

SSD MobileNet V2 fpnlite 640 x 640

In []:

```
import os
from xml.etree import ElementTree
from bs4 import BeautifulSoup
import seaborn as sns
import collections
import pandas as pd
import xml.etree.ElementTree as ET
import cv2
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
import shutil
from imgaug.augmentables.bbs import BoundingBox, BoundingBoxesOnImage
from imgaug import augmenters as iaa
import imgaug as ia
import imageio
import re
import numpy as np
import time
```

In []:

```
from google.colab import drive
drive.mount('/content/drive')
```

Mounted at /content/drive

In []:

```
!nvidia-smi
```

NVIDIA-SMI has failed because it couldn't communicate with the NVIDIA driver. Make sure that the latest NVIDIA driver is installed and running.

In []:

```
%cd /content
!unzip /content/drive/MyDrive/data.zip
```

Road Damage Type :

Table 1: Road Damage Types and Definitions considered in Maeda et al. (2018)

| Damage Type | | | Detail | Class Name | |
|--------------|-----------------|--------------|------------------------------------|------------|--|
| Crack | Linear Crack | Longitudinal | Wheel-marked part | D00 | |
| | | | Construction joint part | D01 | |
| | | Lateral | Equal interval | D10 | |
| | Alligator Crack | | Construction joint part | D11 | |
| | | | Partial pavement, overall pavement | D20 | |
| Other Damage | | | Pothole | D40 | |
| | | | Cross walk blur | D43 | |
| | | | White line blur | D44 | |

In []:

```
file_list = [filename for filename in os.listdir('/content/content/data/Images/train_images')]
print('Total train images in train_images folder : ',len(file_list))

file_list = [filename for filename in os.listdir('/content/content/data/Images/test_images')]
print('Total train images in test_images folder : ',len(file_list))
```

```
file_list = [filename for filename in os.listdir('/content/content/data/Images/augmented_image')]
print('Total train images in augmented_images folder : ',len(file_list))
```

```
Total train images in train_images folder : 11654
Total train images in test_images folder : 2914
Total train images in augmented_images folder : 11654
```

In []:

```
augmented_train_images_df = pd.read_csv('/content/content/data/label_csv/ aug_train_label.csv')
augmented_train_images_df.head()
```

Out[]:

| | filename | width | height | label | xmin | ymin | xmax | ymax |
|---|----------------------|-------|--------|-------|------------|-----------|-----------|-----------|
| 0 | aug_India_002925.jpg | 640 | 640 | D00 | 2.063132 | 302.10380 | 195.48555 | 583.27390 |
| 1 | aug_India_002925.jpg | 640 | 640 | D00 | 516.283750 | 411.55258 | 610.63610 | 563.45996 |
| 2 | aug_India_002925.jpg | 640 | 640 | D40 | 591.765700 | 455.89820 | 640.00000 | 523.83190 |
| 3 | aug_Japan_002084.jpg | 640 | 640 | D20 | 2.200012 | 441.60000 | 188.86667 | 600.53330 |
| 4 | aug_Japan_002084.jpg | 640 | 640 | D10 | 169.666660 | 390.40002 | 224.06668 | 406.40000 |

