Omkar Ashok Chittar

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EDUCATION

University of Maryland, College Park   College Park , MD
Master of Engineering in Robotics — 3.96 CGPA   *Aug. 2022 – May 2024*

Savitribai Phule Pune University   Pune, India
Bachelor of Engineering in Mechanical   *July 2014 – June 2018*

TECHNICAL SKILLS

Languages: Python, C/C++, MATLAB, SQL, R
Developer Tools: Git, Docker, GCP, VS Code, Linux, ROS, OpenVINO, ONNX, Carla, Colab, AWS, Kubernetes
Libraries: PyTorch3D, pandas, NumPy, Matplotlib, PyTorch, Tensorflow, Keras, Scikit, OpenCV, PCL, PIL, OpenGL
Computer Vision Applications: 3D reconstruction, multi-view geometry, SfM/SLAM, Generative models, Object Detection & Tracking, Semantic Segmentation, Inpainting, Depth Estimation, Point Cloud processing, Pose Estimation
Architectures: VGG16, ResNet, GANs, LSTM, VAE, Transformers, NeRF, Diffusion Models, RNN, RCNN, ViT

WORK EXPERIENCE

Computer Vision Engineer   June 2019 – June 2022
Sakar Robotics   *Pune, India*

- Initiated vehicle detection and identification advancements using YOLO and DeepSORT, achieving a 20x increase in model inference speed through lossless quantization and deployment optimizations
- Employed optical flow algorithms for improved motion vector analysis, enhancing tracking performance
- Led enhancement of localization and navigation systems, integrating Normal Distribution Transform for localization and GPS/IMU fusion with Kalman filters, boosting mapping accuracy by 20% and efficiency by 50%
- Oversaw C++ driver development for GPS modules and optimized velocity estimation, reducing noise by 40%
- Deployed Siamese neural networks for face recognition, showcasing skill in model optimization with OpenVINO and PyTorch, and integrated PyTorch models into C++ environments, demonstrating programming versatility

Project Intern   Jan. 2018 – Jan. 2019
DRDO   *Pune, India*

- Developed an active exoskeleton for assisting humans while lifting heavy loads, achieving 95% gait anomaly detection accuracy with PoseNet and LSTM networks, enhancing load support by 30%
- Conducted 100+ trials, significantly improving exoskeleton design and efficiency, and streamlined data processing by 40%, speeding up rehabilitation and task support adjustments

PROJECTS

Super pixel generation using SLIC and Image Segmentation | *PyTorch*   GitHub
- Performed image segmentation using superpixels generated with SLIC algorithm and k-means clustering, resulting in 95% accuracy with the VGG16 architecture

Point Cloud Classification and Segmentation | *PyTorch3D, Python*   GitHub
- Implemented PointNET architecture for classification amongst three classes and segmentation of different parts of the point clouds, achieving 97% accuracy for classification and 90% for segmentation

NeRF++ | *PyTorch*   GitHub
- Implemented NeRF++ to synthesize novel views of a scene from a set of input images, which makes use of two NeRF models: one for the background using inverse spherical coordinates and another for the foreground

Single View to 3D Reconstruction | *PyTorch3D, Python*   GitHub
- Innovated a system using the Pix2Vox model for reconstructing voxel grids from 2D RGB images and the PointNetFCAE model for reconstructing 3D point clouds and meshes
- Attained an average F1 score of 54.37 for voxels, 86.92 for point clouds and 73.15 for meshes

Object Detection and Tracking for Autonomous Driving | *Python, TensorFlow, PyTorch*   GitHub
- Engineered a state-of-the-art system for autonomous driving applications, integrating U-Net architecture for precise pixel-level semantic segmentation and employing YOLOv8/YOLOv3 for swift and accurate object detection
- Leveraged Kaggle datasets for comprehensive training and validation, achieving segmentation training accuracy of 98.02% and validation accuracy of 97.78%