

# Neet Mehulkumar Mehta

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## EDUCATION

### Worcester Polytechnic Institute (WPI)

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

### Nirma University

Bachelors in Mechanical Engineering, GPA- 7.8/10.00

Worcester, MA

Dec 2022

Ahmedabad, India

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)

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 *C++, python*

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

Worcester, MA

Sept 2021 – Dec 2021

- 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

<b>Real-time monocular vision-based SLAM with NVIDIA Jetson, CNN, and ROS</b> <i>C++, Python, Tensorflow, OpenCV</i>	Dec 2021 – Present
<ul style="list-style-type: none"><li>• Study different CNN architectures and techniques for depth reconstruction from a single image.</li><li>• Implement FCNN architectures on TensorRT for faster inference and use it 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.</li></ul>	
<b>3D Object detection in Point Cloud using Voxel-RCNN</b> <i>Python, Pytorch, OpenCV</i>	Sept 2021 – Dec 2021
<ul style="list-style-type: none"><li>• Implement a 3D detection network (VoxelNet) on KITTI vision benchmark dataset to unify feature extraction and bounding box prediction into a single stage, end-to-end trainable deep network.</li></ul>	
<b>Real-time object following and gesture control with NVIDIA Jetson, CNN</b> <i>C++, Python, Tensorflow, OpenCV</i>	Sept 2021 – Dec 2021
<ul style="list-style-type: none"><li>• Implement hand-gesture recognition and hand-gesture control using CNN, ROS on Nvidia JetBot.</li><li>• Implement Object following feature on Nvidia JetBot.</li></ul>	
<b>Real-time hand gesture recognition using SSD-MobileNet and Transfer Learning</b> <i>Python, Tensorflow, OpenCV</i>	Oct 2021– Dec 2021
<ul style="list-style-type: none"><li>• Trained object detection model consisting of 5gestures by Transfer Learning to a pre-trained SSD-MobileNet model and TensorFlow object detection API on RTX 2060 MAX-Q GPU .</li><li>• Achieved 80% accuracy for a class.</li><li>• Trained lightweight model suitable for real time hand gesture recognition.</li></ul>	
<b>Self-driving car simulation in CARLA simulator</b> <i>Python, CARLA</i>	Feb 2021 – May 2021
<ul style="list-style-type: none"><li>• Implemented ADAS system in CARLA simulator.</li><li>• 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.</li><li>• Implemented Adaptive Cruise control (ACC) to an autonomous agent.</li><li>• Tuned the algorithm to get different curvature of the path.</li></ul>	

<b>Implementation and Visualization of Autonomous Robot Path Planning Algorithms</b> <i>Python</i>	Feb 2021 – May 2021
<ul style="list-style-type: none"> <li>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.</li> </ul>	
<b>Design and Simulation of a Quadruped Robot in different gaits and environments</b> <i>SimMechanics</i>	Feb 2021 – May 2021
<ul style="list-style-type: none"> <li>Developed Kinematic and Dynamic model of the quadruped using different approaches and implemented different gaiting sequences (eg: walk, trot, gallop).</li> <li>Developed control architecture for all the legs of the quadruped.</li> </ul>	

## 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.