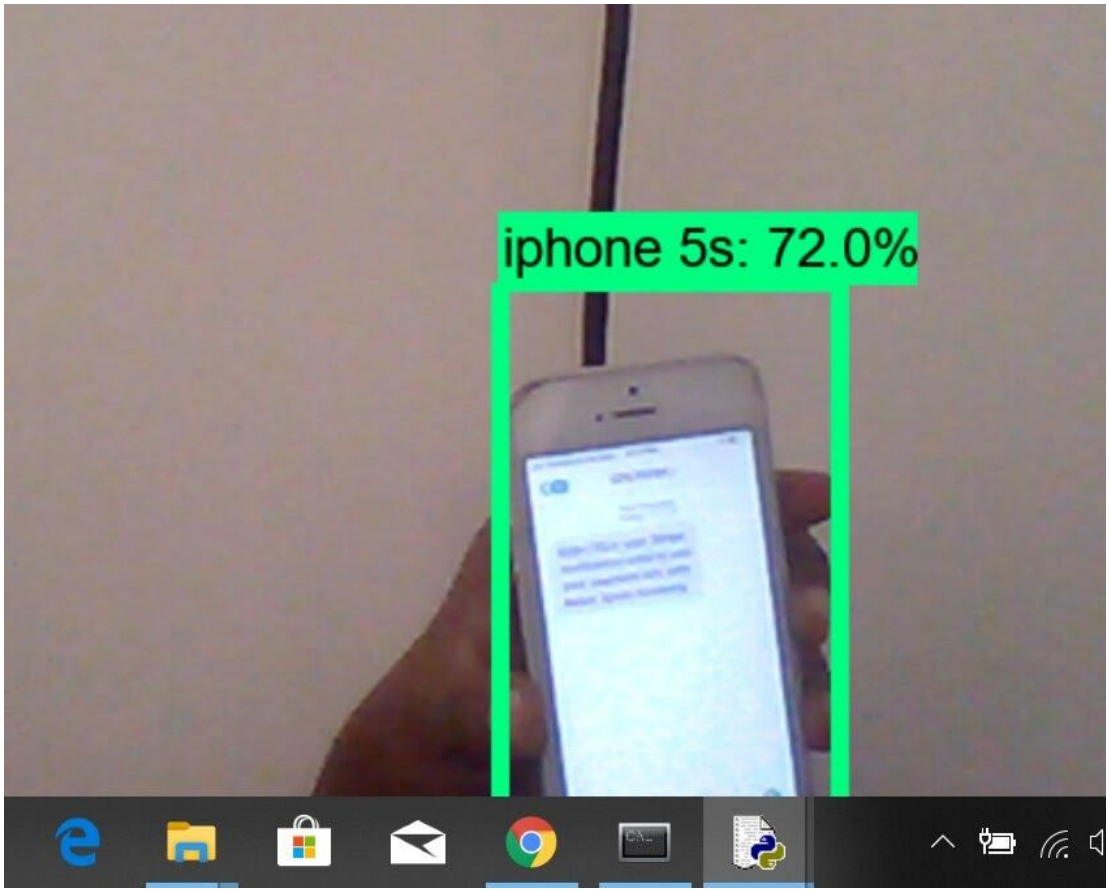
Train Tensorflow API To Detect Different Mobile Phone Models

This document describes how to train an object detection classifier to detect mobile phone models. I chose Tensorflow (https://www.tensorflow.org/)to create the object detection classifier. It is a deep Learning framework which can be run on computers of all kinds, even on smartphones and it's support for multiple languages. It's faster and more accurate than imageai and opencv.(I tried object detection with both too.That's why I concluded).



pic1.Object classifier detect Iphone 5s model

This object detection classifier is compatible for Windows 10 only.

Step1: Installation of Python IDE

I installed Anaconda Navigator(use installere 3.7).Tensorflow API requires Nvidia Gpus. But my PC has an AMD radeon. It won't support Nvidia. I installed an AMD supported gpu (https://www.amd.com/en/support).

