

VERZEO

Major Project

Detection of Wrinkles, dark spots and
puffy eyes

Project Done by

Batch 17

MANUAL

OBJECTIVE

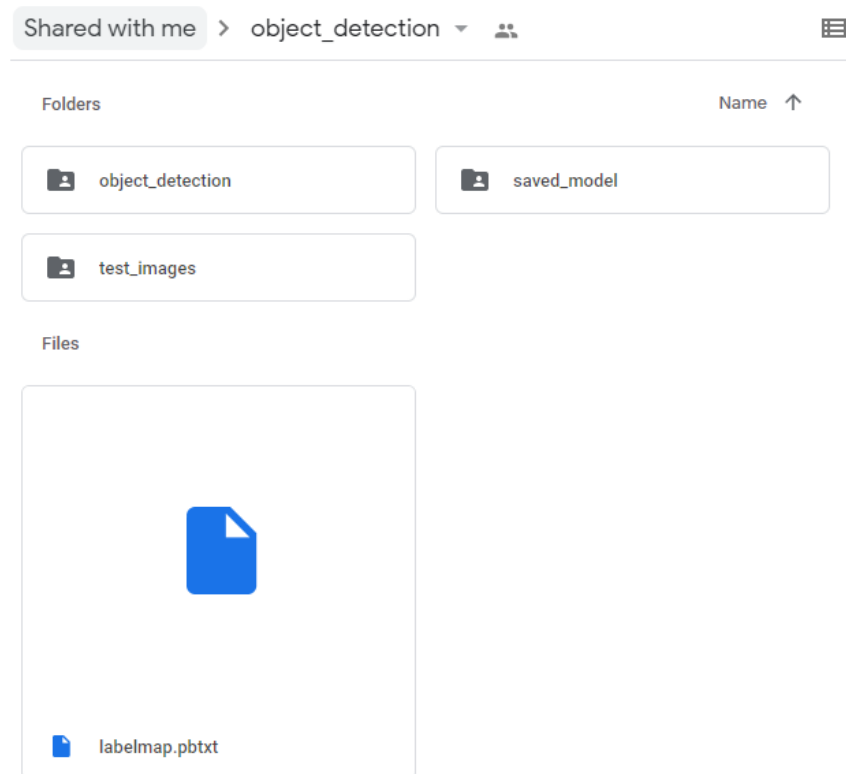
To build a Machine Learning model that localises and highlights the signs of ageing. Signs of ageing include Dark spots, wrinkles, puffy eyes, uneven skin tone, etc.

PROBLEM DESCRIPTION

Identification of potential signs of ageing – wrinkles, dark spots and wrinkles. Train model and find accuracy of the model.

INSTRUCTIONS

Upload the dataset(s) in your Google Drive.



Mount the drive

```
[ ] 1 from google.colab import drive
    2 drive.mount('/content/drive',force_remount=True')
```