In []:

```
#grouped_original = test_label_df.groupby('filename')
grouped_resized = augmented_train_images_df.groupby('filename')

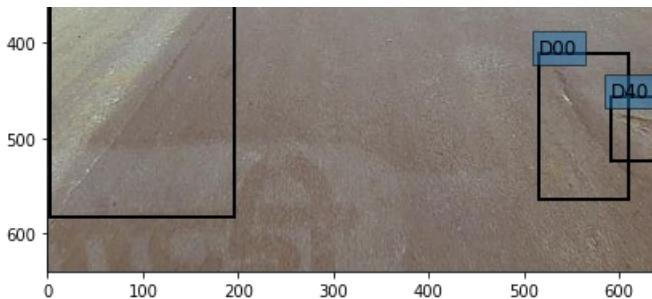
for filename in augmented_train_images_df ['filename'].unique()[0:20]:
    fig, cell = plt.subplots(1, 1, figsize=(7,7))

    group_r_df = grouped_resized.get_group(filename)
    group_r_df = group_r_df.reset_index()
    group_r_df = group_r_df.drop(['index'], axis=1)
    bb_r_array = group_r_df.drop(['filename', 'width', 'height'], axis=1).values
    resized_img = imageio.imread('/content/content/data/Images/augmented_image/' + filename)
    img_array1 = np.asarray(resized_img)
    cell.imshow(img_array1)

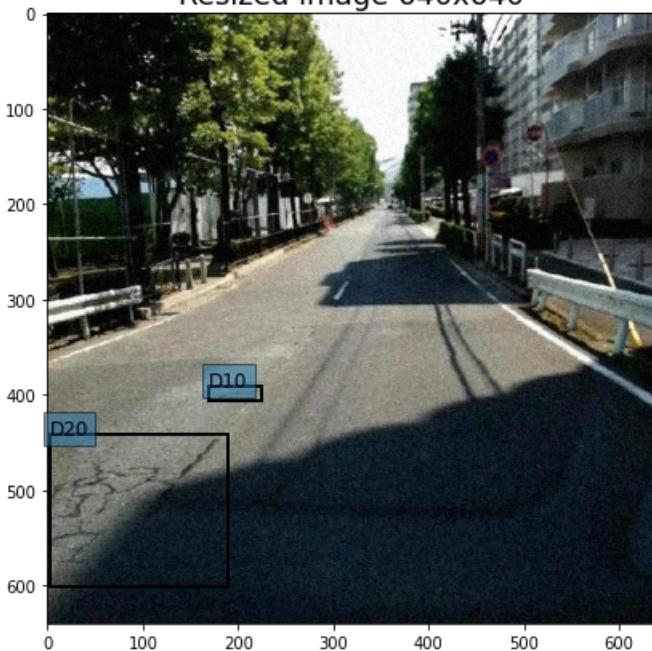
    #bbs_r = BoundingBoxesOnImage.from_xyxy_array(bb_r_array, shape=resized_img.shape)
    #print(bb_r_array)
    for box in bb_r_array:
        xmin = box[1]
        ymin = box[2]
        xmax = box[3]
        ymax = box[4]
        # color = colors[int(box[0])]
        label = '{}'.format(box[0])
        cell.set_title('Resized image 640x640', fontsize = 18)
        cell.add_patch(plt.Rectangle((xmin, ymin), xmax-xmin, ymax-ymin, fill=False, linewidth=2))
        cell.text(xmin, ymin, label, size='large', color='black', bbox={'alpha':0.5})
```