Step2: Create Conda environment

We need to create an environment.For that,I create a folder named 'tensorflow2' in local disk C. But never create the new folder inside the Anaconda3/envs folder or it will create an error during running the module for this work.Then activate the tensorflow2 environment in anaconda prompt(Administrator mode).

Step3: Setup the environment

a.Add tensorflow API repository

Download tensorflow API models from https://github.com/tensorflow/models and add it into the tensorflow2 folder.

b.Add the model tree

Download the Faster-RCNN-Inception-V2-COCO model from TensorFlow's model zoo from https://github.com/tensorflow/models. Add the model tree into tensorflow2/model/research/object_detection folder.

Step4. Installation of Required Packages

1.pip install tensorflow-gpu==1.15.0

2.pip install tensorflow==1.15.0

I installed tensorflow==1.15.0 . Because they didn't upload the tensorflow API repository for the latest versions. Then I installed protobuf, pillow, Cython, lxml, contextlib2, jupyter, matplotlib, pandas and opencv-python.

Step5. PythonPath Setup

A PYTHONPATH variable must be created that points to the \models, \models\research, and \models\research\slim directories.Type following command.

(set

PYTHONPATH=C:\tensorflow2\models;C:\tensorflow2\models\research;C:\tensorflow2\models\research\slim).

Then compiled protobuf.Build and installed setup.py

Step6:Add modules for the object classifier

Download the module from

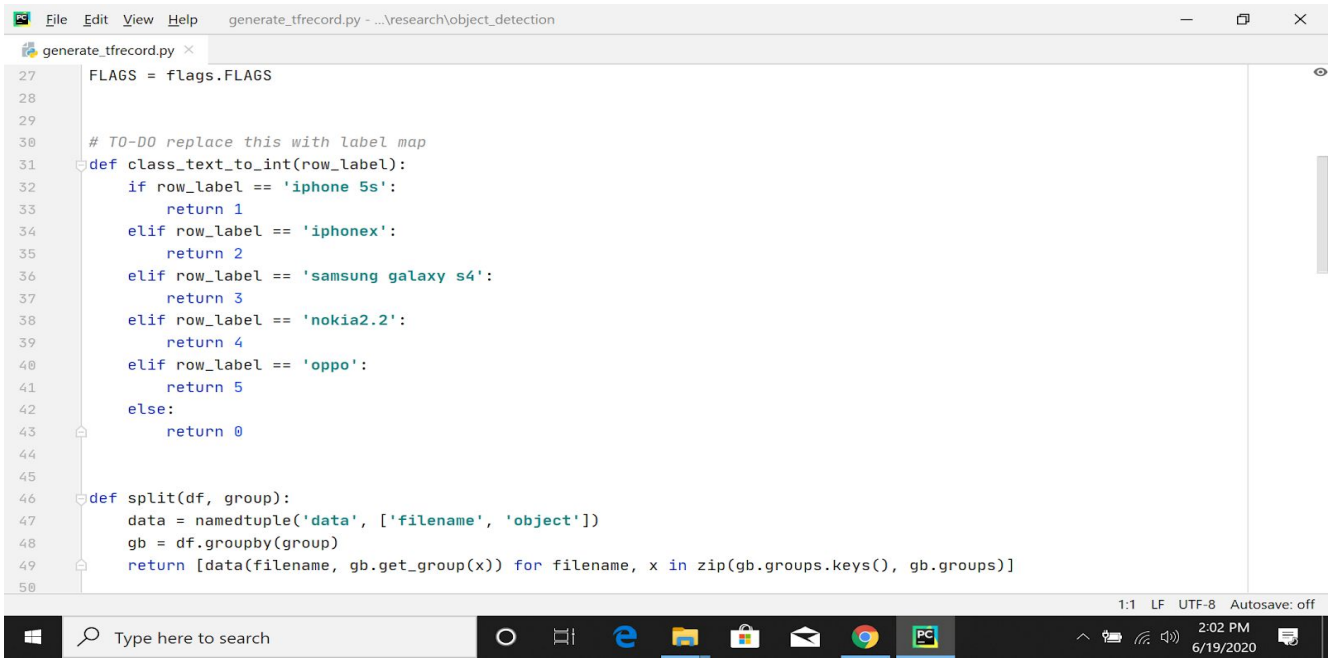
https://github.com/EdjeElectronics/TensorFlow-Object-Detection-API-Tutorial-Train-Multiple-Objects-Windows-10 and add to the object_detection folder.