Install necessary dependencies

```
[ ] 1 !pip install -U --pre tensorflow==2.*
    2 !pip install tf_slim

Requirement already up-to-date: tensorflow==2.* in /usr/local/lib/python3.7/dist-packages (2.5.0)
Requirement already satisfied, skipping upgrade: h5py==3.1.0 in /usr/local/lib/python3.7/dist-packages (from tensorflow==2.*) (3.1.0)
Requirement already satisfied, skipping upgrade: tensorboard==2.5 in /usr/local/lib/python3.7/dist-packages (from tensorflow==2.*) (2.5.0)
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Requirement already satisfied, skipping upgrade: google-pasta==0.2 in /usr/local/lib/python3.7/dist-packages (from tensorflow==2.*) (0.2.0)
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Requirement already satisfied, skipping upgrade: flatbuffers==1.12.0 in /usr/local/lib/python3.7/dist-packages (from tensorflow==2.*) (1.12)
Requirement already satisfied, skipping upgrade: keras-preprocessing==1.1.2 in /usr/local/lib/python3.7/dist-packages (from tensorflow==2.*) (1.1.2)
Requirement already satisfied, skipping upgrade: absl-py==0.10 in /usr/local/lib/python3.7/dist-packages (from tensorflow==2.*) (0.12.0)
Requirement already satisfied, skipping upgrade: astunparse==1.6.3 in /usr/local/lib/python3.7/dist-packages (from tensorflow==2.*) (1.6.3)
Requirement already satisfied, skipping upgrade: numpy==1.19.2 in /usr/local/lib/python3.7/dist-packages (from tensorflow==2.*) (1.19.5)
Requirement already satisfied, skipping upgrade: protobuf==3.12.1 in /usr/local/lib/python3.7/dist-packages (from tensorflow==2.*) (3.12.1)

[ ] 1 !pip install tensorflow-object-detection-api

Collecting tensorflow-object-detection-api
  Downloading https://files.pythonhosted.org/packages/4e/11/7f6d3c5c4b603cc40b2813059779afb641bd5eb68045c62ca520bfce0359/tensorflow_object_detection_api-0.1.1.1-583KB 5.2MB/s
Requirement already satisfied: Pillow==1.0 in /usr/local/lib/python3.7/dist-packages (from tensorflow-object-detection-api) (7.1.2)
Requirement already satisfied: Matplotlib==2.1 in /usr/local/lib/python3.7/dist-packages (from tensorflow-object-detection-api) (3.2.2)
Requirement already satisfied: Cython==0.28.1 in /usr/local/lib/python3.7/dist-packages (from tensorflow-object-detection-api) (0.29.23)
Requirement already satisfied: Protobuf in /usr/local/lib/python3.7/dist-packages (from tensorflow-object-detection-api) (3.12.4)
Requirement already satisfied: lxml in /usr/local/lib/python3.7/dist-packages (from tensorflow-object-detection-api) (4.2.6)
Requirement already satisfied: jupyter in /usr/local/lib/python3.7/dist-packages (from tensorflow-object-detection-api) (1.0.0)
Requirement already satisfied: tensorflow in /usr/local/lib/python3.7/dist-packages (from tensorflow-object-detection-api) (2.5.0)
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Requirement already satisfied: wheel in /usr/local/lib/python3.7/dist-packages (from tensorflow-object-detection-api) (0.36.2)
Collecting twine
  Downloading https://files.pythonhosted.org/packages/42/ad/713372978a8de58a43c507bf62b9c30c3d7b5cda4e972d563b881620a511/twine-3.4.1-py3-none-any.whl
Requirement already satisfied: cyclers==0.10 in /usr/local/lib/python3.7/dist-packages (from Matplotlib==2.1->tensorflow-object-detection-api) (0.10.0)
Requirement already satisfied: pyparsing==2.0.4,!=2.1.2,!=2.1.6,!=2.0.1 in /usr/local/lib/python3.7/dist-packages (from Matplotlib==2.1->tensorflow-object-detection-api) (2.8.1)
Requirement already satisfied: python-dateutil==2.1 in /usr/local/lib/python3.7/dist-packages (from Matplotlib==2.1->tensorflow-object-detection-api) (1.19.5)
Requirement already satisfied: kiwisolver==1.0.1 in /usr/local/lib/python3.7/dist-packages (from Matplotlib==2.1->tensorflow-object-detection-api) (1.3.1)
Requirement already satisfied: six==1.9 in /usr/local/lib/python3.7/dist-packages (from Protobuf->tensorflow-object-detection-api) (1.15.0)
Requirement already satisfied: setuptools in /usr/local/lib/python3.7/dist-packages (from Protobuf->tensorflow-object-detection-api) (57.0.0)
Requirement already satisfied: nbconvert in /usr/local/lib/python3.7/dist-packages (from jupyter->tensorflow-object-detection-api) (5.6.1)
Requirement already satisfied: jupyter-console in /usr/local/lib/python3.7/dist-packages (from jupyter->tensorflow-object-detection-api) (5.2.0)
Requirement already satisfied: notebook in /usr/local/lib/python3.7/dist-packages (from jupyter->tensorflow-object-detection-api) (5.3.1)
Requirement already satisfied: qtconsole in /usr/local/lib/python3.7/dist-packages (from jupyter->tensorflow-object-detection-api) (5.1.0)
Requirement already satisfied: ipywidgets in /usr/local/lib/python3.7/dist-packages (from jupyter->tensorflow-object-detection-api) (7.6.3)
Requirement already satisfied: ipynbkernel in /usr/local/lib/python3.7/dist-packages (from jupyter->tensorflow-object-detection-api) (4.10.1)
Requirement already satisfied: tensorflow-estimator<2.6.0,>=2.5.0rc0 in /usr/local/lib/python3.7/dist-packages (from tensorflow->tensorflow-object-detection-api) (2.5.0)

[ ] 1 !pip install pycocotools

Requirement already satisfied: pycocotools in /usr/local/lib/python3.7/dist-packages (2.0.2)
Requirement already satisfied: matplotlib==2.1.0 in /usr/local/lib/python3.7/dist-packages (from pycocotools) (3.2.2)
Requirement already satisfied: cython==0.27.3 in /usr/local/lib/python3.7/dist-packages (from pycocotools) (0.29.23)
Requirement already satisfied: setuptools==18.0 in /usr/local/lib/python3.7/dist-packages (from pycocotools) (57.0.0)
Requirement already satisfied: kiwisolver==1.0.1 in /usr/local/lib/python3.7/dist-packages (from matplotlib==2.1.0->pycocotools) (1.3.1)
Requirement already satisfied: pyparsing==2.0.4,!=2.1.2,!=2.1.6,!=2.0.1 in /usr/local/lib/python3.7/dist-packages (from matplotlib==2.1.0->pycocotools) (2.4.7)
Requirement already satisfied: numpy==1.11 in /usr/local/lib/python3.7/dist-packages (from matplotlib==2.1.0->pycocotools) (1.19.5)
Requirement already satisfied: cyclers==0.10 in /usr/local/lib/python3.7/dist-packages (from matplotlib==2.1.0->pycocotools) (0.10.0)
Requirement already satisfied: python-dateutil==2.1 in /usr/local/lib/python3.7/dist-packages (from matplotlib==2.1.0->pycocotools) (2.8.1)
Requirement already satisfied: six in /usr/local/lib/python3.7/dist-packages (from cyclers==0.10->matplotlib==2.1.0->pycocotools) (1.15.0)
```

