

Pothole Detector

Object Detection Network using PyTorch. SSD-MobileNet is the architecture that is used in this project.

Google Drive (Project Pothole Detector):

<https://drive.google.com/drive/folders/1bG8eG7QQg0LQ9yZx600o7TfTHGsw8wM7?usp=sharing>

Steps in completing the project:

1. Run a docker container and cd to jetson-inference directory.

```
shafiqah@iqbal-desktop:~$ cd jetson-inference
shafiqah@iqbal-desktop:~/jetson-inference$ docker/run.sh
```

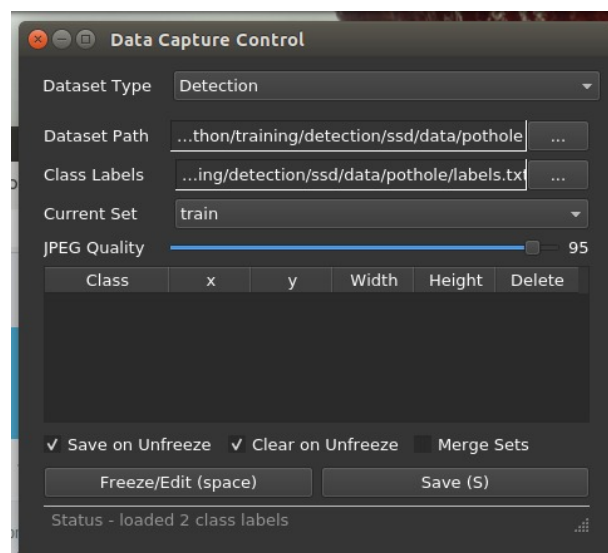
2. Use the docker run script and cd to python/training/detection/ssd. In this directory, all PyTorch scripts and utilities is located.

```
root@iqbal-desktop:~/jetson-inference# cd python/training/detection/ssd
root@iqbal-desktop:~/jetson-inference/python/training/detection/ssd#
```

3. Use camera-capture tool to capture the custom dataset. It has features to detect the datasets and bounding boxes as well.

```
root@iqbal-desktop:~/jetson-inference/python/training/detection/ssd# camera-capture /dev/video0
```

4. Change the Dataset Type in Data Capture Control to detection. Fill up the Dataset Path and Class Labels to its respective browser.



5. In the txt file, label pothole and obstacle.
6. Start capturing the data by click on Freeze/Edit button. Create the bounding box. The data will be saved automatically on Unfreeze.
7. Train the dataset.

```
root@iqbal-desktop:/jetson-inference/python/training/detection/ssd# python3 train_ssd.py --dataset-type=voc --data=data/pothole --model-dir=models/pothole --batch-size=2 --workers=1 --epochs=30
```

8. Export the trained dataset from PyTorch to onnx.

```
root@iqbal-desktop:/jetson-inference/python/training/detection/ssd# python3 onnx_export.py --model-dir=models/pothole
```

9. Test the data on the USB camera.

```
root@iqbal-desktop:/jetson-inference/python/training/detection/ssd# detectnet --model=models/pothole/ssd-mobilenet.onnx --labels=models/pothole/labels.txt --input-blob=input_0 --output-cvg=scores --output-bbox=boxes /dev/video0
```