WORK EXPERIENCE

Tailos Austin, Texas
Robotics Software Engineer *Jan. 2023 – Jul. 2024*
- Led the development of a rendezvous-based coordinated multi-robot exploration algorithm for indoor spaces.
- Architected coverage planning algorithms for vacuum cleaning robots. Optimized edge cleaning to increase edge coverage by 70%.
- Developed a global state lattice planner to generate kinematically feasible collision-free paths. Implemented path post-processing algorithms to improve path quality.
- Deployed and maintained a graph-based localization and mapping system using onboard sensors including Lidar, Camera, IMU, and Wheel Odometry.

Barnstorm Agtech Pune, India
Robotics Engineer *Sep. 2020 – May. 2021*
- Led the development of a ROS-based Navigation stack for multipurpose agricultural robots.
- Implemented a lattice-based global planner along with a Timed Elastic Band local planner for generating paths in compliance with the robot's non-holonomic kinematic constraints.
- Setup an EKF for sensor fusion of data from RTK GPS, IMU and wheel encoders for accurate state estimation.

AARG Lab, International Institute of Information Technology Hyderabad, India
Research Associate, Advisor: Dr. Kamal Karlapalem *Jul. 2019 – Jun. 2020*
- Designed a fleet of ROS based 4WD skid steered robots for a Multi-Robot Payload Transport System.
- Formulated an experimental ICR based kinematic model using genetic algorithm for improved motion control.

RESEARCH EXPERIENCE

Carnegie Mellon University Pittsburgh, PA
Graduate Student Researcher, Advisor: Dr. Ji Zhang *Aug. 2022 – Jan. 2023*
- Collaborated to develop a ROS2-based autonomous navigation environment consisting of modules such as collision avoidance and terrain traversability analysis.
- Worked on the implementation of a hierarchical planner framework for efficient time-budgeted exploration.

PROJECTS

Robot Localization and Mapping Aug. 2022 – Dec. 2022
- Implemented a particle filter localization system for mobile robots using odometry and laser rangefinder data.
- Designed a 2D EKF-SLAM solver to estimate robot trajectory and landmark poses in an unknown environment.
- Constructed a Dense 3D SLAM system using projective ICP and point-based fusion for the ICL-NUIM dataset.

Inter-Vehicular Depth and Velocity Estimation using a Monocular Camera Feb. 2022 – May. 2022
- Modified Monoflex to regress for 3D key points from single image to predict depth of vehicles. Reduced dependence on data by implicitly learning for uncoupled representations (3D orientations) of a car maintaining similar AP.
- Integrated Monoflex depth predictions with a Kalman filter based tracking system for velocity estimation.

Computer Vision Jan. 2022 – May. 2022
- Implemented Spatial Pyramid Matching of image word maps to formulate a scene classification system.
- Performed 3-D Reconstruction using bundle adjustment and estimated Fundamental matrix with 8-point algorithm and RANSAC.

Manipulation planning towards a moving target in clutter. Aug. 2021 – Dec. 2021
- Implemented the Kinodynamic A* and PRM algorithms on the 6-DoF UR5e manipulator to dock a moving target platform in static cluttered environments.
- Integrated above planners in ROS using the MoveIt Interface, and visualized planners using Rviz.