Step7: Gather and Label Pictures

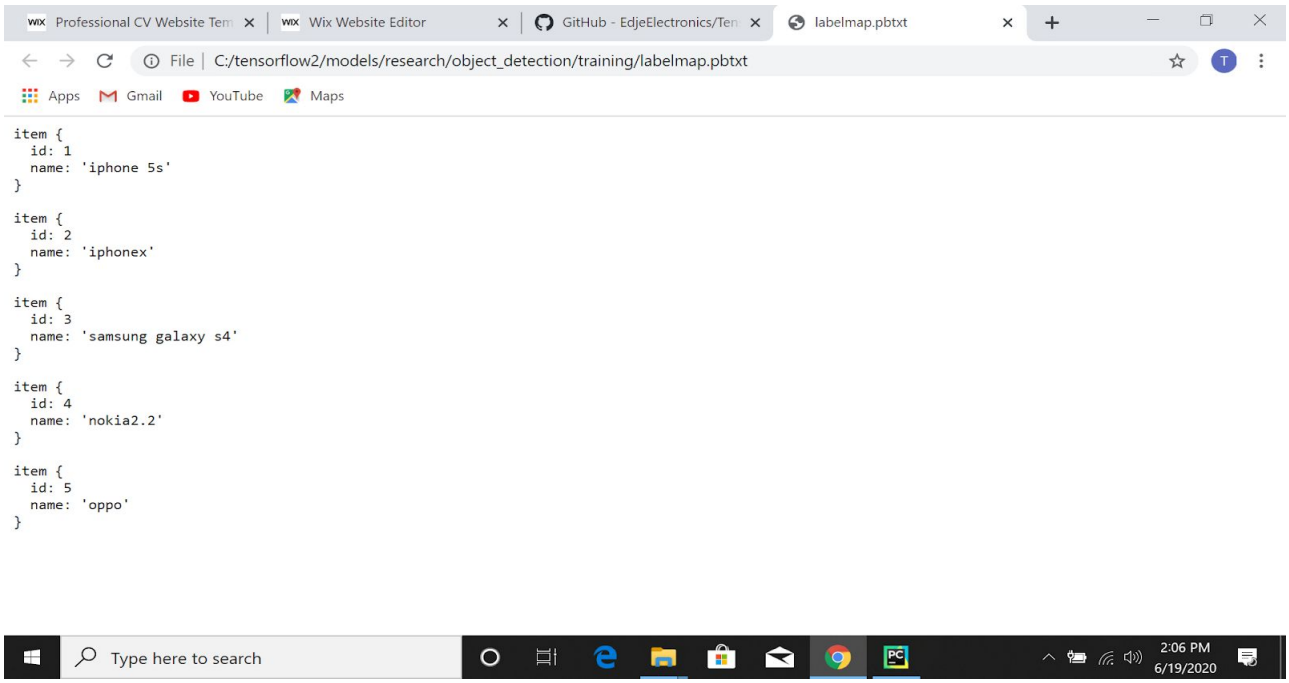
I gathered 120 images of Iphone 5s, Iphone x, Samsung Galaxy S4, Nokia2.2 and also added Oppo for my classifier.I split 20% images for testing and 80% for training.I labeled it as he mentioned and created csv files.

