

MONIKA NAGALLA

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EDUCATION

Worcester Polytechnic Institute, MA

MSc in Robotics Engineering

Jan 2021 - Present

GPA: 3.83/4.0

National Institute of Technology Calicut

Bachelors in Electronics and Communications Engineering

Aug 2014-May 2018

Focus: Robotics

SKILLS

Languages: Python, C++,C#, JavaScript.

Frameworks: Git, Docker, PyTorch, Tensorflow, ROS, Matlab/Simulink, Gazebo, CARLA, Jenkins, JIRA.

EXPERIENCE

Machine Learning Research Intern, BCAI Robert Bosch LLC ,USA

May 2022 - Present

Physically Realizable Adversarial Attacks on Autonomous F1Tenth Car, mentors: Wan-Yi Lin PhD, Joao Semedo, PhD

- Implemented targeted adversarial patch attacks on the camera data collected by the autonomous F1Tenth car.
- Developed and deployed physically realizable adversarial blackbox patch attacks on the Nvidia Jetson NX, tested in the real world office environment.
- Improved the performance of F1Tenth system by offloading the computation by creating a Gstreamer pipeline.

Software Developer, Reliance Industries Ltd

Jul 2018 - Jul 2020

- Developed a data engineering framework for big data management and for data services such as Ingestion, Transform and Consume, from data-lake.
- Reduced over 96 percent of the manual hours spent by data science team, by deploying an automated HQL query generator in Flask and integrated with Python REST API for access by other micro-services.
- Deployment and maintenance of the developed framework on production servers.

PROJECTS

Point Cloud Completion by Planar Reflective Symmetry Plane Detection

Python, CNN

- Detected the planar reflective plane of a symmetrical ShapeNet object by using unsupervised 3D CNN PRS-Net.
- Reconstructed missing point cloud data by geometrically mirroring along the found symmetry plane.

3D Object Detection using RGBD data for Autonomous Driving

Python, CNN

- Improved FrustumPointNets performance by modifying the architecture.
- Replaced Faster RCNN, used for 2D Bounding box estimation in baseline FrustumPointNets, with EfficientDet.

2D Object Detection for Autonomous Rovers

Python, Tensorflow, C++, ROS, Docker

- Deployed a real-time 2D Object Detection module based on an EfficientDet architecture that detects 11 objects with over 90 percent of test accuracy for classification on the simulation.

Simultaneous Localization and Mapping for Mobile Robots

C++, ROS, Gazebo

- Implemented 2D SLAM using a Particle Filter and Extended Kalman Filters by fusing data from wheel encoders, IMU, LiDAR and, an RGB-D camera for indoor environments, simulated in Gazebo with ROSbot2.0.

Computer Stereo Vision Algorithm Implementation on FPGA

Matlab, FPGA

- Incorporated SAD combined with DCT and adaptive window technique for generating disparity maps.
- Achieved an absolute average error/pixel of 5.11 by combining SAD using a varying window (AWDE), based on the mean absolute difference w.r.t centre pixel.

Motion Planning for Personalized Autonomous Driving

Python, Carla, C++

- Implemented second order Beizer curve as local planner with A* algorithm as the global planner.
- Performed left/right turn and overtaking tasks by Ego vehicle, by fine tuning of the control parameters of the Beizer curve.