

Mrunmayee Deshpande

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[Note: Holds H1-B visa with four plus years of validity OR F1 OPT extendable up to three years]

SUMMARY

I am pursuing full time opportunities in robotics perception, calibration, mapping, localization, sensor fusion and path planning. I have six plus years of hands on experience with IMU, camera, LiDAR, and radar processing for autonomous systems.

EDUCATION

Texas A&M University

Aug. 2021 - May 2025

PhD in Aerospace Engineering, Advisor: Dr. Manoranjan Majji

Thesis: Data-Driven Methods for Mapping, Localization and Sensor Optimization

University of Michigan

Aug. 2016 - May 2018

MS in Robotics

SELECTIVE COURSES & SKILLS

- Courses: SLAM, Machine Learning, Computer Vision, Deep Learning, Reinforcement Learning, Motion Planning, Optimal Control, Advanced Linear Algebra, Orbital Mechanics, Spacecraft Attitude Determination
- Languages & developer tools: C++, Python, MATLAB, VS Code, ROS, TensorFlow

RESEARCH EXPERIENCE

Land, Air and Space Robotics Lab, Texas A&M University

Nov. 2020 - May 2025

Research Assistant

College Station, TX

- Designed **scalable and adaptable** mapping and localization system for GPS restricted environments.
- Designed novel ambient magnetic field based **parametric map representations** with **flight path based trajectories**. Designed a localization system highlighting **high interest regions** in the map.
- Developed **continuous fit maps** to model ambient magnetic field data with **opportunistic feature extraction**.
- Designed **filtering and sensor fusion techniques** for indoor and on-road localization with IMU and magnetic field.
- Developed state estimator filters with **online calibration** of magnetometer and accelerometer with localization.
- Developed calibration for magnetometer with **Model Informed Neural Network** to compensate for the unknown noises.

Biped Robotics Lab, University of Michigan

Jan. - Apr. 2018

Research Assistant

Ann Arbor, MI

- Implemented state-of-the-art **semantic segmentation** neural networks on Cassie Blue robot for safe navigation.
- Tested the performance real time on **NVIDIA Jetson TX2** GPU in TensorRT SDK for semantic scene understanding.

PROFESSIONAL EXPERIENCE

Magna International & Magna Electronics

Jul. 2018 - Oct. 2020

Research Engineer

Troy, MI

- Developed perception and localization algorithms using a **cost effective sensors** stack for autonomous parking.
- Developed **probabilistic sparse occupancy grid** and object detection using limited field of view **LiDARs**.
- Designed perception and state estimation pipeline for the final **parking maneuver** of autonomous vehicle.
- Developed lane detection and customized marker identification using **surround-view and monocular camera**.
- Developed semantic segmentation pipeline to identify road objects using computer vision and learning based classifiers.
- Supported the development of **real-time object tracking** integrated with **high speed Radar** object detection module.

PUBLICATIONS

- Mrunmayee Deshpande, Manoranjan Majji, and J Humberto Ramos. Magnetic field aided vehicle localization with acceleration correction. In 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).[\[Link\]](#)

RESEARCH PROJECTS

Procter & Gamble Student Team Project

Jan. - Dec. 2017

- Developed autonomous product distribution on assembly lines with Universal Robot-10 and A-star path planning.

Enhanced Object Detection using soft Non-Maximum Suppression (NMS)

Dec. 2017

- Tested various soft-NMS mathematical functions to improve the performance of a baseline R-FCN architecture on Resnet-101. Observed improved results with Gompertz function over the traditional Gaussian function.

Autonomous Maze Solver Robot

Oct. 2016

- Implemented maze exploration using online SLAM with particle filter and collision-free A-star path planning.
- Created occupancy grid using 360° rotating LiDAR and coupled it with odometry for real time pose estimation.