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++, CUDA, Python, MATLAB
- **Tools and Libraries**:   ROS2, Pytorch, TensorRT, CARLA simulator, AWS, PCL (Point Cloud Library), OpenCV, Docker, Git, Blender 3D, Solidworks.

WORK EXPERIENCE

TORC Robotics   **Austin, TX**
ML Engineer II   Feb 2023 – Feb 2025
C++, CUDA, ROS2, Python, Pytorch, AWS, TensorRT

- Developed learned Multisensor Multimodal fusion model, fusing LiDAR and camera sensor data to provide rich 3D Bird's Eye View features for downstream tasks like 3D object detection and lane line detection.
- Developed an automated conversion pipeline to transform PyTorch models to TensorRT, achieving a remarkable 3.7x performance acceleration in inference speed.
- Implemented advanced performance optimization techniques, further improving model efficiency by 2x through custom algorithmic refinements.
- Designed and implemented custom CUDA kernels for critical computer vision operations, including Non-Maximum Suppression (NMS), bounding box decoding, and voxelization, demonstrating deep expertise in low-level GPU computing.
- Successfully integrated the advanced object detection model into a proprietary Inference Engine, creating a robust abstraction layer for seamless deployment on embedded devices.
- Developed a highly versatile and configurable ROS2 node capable of dynamically handling diverse sensor combinations (LiDAR and camera), showcasing flexibility in sensor fusion and robotics software architecture.

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

- Developed a Multitask learning network to predict Instance and semantic masks and depth. Reduced combined inference time by 20 ms.
- Developed a novel self-supervised depth estimation network that can be used in multitask learning. Trained architecture without any Ground truth data.
- Worked on Data extraction and data postprocessing for deep learning architectures. Established extendable pipeline to generate detailed metrics report for each Deep learning model.
- Developed automated hyperparameter tuning stage in AWS Sagemaker. Used Bayesian search to find optimal hyperparameters.

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

PROJECTS

Synthetic Data Generation for Self Driving Cars using CARLA simulator   Aug 2022 – Present
Python, Pytorch, CARLA
- Developed a highly adaptable synthetic data generation pipeline supporting arbitrary sensor configurations (LiDAR and camera), enabling advanced training for 2D/3D object detection, semantic segmentation, and monocular depth estimation.

Self-Supervised Monocular Depth Estimation (Monodepth2) from scratch   June 2022 – July 2022
Python, Pytorch
- Implemented from scratch a [self-supervised monocular depth estimation](#) CNN achieving 0.151 absolute error on KITTI dataset without ground truth annotations, leveraging PyTorch and innovative deep learning techniques.

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 a 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 the 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   Jan 2022 - present
Python, Pytorch
- Implementing popular Deep Learning architecture for 2D/3D object Detection, Semantic and Instance Segmentation, and Depth Estimation.
- The purpose of these projects is to develop a strong foundation of the theoretical and practical aspects 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.