

NAVODIT CHANDRA

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EDUCATION

Carnegie Mellon University, College of Engineering Master of Science Specialization in AI and Robotics GPA: 3.97/4.00 <i>Selected Coursework:</i> Machine Learning and Artificial Intelligence, Deep Learning, Computer Vision, Trustworthy AI Autonomy	Pittsburgh, USA Dec 2022
Indian Institute of Technology Kanpur Major in Mechanical Engineering Minor in Electrical Engineering GPA: 9.1/10.0	Kanpur, India May 2021

WORK EXPERIENCE

Qualcomm Computer Vision Systems Engineer	Hyderabad, India June 2023 - Present
<ul style="list-style-type: none">Developed an algorithm for rendering shallow depth of field effects on an all-in-focus video stream using classical computer visionDeveloped a convolutional neural network architecture for depth estimation from a single image suitable for meeting real-time requirementsImplementing quantization techniques on a deep learning model for optical-flow	

SKILLS

Programming Languages: *Proficient:* Python, C++, *Familiar:* SQL, Java, HTML
Libraries: PyTorch, OpenCV, Gym, NumPy, Pandas, Matplotlib, Scikit-learn
Software and Tools: Linux (Ubuntu), CARLA, MATLAB, MAPLE, Arduino, Git

RESEARCH EXPERIENCE

Carnegie Mellon University <i>Graduate Researcher, Mechanical and Artificial Intelligence Lab</i>	Pittsburgh, USA May 2022 - Dec 2022
<ul style="list-style-type: none">Generated a dataset consisting of RGB images and LIDAR point cloud in autopilot mode on CARLA simulatorRefined image and point cloud feature maps processed by ResNet neural network architecture by introducing Convolutional Block Attention ModuleImproved Driving Score evaluation metric by 9.5% by implementing Additive Attention for computation of alignment scores in transformer block used to combine intermediate image and LiDAR feature mapsExperimented model performance in simulation by replacing Self-Attention module with Cross-Attention module	

RELEVANT PROJECTS

End to End Learning for Self-Driving Cars	Feb 2022 - Apr 2022
<ul style="list-style-type: none">Predicted steering angle of a self-driving car from images captured by it by developing an end-to-end learning pipelineAccomplished reasonably good performance on training and testing tracks by executing CNN and CNN-LSTM neural network topologies in a team of 2	
Modeling and Study of Adversarial Attacks Arising from Deceiving Perception in Car Autopilot	Feb 2022 - Apr 2022
<ul style="list-style-type: none">Collaborated in a team of 3 and simulated a real-life incident of tricking a self-driving car to misidentify moon as a yellow traffic light deploying a targeted adversarial attack algorithmExecuted PGD algorithm to trick autopilot system and carried out adversarial training as an effective adversarial defensive technique to avert such safety-critical scenarios	
Seven Segment Digit Recognition using Computer Vision	Mar 2022 - Apr 2022
<ul style="list-style-type: none">Collaborated with 2 colleagues and developed an algorithm to take readings from devices using seven-segment displayEnhanced accuracy by 7.8% and speeded up process of taking readings by 10.4 times in comparison to average computer typists by utilizing image processing operations and computer vision techniques	
Depth Estimation leveraging Stereo Vision and Generation of 3D Point Cloud	Mar 2022 - Apr 2022
<ul style="list-style-type: none">Found depth of pixels from disparity map produced by pair of parallel stereo images to compute distance of objectsGenerated a 3D point cloud for visualization and verification of correctness of scaling ratio used to find depth	
Edge Detection	Apr 2022 - Apr 2022
<ul style="list-style-type: none">Detected edges in images by implementing a Sobel filter from scratch and applying Canny edge detection with increased performance by tuning parameters	
Semantic Segmentation for Drivable Area Detection	May 2022 - May 2022
<ul style="list-style-type: none">Applied semantic segmentation on BDD100k dataset for detection of drivable area and adjacent laneImplemented DeepLabv3+ neural network architecture involving a combination of spatial pyramid pooling and encoder decoder structure for enhanced performance	
Identification of Abnormal Breasts as Potential Cancers using Machine Learning	Oct 2021 - Dec 2021
<ul style="list-style-type: none">Applied feature engineering leveraging shallow machine learning classification algorithms in a joint effort with 2 colleagues to estimate minimum number of features to predict whether tumors were malignant or benign	