Resized image 640x640

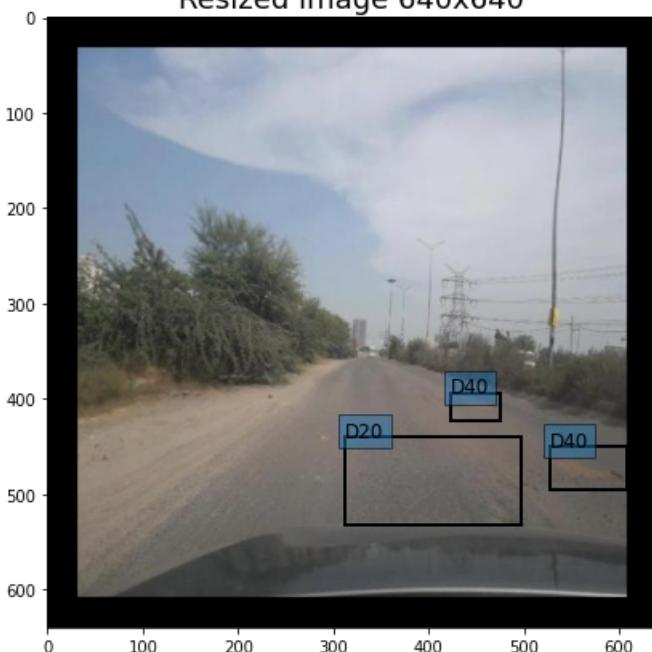




Resized image 640x640



Resized image 640x640

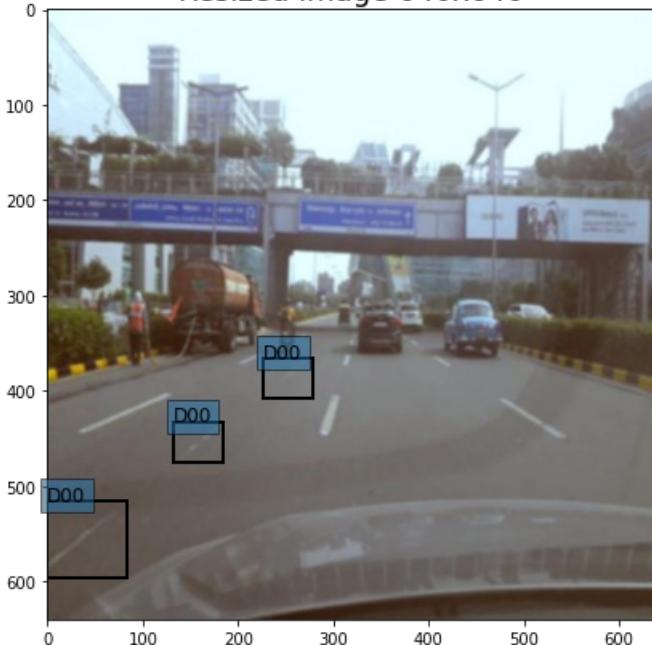


Resized image 640x640

