**Neet Mehulkumar Mehta**

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**EDUCATION**

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| **Worcester Polytechnic Institute (WPI)** | **Worcester, MA** |
| Master of Science- Robotics Engineering, GPA- 3.85/4.00 | Dec 2022 |
| **Nirma University** | **Ahmedabad, India** |
| Bachelor’s in mechanical engineering, GPA- 7.8/10.00 | May 2020 |

**KEY SKILLS**

* **Programming Skills**: C++, Python, MATLAB
* **Tools and Libraries**: Pytorch, TensorFlow, TensorRT, Machine learning on cloud with AWS Sagemaker, AWS airflow, PCL (Point Cloud Library) Docker, Git, ROS, Gazebo, OpenCV, CARLA simulator, Blender 3D.

**WORK EXPERIENCE**

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| **TORC Robotics**  **Perception Engineer – Co-Op**  *C++, Python, Pytorch, AWS, TensorRT, PCL* | **Blacksburg, VA**  Jan 2022 – August 2022 |
| * Developed Multitask learning network to predict Instance and semantic masks and depth. * Developed novel self-supervised depth estimation network that can be used in multitask learning. * Worked on Data extraction and data postprocessing for deep learning architectures. |  |
| **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** *C++, python, MATLAB* | **Worcester, MA** | |
| **Modeling the Kinematics and Dynamics of Continuum robot using Machine Learning Techniques** | | 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**

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| **Vehicle Trajectory Prediction using Social GANs and LSTMs**  *Python, Pytorch* | August 2022 – Present |
| * Implementing Social GANs and LSTMs on Argoverse Motion Forecasting dataset. * Predict multiple socially plausible futures by training adversarially against a recurrent discriminator | |
| **Self-Supervised Monocular Depth Estimation (Monodepth2) from scratch**  *Python, Pytorch* | June 2022 – July 2022 |
| * Implemented Deep CNN architecture that can predict Depth without any annotations on KITTI raw dataset. * This architecture can be trained without any ground truth annotation. * Able to achieve absolute error of 0.151. | |
| **Multinet-2: A Multitask learning architecture for Semantic, Depth, and Normal prediction**  *Python, Pytorch* | Feb 2022 – May 2022 |
| * Implemented Deep CNN architecture that can predict Semantic mask, estimate Depth and normal simultaneously. * Increased combined inference speed to 1.75x with slight accuracy drop. | |
| **3D Object detection in Point Cloud using Voxel-RCNN**  *Python, Pytorch, OpenCV* | Sept 2021 – Dec 2021 |
| * Implement a 3D detection network (VoxelNet) on KITTI vision (Point Cloud) benchmark dataset to unify feature extraction and bounding box prediction into a single stage, end-to-end trainable deep network. | |
| **Real-time hand gesture recognition using SSD-MobileNet and Transfer Learning**  *Python, Tensorflow, OpenCV* | Oct 2021– Dec 2021 |
| * 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. * Achieved 80% accuracy for a class. * Trained lightweight model suitable for real time hand gesture recognition. | |
| **Real-time object following and gesture control with NVIDIA Jetson, CNN**  *C++, Python, Tensorflow, OpenCV* | Sept 2021 – Dec 2021 |
| * Implement hand-gesture recognition and hand-gesture control using CNN, ROS on Nvidia JetBot. * Implement Object following feature on Nvidia JetBot. | |
| **Popular CNN architectures**  **Python, Pytorch, Tensorflow** | Jan 2022 - present |
| * Implementing popular Deep Learning architecture like Alexnet, VGG, YOLO family, FCN, ICNET for Computer Vision. * Purpose of this projects are to develop a strong foundation of theoretical and practical aspect of Deep Learning. * You can find all the projects on my GitHub. Some of them might still be in development. | |
| **Self-driving car simulation in CARLA simulator**  *Python, CARLA* | 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**  *Python* | 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** *SimMechanics* | Feb 2021 – May 2021 |
| * Developed Kinematic and Dynamic model of the quadruped using different approaches and implemented different gaiting sequences (e.g.: 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.