Step5: Generate TF Records and config file

a.modifying generate-tfrecord.py file:



b.Modifying labelmap.pbtxt



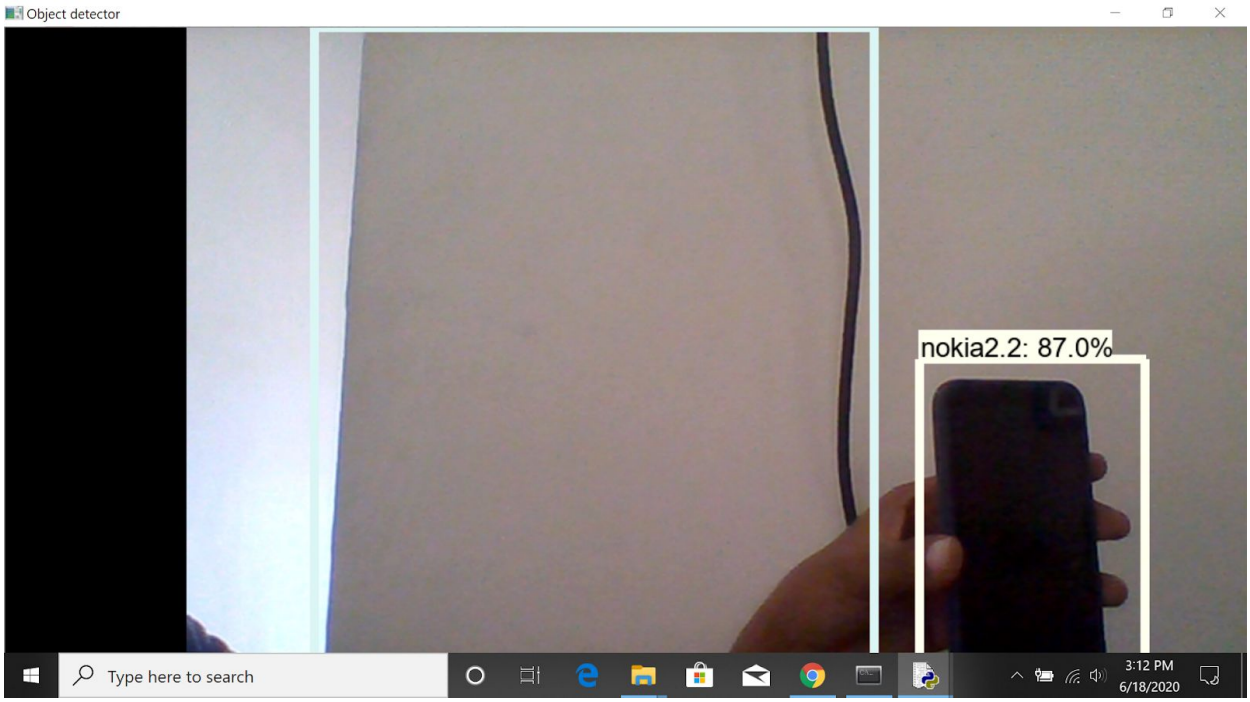
C. Configure training

Get faster_rcnn_inception_v2_pets.config from samples\configs folder. Modify it as num_classes in model dictionary as 35.Because,Number models,it's gonna detect five and also change the paths required in the train_input_reader and eval_input_reader dictionary based on the paths in my pc. Add faster_rcnn_inception_v2_pets.config file to training folder.

Step6: Run the Training

Tensorflow included model_main.py in the object_detection folder to train models after 1.9 version.I got errors using this module. So,copy train.py file from object_detection/legacy folder to object_detection folder and use it. It takes more than three hours to train.

Step7: Result of trained Classifier


Object detector
nokia2.2: 87.0%
Type here to search
3:12 PM
6/18/2020


samsung galaxy s4: 67.0%
3:15 PM
6/18/2020

I trained the model with only 120 images.It is not enough to train the model efficiently.That's why it is confused with models sometimes. It needs at least 200 images to get better results.