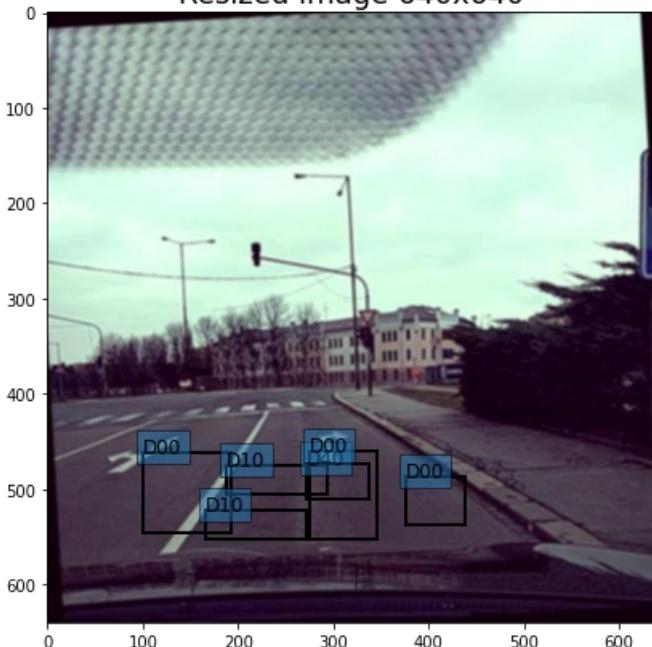




Resized image 640x640

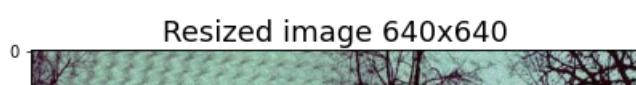
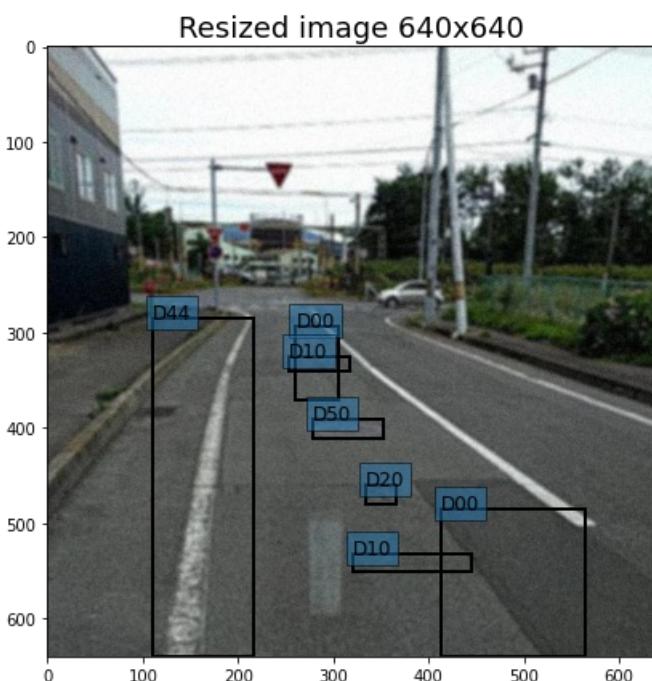
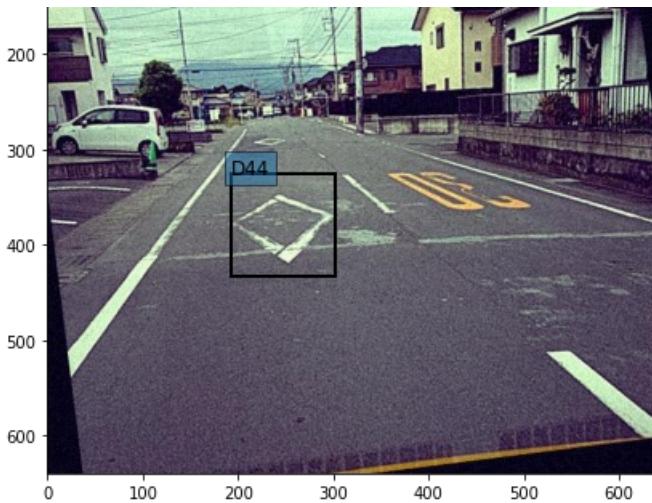


