

Neet Mehulkumar Mehta

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EDUCATION

Worcester Polytechnic Institute (WPI)

Master of Science- Robotics Engineering, GPA- 3.66/4.00

Worcester, MA

Dec 2022

Nirma University

Bachelors in Mechanical Engineering, GPA- 7.8/10.00

Ahmedabad, India

May 2020

KEY SKILLS

- **Programming Skills:** C++, Python, MATLAB
- **Tools and Libraries:** TensorFlow, Keras, Torch, ROS, Gazebo, OpenCV, CARLA simulator, Simscape, Simulink, Git, Solidworks, ANSYS, Blender 3D.

WORK EXPERIENCE

Institute for Plasma Research (IPR)

Research Intern

Gandhinagar, India

Jan 2020 – May 2020

- Developed a fully working model 5-DOF serial manipulator on an omnidirectional platform for inspection of Tokamak reactor that can be controlled by VR setup.

RESEARCH EXPERIENCE

Cognitive Medical Technology (COMET) Lab, WPI

Modeling the Kinematics and Dynamics of Continuum robot using Machine Learning Techniques

Worcester, MA

Sept 2021 - Present

- Developed a deep neural network to model the complex and recursive kinematics and dynamics of continuum robot.
- Develop a LWPR (Locally-weighted projection regression) model and compare time complexity of algorithm with DNN.

PROJECTS

Real-time monocular vision-based SLAM with NVIDIA Jetson, CNN, and ROS

Sept 2021 – Present

- Study different CNN architectures and techniques for depth reconstruction from a single image.
- Implement FCNN architectures as a part of the RTAB-MAP vSLAM algorithm pipeline to estimate the position of the moving Jetson nano and build the 3D map of the unknown indoor environment.

Motion Forecasting for Autonomous Vehicles

Sept 2021 – Present

- Train and test a combined GANs and LSTM based architecture for trajectory prediction of self-driving cars on the Argoverse dataset.

Unscented Kalman Filter Highway Project

Sept 2021 – Present

- Implement an Unscented Kalman Filter to estimate the state of multiple cars on a highway using noisy lidar and radar measurements.
- Obtain RMSE values that are in the acceptable range.

Camera based 2D feature tracking

Sept 2021 – Present

- Load images, setting up data structures and putting everything into a ring buffer to optimize memory load.
- Integrate several keypoint detectors such as HARRIS, FAST, BRISK and SIFT and compare them with regard to number of keypoints and speed.
- Implement descriptor extraction and matching using brute force and also the FLANN approach.

Self-driving car simulation in CARLA simulator

Feb 2021 – May 2021

- Implemented lattice planning algorithms with Bezier curve primitive for turning the vehicle and overtaking in low traffic scenarios in the CARLA simulator using python API.
- Implemented Adaptive Cruise control (ACC) to an autonomous agent.
- Tuned the algorithm to get different curvature of the path.

Implementation and Visualization of Autonomous Robot Path Planning Algorithms

Feb 2021 – May 2021

- Implemented discrete and sampling-based algorithms such as A*, Weighted A*, Dijkstra, Probabilistic Road Map(PRM), Rapidly exploring Random Tree (RRT), RRT*, and Informed RRT* to navigate through obstacles in a 2D environment.

Design and Simulation of a Quadruped Robot in different gaits and environments

Feb 2021 – May 2021

- Developed Kinematic and Dynamic model of the quadruped using different approaches and implemented different gaiting sequences (eg: walk, trot, gallop).
- Developed control architecture for all the legs of the quadruped.

EXTRACURRICULAR ACTIVITIES

- **Teaching Assistant:** Assisted professor in organizing two graduate-level courses in Summer '21.
- **Publicity Volunteer:** Gathered the highest number of students from other universities for national level Tech-Fest 'Praveg '18.