Import libraries

```
[ ] 1 import numpy as np
    2 import os
    3 import six.moves.urllib as urllib
    4 import sys
    5 import tarfile
    6 import tensorflow as tf
    7 import zipfile
    8
    9 from collections import defaultdict
   10 from io import StringIO
   11 from matplotlib import pyplot as plt
   12 from PIL import Image
   13 from IPython.display import display
   14
   15 from object_detection.utils import ops as utils_ops
   16 from object_detection.utils import label_map_util
   17 from object_detection.utils import visualization_utils as vis_util
```

Verify path

```
[10] 1 import pathlib
      2 # If you want to test the code with your images, just add images to the test_images folder.
      3 PATH_TO_TEST_IMAGES_DIR = pathlib.Path('/content/drive/MyDrive/object_detection/test_images')
      4 TEST_IMAGE_PATHS = sorted(list(PATH_TO_TEST_IMAGES_DIR.glob("*.jpg")))
```

```
1 detection_model = tf.saved_model.load('/content/drive/MyDrive/object_detection/saved_model')
```

WARNING:absl:Importing a function (__inference_bifpn_layer_call_and_return_conditional_losses_55636) with ops with custom gradients. Will likely fail if a gradient is required.

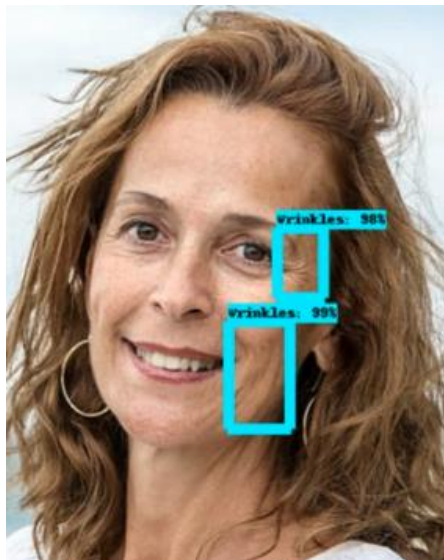
WARNING:absl:Importing a function (__inference_EfficientDet-D0_layer_call_and_return_conditional_losses_96337) with ops with custom gradients. Will likely fail if a gradient is required.

WARNING:absl:Importing a function (__inference_EfficientDet-D0_layer_call_and_return_conditional_losses_88986) with ops with custom gradients. Will likely fail if a gradient is required.

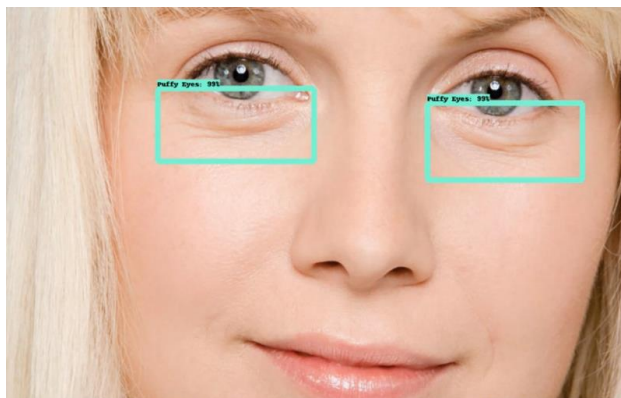
WARNING:absl:Importing a function (__inference_bifpn_layer_call_and_return_conditional_losses_121898) with ops with custom gradients. Will likely fail if a gradient is required.

PREDICTION AND ACCURACY OF DATA

Wrinkles



Puffy eyes



Dark spots



A combination of all attributes

