ADITYA VAISHAMPAYAN

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PROFESSONAL EXPERIENCE:

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++, KRL (Kuka Robot Language), IEC 61131 (Ladder Logic and STL)
Frameworks and Libraries:	OpenCV, TensorFlow, Keras, 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.

Face Swap (Snapchat Filter) | OpenCV, Dlib, TensorFlow

- Created an end to end pipeline to swap faces in a video like Snapchat's face swap filter.
- Implemented a joint 3D face reconstruction and dense alignment network with position map regression.
- Also, implemented a classical computer vision pipeline using Delaunay Triangulation, Thin Plate Splines.

Image Classification on Fashion-MNIST, CIFAR 10 dataset | ScikitLearn, TensorFlow, python

- Implemented maximum likelihood estimation with Gaussian assumption followed by Bayes rule for classification.
- Applied PCA, LDA for dimensionality reduction, and then classified the images using KNN, and SVM.
- Implemented LeNet, VGGNet and ResNet, ResNext architectures using TensorFlow.

Traffic Sign Detection and Classification | ScikitLearn, Keras, OpenCV, Python

- Detected traffic signs from a video using MSER, Histogram of Gradients (HOG) features and trained a Support Vector Machine (SVM) for classification purposes using Scikit-learn.
- Created bounding boxes around the detected sign and pasted the appropriate sign next to it for verification.

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