

# SANDEEP N MENON

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## EXPERIENCE

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### Deep Learning Intern, Perception | Kodiak Robotics May – Sept 2023

- Designed and implemented a multi-modal deep learning network using Camera, Lidar, and Radar sensory data for ground height, lane, and obstacle estimation.
- Deployed inference engine to run 3D sparse convolutions and custom CUDA kernels under 30ms, 85% speedup from PyTorch. Facilitates fast model inference on onboard infrastructure of autonomous trucks.

### Deep Learning Research Engineer | Deepen AI Sept 2020 – Jul 2022

- Developed a 3D PointNet model for temporal smoothing of segmentation predictions over point cloud sequences, achieving a 20% mIoU improvement.
- Built a Sparse Point-Voxel CNN model for semantic segmentation of 3D point cloud sequences, boosting data annotation speed by 30% and obtaining a 76% mIoU score.
- Implemented 2D object-aware anchor-free tracking for auto-labeling, increasing labeling speed by 50%.
- Devised a targetless Camera-IMU and [stereo camera calibration](#) algorithm, reducing calibration time by 90% and achieving sub 1-degree error margin.
- Created on-demand GPU Virtual Machine allocation system saving up to 4000 USD/month for the company.

### Software Development Engineer II | Microsoft Jun 2018 – Sept 2020

- Co-authored new Machine Learning algorithm inspired by Random Forests to identify similar customer deals and opportunities in Dynamics 365's [Relationship Analytics](#); **received patent award**.
- Shipped [Dynamics 365 sales insights connector](#) in Power platforms managing 9 million monthly requests.

## PROJECTS

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### Video frame prediction and collision modeling using Deep Learning | PyTorch, WandB Mar - May 2023

- Leveraged self-supervision techniques with the SimVP model for future segmentation prediction in videos, winning 1<sup>st</sup> place in Prof. Yann LeCun's and Prof. Alfredo Canziani's Deep Learning class at NYU.
- Innovated a New Object Suppression (NOS) decision tree-based technique to rectify prediction errors.

### Federated Training System for Generative Adversarial Networks | PyTorch, Flower Oct - Dec 2022

- Designed a federated learning system to train Generative Adversarial Networks(GAN). GANs can be trained across dozens of devices without sharing their data.

### Asymmetric 3D Convolutions in Torchsparse | PyTorch Feb 2021

- Contributed Asymmetric 3D Convolutions implementation to [TorchSparse](#) library, managed by MIT HAN Lab.

### Removing noise from Optical Coherence Tomography (OCT) Images [CVIP 2020] Aug 2017 - May 2018

- Achieved Structural Similarity Index (SSIM) value of 96.7% for low noise images and 91.2% for high noise images, surpassing the state-of-the-art results.

## TECHNICAL SKILLS

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**Deep Learning:** PyTorch, Tensorflow, TensorRT, Onnx, Keras, MMDet, PointNets, CNN, VAE, GAN

**Optimization:** CVXPY, Ceres, SciPy, NumPy

**Computer Vision:** OpenCV, LiDAR, SLAM, Multi-Sensor Calibration and Fusion, Depth Estimation

**Languages/Platforms:** C++, C#, Python, JavaScript, RUST, CUDA, OCamL, React, Redux, Django, LangChain, Flower, Bazel, Docker, Azure, ROS, ClearML, WandB, Google Cloud, MongoDB, RocksDB, MySQL, Git

## EDUCATION

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**New York University (NYU) Courant Institute of Mathematical Sciences 2022 – 2024**

Master of Science in Computer Science

**National Institute of Technology Karnataka, Surathkal, India (NITK) 2014 – 2018**

Bachelor of Technology in Computer Science