Neet Mehulkumar Mehta

Worcester, MA | nmehta@wpi.edu | +1 (774) 253 7865

EDUCATION

Worcester Polytechnic Institute (WPI) — **Worcester, MA**
Master of Science- Robotics Engineering, GPA- 3.66/4.00 — Dec 2022

Nirma University — **Ahmedabad, India**
Bachelors in Mechanical Engineering, GPA- 7.8/10.00 — May 2020

KEY SKILLS

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

WORK EXPERIENCE

Institute for Plasma Research (IPR) — **Gandhinagar, India**
Research Intern — 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 — **Worcester, MA**
Modeling the Kinematics and Dynamics of Continuum robot using Machine Learning Techniques — 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 (Deep Learning) — Sept 2021 – Present

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

Obstacle detection using LiDAR — Sept 2021 – Oct 2021

- Used Point Cloud Data to detect Obstcales.

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 ADAS system in CARLA simulator.
- 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.