# Neet Mehulkumar Mehta

Worcester, MA | nmehta@wpi.edu | +1 (774) 253 7865 | GitHub: https://github.com/neetmehta
Website: neetmehta.github.io

## EDUCATION

**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, CARLA simulator, Machine learning on cloud with AWS Sagemaker, Apache airflow, PCL (Point Cloud Library), OpenCV, ROS, Docker, Git, Blender 3D.

## WORK EXPERIENCE

**TORC Robotics** **Blacksburg, VA**
**Perception Engineer – Co-Op** Jan 2022 – Aug 2022
*C++, Python, Pytorch, AWS, TensorRT, PCL*

- 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)** **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** *C++, python, MATLAB* **Worcester, MA**
**Modeling the Kinematics and Dynamics of Continuum robot using Machine Learning Techniques** Sept 2021 – Dec 2021

- Implemented a LWPR (Locally weighted projection regression) algorithm to model the complex and recursive kinematics and dynamics of continuum robot.
- Developed a deep neural network for the same and compared the time complexity of both algorithms.

## PROJECTS

**Vehicle Trajectory Prediction using Social GANs and LSTMs** Aug 2022 – Present
*Python, Pytorch*

- Implementing Social GANs and LSTMs on Argoverse Motion Forecasting dataset.
- Predict multiple socially plausible futures by training adversarially against a recurrent discriminator.

**Self-driving car simulation in CARLA simulator** Aug 2022 – Present
*Python, Pytorch, CARLA*

- Implementing perception stack using Deep learning.
- Implementing ADAS system from scratch 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.

**Self-Supervised Monocular Depth Estimation (Monodepth2) from scratch** June 2022 – July 2022
*Python, Pytorch*

- 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** Feb 2022 – May 2022
*Python, Pytorch*

- 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** Sept 2021 – Dec 2021

*Python, Pytorch, OpenCV*

- 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** Oct 2021– Dec 2021

*Python, Tensorflow, OpenCV*

- 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.

**Popular CNN architectures**

*Python, Pytorch*

Jan 2022 - present

- Implementing popular Deep Learning architecture like Alexnet, VGG, ResNet, 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.

**Implementation and Visualization of Autonomous Robot Path Planning Algorithms** Feb 2021 – May 2021

*Python*

- 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.

## 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.