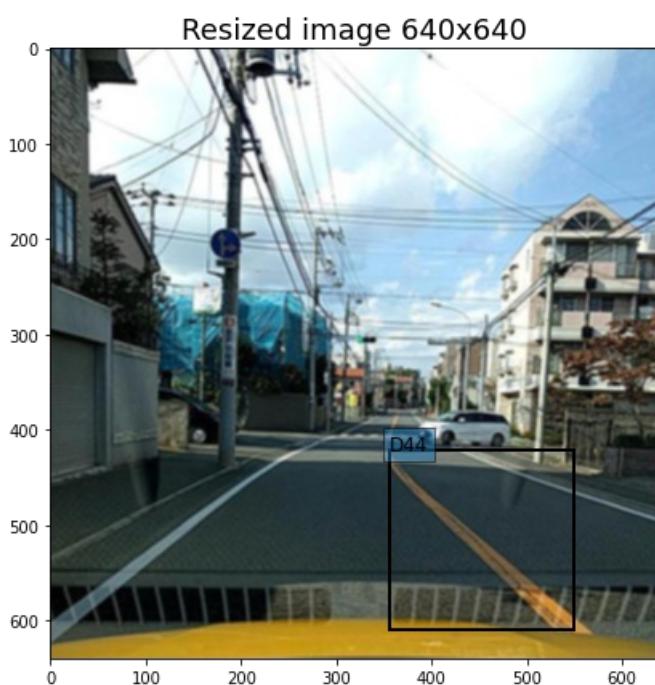
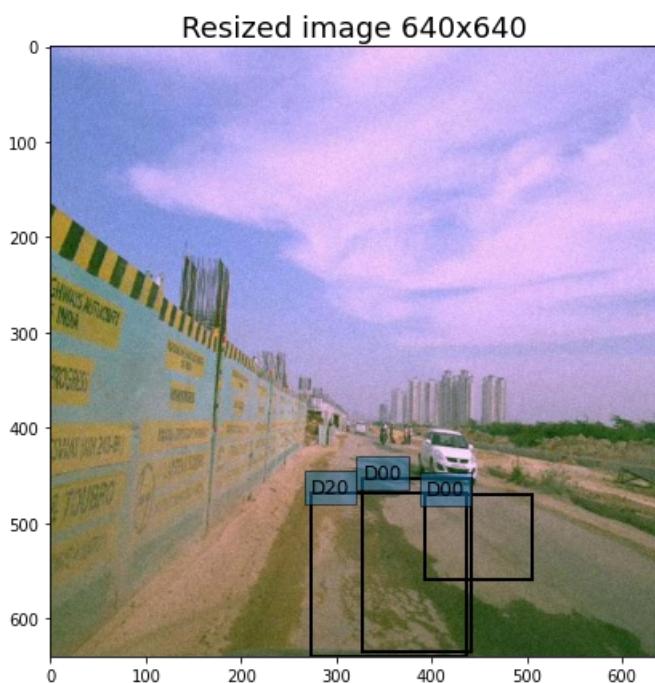
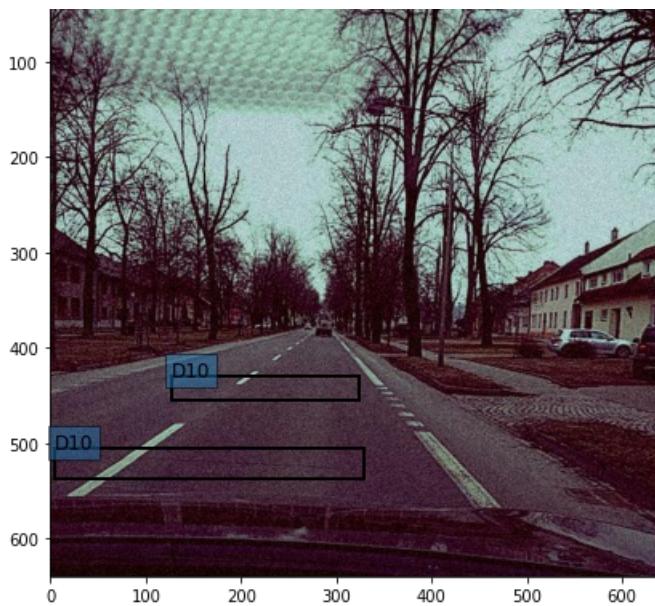
Resized image 640x640



