ADITYA VAISHAMPAYAN

Phone: (240) 743-0530 aditya1.vaishampayan@gmail.com
https://adityavaishampayan.github.io **www.linkedin.com/in/aditya-vaishampayan**

PROFESSONAL EXPERIENCE:

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

- Working on Nvidia Jetson Nano as edge inference device for human activity recognition tasks.
- Using Isaac Sim Unity 3D Engine for synthetic data generation on novel objects, and DetectNetV2, YOLOV3 architectures to perform object detection on real life objects obtaining mAP of 95%.
- Estimating 6 DOF pose of real-world objects by solely training the pose network on synthetic data getting mAP of 89%.
- Implemented domain randomization to reduce the synthetic to real gap while generating synthetic dataset in Unity.
- Developing a pipeline in C++ to detect pose, thus tracking a 3D object in point cloud using Azure Kinect RGB-D camera.
- Implemented 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.

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.

CERTIFICATION:

Fundamentals of Accelerated Computing with CUDA C/C++ (Nvidia) September 2020

TECHNICAL SKILLS:

Frameworks and Libraries: Nvidia Isaac SDK, Nvidia DeepStream, 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

Programming: Python, C++, C#, KRL (Kuka Robot Language), IEC 61131 (Ladder Logic and STL)

RESEARCH EXPERIENCE & PROJECTS:

Unsupervised Learning for Monocular Depth Estimation | TensorFlow, Python

- 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.

Building a building in Minutes | 3D reconstruction, Structure-from-motion, OpenCV

- 3D reconstruction of a structure from a given dataset of 2D RGB images obtained through a monocular camera.
- Implemented RANSAC based outlier rejection, PnP Estimation, Bundle Adjustment, and 3-D Triangulation algorithms.

Object Tracking in 3D Space | C++, OpenCV, PCL, Sensor Fusion

- Developed a pipeline to match 3D objects using key point correspondences and computed time to collision using Lidar.
- Project lidar points backward onto a camera image to fuse sensor modalities. Used YOLO framework on the fused data for detecting and classifying objects and track vehicles.

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