

Neet Mehulkumar Mehta

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EDUCATION

Worcester Polytechnic Institute (WPI)

Master of Science- Robotics Engineering, GPA- 3.85/4.00

Nirma University

Bachelor's 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:** 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

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

Cognitive Medical Technology (COMET) Lab, WPI

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

C++, python, MATLAB

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

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

Sept 2021 – Dec 2021

C++, Python, Tensorflow, OpenCV

- 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

Feb 2021 – May 2021

Python, CARLA

- 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

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.

Design and Simulation of a Quadruped Robot in different gaits and environments

Feb 2021 – May 2021

SimMechanics

- 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.