Resized image 640x640



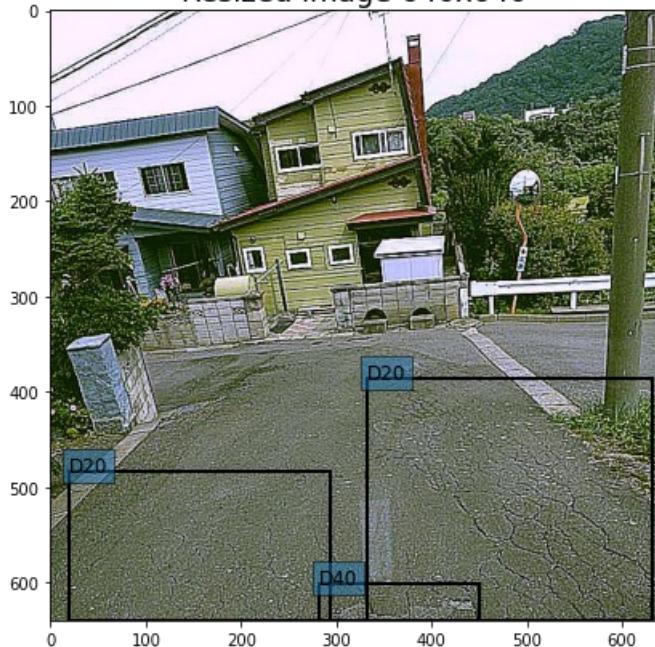




Resized image 640x640



Resized image 640x640

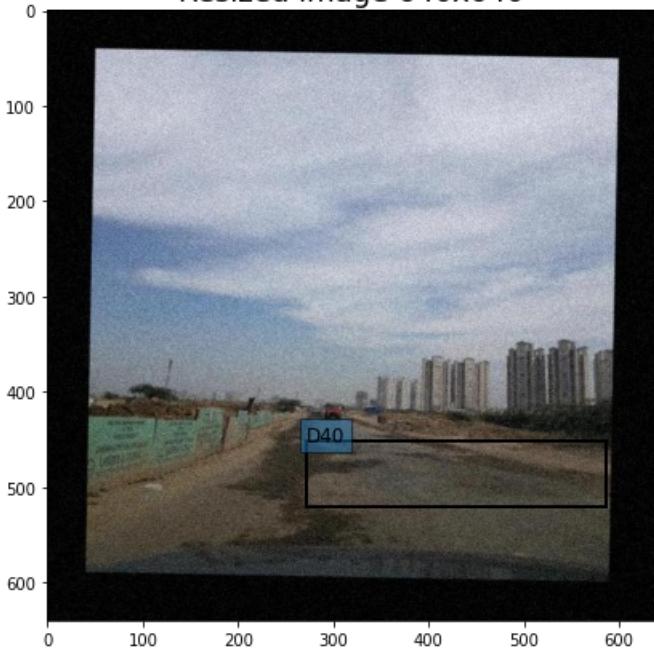


Resized image 640x640

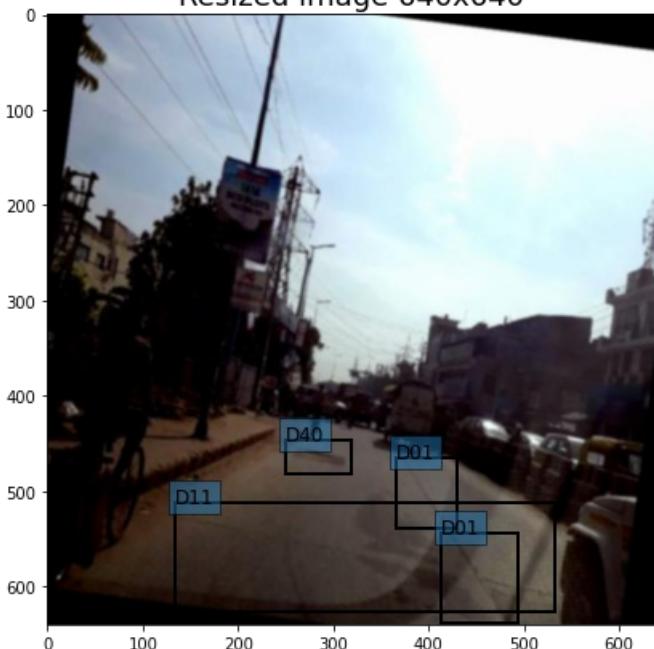




Resized image 640x640



Resized image 640x640



Resized image 640x640

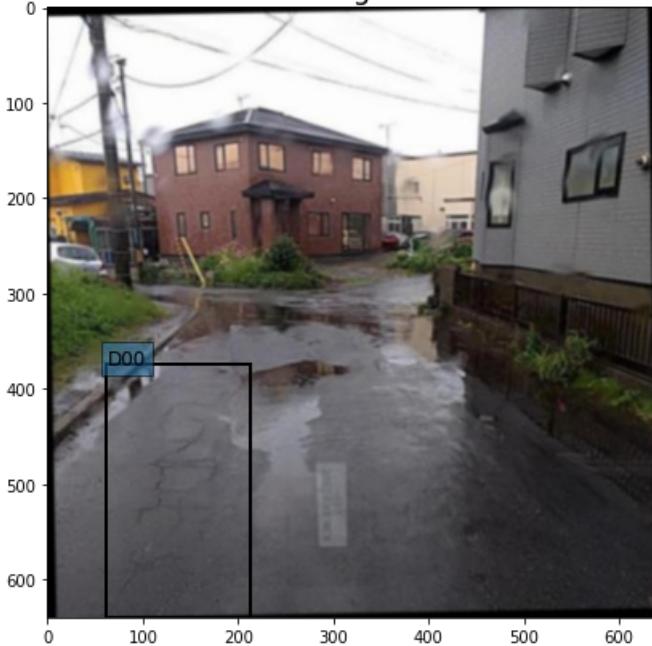




Resized image 640x640



Resized image 640x640



In []:

```
org_aug_train_combine = pd.read_csv('/content/content/data/label_csv/orignal_plus_aug_combine.csv')
)
org_aug_train_combine.head()
```

