Neet Mehulkumar Mehta

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

- Developing Multitask learning network to predict Instance and semantic masks and depth.
- Developing novel self-supervised depth estimation network that can be used in multitask learning.
- Working on Data extraction and data postprocessing for deep learning architectures.
- Working on Active Learning (Deep learning) algorithm to determine images that models are most uncertain of.

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

- 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

Multinet-2: A Multitask learning architecture for Semantic, Depth, and Normal prediction   Feb 2022 – May 2022
Python, Pytorch

- Implemented novel 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.

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
Jan 2022 - present

Python, Pytorch, Tensorflow

- 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.