**Neet Mehulkumar Mehta**

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**EDUCATION**

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| **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**

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| **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**

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| **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**

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| **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.