ADITYA VAISHAMPAYAN

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PROFESSONAL EXPERIENCE:

Computer Vision Engineer - Intern (SimInsights Inc., Lake Forest, CA) **July 2020 – Present**

- Using Isaac Sim Unity 3D Engine for synthetic data generation on novel objects, and Isaac SDK for DetectNetV2, YOLOV3 architectures to perform object detection on real life objects obtaining mAP of 95%.
- Researching on reducing the synthetic to real gap using domain randomization for object detection and pose estimation.
- Working on a pipeline in C++ to detect and track a 3D object in point cloud using Azure Kinect sensor.
- Implementing a Data Version Control pipeline using Amazon S3 and Git for sharing data and model files across all users.
- Researched various techniques to implement Few Shot Object Detection, using FasterRCNN and PyTorch.
- Helping with data annotation and general scripting in python and C#.

Robotics and Control Engineer - Intern (Tesla Inc., Fremont, CA) **June 2019 – August 2019**

- Researched and implemented from scratch a Continuous Integration and Continuous Delivery (CI/CD) pipeline for FANUC industrial robots, following software development cycle.
- Developed features such as trigger based code backup, remote code push, static analyzer, control flow for the pipeline.
- Performed thorough research for the project of teach pendent-less robot programming. Onboarded a new vendor and orchestrated the project with them for deployment.
- Initiated virtual commissioning for auto-trimming Tesla solar panels, using a FANUC robot in Process Simulate.

TECHNICAL SKILLS:

Programming:	Python, C++, C#, KRL (Kuka Robot Language), IEC 61131 (Ladder Logic and STL)
Frameworks and Libraries:	Nvidia Isaac SDK, Unity3D Engine, PyTorch, TensorFlow, Keras, OpenCV, PCL, Scikit Learn, Pandas, Matplotlib, NumPy, ROS, Gazebo, V-REP, Rviz, GIT, MATLAB, Simulink Control Systems and Robotics System Toolbox

RESEARCH EXPERIENCE & PROJECTS:

Unsupervised Learning for Monocular Depth Estimation | TensorFlow

- Estimated depth map and camera pose (or ego-motion) from a sequence of 2D images using unsupervised learning.
- Learned rotation and translation from the sequence of images obtain from KITTI dataset by generating disparity maps using photometric reconstruction loss.

DepthSegNet - Monocular Depth estimation and Semantic Segmentation | GCP, TensorFlow, OpenCV

- Created a Convolution Neural network with parallel pipelines for depth estimation and semantic segmentation.
- Performed two stage training on the network. Initially trained the depth network using stereo images, and then separately trained segmentation decoder.
- Used Cityscape dataset, TensorFlow and Google cloud platform for training to obtain a mean IoU of 0.64.

AutoPano - Deep Homography Net, Supervised and Unsupervised | OpenCV, Keras, TensorFlow

- Implemented a deep CNN to learn homography using TensorFlow with a custom-built dataset based on MS COCO thus generating a panorama using image stitching.
- Performed the same task with an unsupervised homography net using TensorDLT and Spatial Transformer Network.

EDUCATION:

Master of Engineering in Robotics **Aug 2018 - May 2020**
University of Maryland, College Park, MD
Bachelors in Instrumentation and Control Engineering **Aug 2014 - May 2018**
L.D. College of Engineering, Ahmedabad, India

Coursework: Statistical Pattern Recognition, Pictorial Information Processing, Deep Learning, Advance Techniques in Visual Learning and Recognition, Perception and Planning for Autonomous Robots