Explanation Document

Github Repo URL - Hoshali2000/ShopLifting (github.com)

1. **Models Used –**

   For this assignment I have used two models that are –

   a. Object Detection – ssd_mobilenet_v3_large_coco_2020_01_14 from Tensorflow, imported in OpenCV to identify 'Person' in video.

   b. Pose Detection – OpenPose, imported in OpenCV to detect poses in video

The main.py scripts starts with importing the necessary packages and then does the following steps –

a. Opens provided input video.
b. Initialises Object Detection model by importing the model's .pb and .pbtext file
c. Initialises Pose Detection model by importing it's .pb file.
d. Run an infinite while loop, that breaks on pressing 'q'
e. Extract frame from video using opencv's built-in functions
f. Run the Object Detection and Pose Detection model on the frames and draw necessary shapes and texts on the video to check the detection and perform further actions on it.
g. Save the frame to a new video
h. On pressing 'q', save the output video and close all the windows

2. **Datasets used –**

   Both the models used are pre-trained models, the MobileNet & OpenPose models that are being used to detect 'person' and it's 'pose' are trained in coco dataset that is industry staple for these kinds of tasks.

3. **Why I have used this –**

My approach to the problem was to first identify the person and then their activity, to do this I had to figure out a way to detect objects in video. While my research for the task I came across MobileNet, a model that is very good, fast and accurate in identifying objects. Then, I used OpenPose to get information on Pose as this model is also accurate and fast making it fit for getting live information from the video.

4. References –

- quanhua92/human-pose-estimation-opencv: Perform Human Pose Estimation in OpenCV Using OpenPose MobileNet (github.com)
- A 2019 guide to Human Pose Estimation with Deep Learning (nanonets.com)
- Object Detection | TensorFlow Hub