Out []:

| | filename | width | height | label | xmin | ymin | xmax | ymax |
|---|------------------|-------|--------|-------|------------|-----------|-----------|----------|
| 0 | India_002925.jpg | 640 | 640 | D00 | 20.444447 | 303.11110 | 202.66666 | 568.0000 |
| 1 | India_002925.jpg | 640 | 640 | D00 | 504.888900 | 406.22223 | 593.77780 | 549.3334 |

| Z | filename | width | height | label | xmin | ymax | xmax | ymax |
|---|------------------|-------|--------|-------|------------|-----------|-----------|----------|
| 3 | Japan_002084.jpg | 640 | 640 | D20 | 450.133330 | 441.60000 | 636.80000 | 600.5333 |
| 4 | Japan_002084.jpg | 640 | 640 | D10 | 414.933320 | 390.40002 | 469.33334 | 406.4000 |

In []:

```
for fil in augmented_train_images_df.filename.values:
    shutil.copy( '/content/content/data/Images/augmented_image/'+ fil,
"/content/content/data/Images/train_images/")

file_list = [filename for filename in os.listdir('/content/content/data/Images/train_images')]
print('Total train images in train_images folder : ',len(file_list))
```

Total train images in train_images folder : 23304

In []:

```
file_list = [filename for filename in os.listdir('/content/content/data/Images/train_images')]
print('Total train images in train_images folder : ',len(file_list))
```

Total train images in train_images folder : 23304

In []:

```
!rm -rf /content/content/data/Images/augmented_image
```

TF Records :

In []:

```
!pip install tensorflow-object-detection-api
```

```
Collecting tensorflow-object-detection-api
  Downloading https://files.pythonhosted.org/packages/4e/11/7f6d3c5c4b603cc40b2813059779afb641bd5eb68045c62ca520k359/tensorflow_object_detection_api-0.1.1.tar.gz (577kB)
    |████████| 583kB 6.0MB/s
Requirement already satisfied: Pillow>=1.0 in /usr/local/lib/python3.6/dist-packages (from tensorflow-object-detection-api) (7.0.0)
Requirement already satisfied: Matplotlib>=2.1 in /usr/local/lib/python3.6/dist-packages (from tensorflow-object-detection-api) (3.2.2)
Requirement already satisfied: Cython>=0.28.1 in /usr/local/lib/python3.6/dist-packages (from tensorflow-object-detection-api) (0.29.21)
Requirement already satisfied: Protobuf in /usr/local/lib/python3.6/dist-packages (from tensorflow-object-detection-api) (3.12.4)
Requirement already satisfied: lxml in /usr/local/lib/python3.6/dist-packages (from tensorflow-object-detection-api) (4.2.6)
Requirement already satisfied: jupyter in /usr/local/lib/python3.6/dist-packages (from tensorflow-object-detection-api) (1.0.0)
Requirement already satisfied: tensorflow in /usr/local/lib/python3.6/dist-packages (from tensorflow-object-detection-api) (2.3.0)
Requirement already satisfied: contextlib2 in /usr/local/lib/python3.6/dist-packages (from tensorflow-object-detection-api) (0.5.5)
Requirement already satisfied: wheel in /usr/local/lib/python3.6/dist-packages (from tensorflow-object-detection-api) (0.36.1)
Collecting twine
  Downloading https://files.pythonhosted.org/packages/ad/db/b2c65078b783c6694bdfa0911bbbe0e2be7fc98ff23a99b8be56b6/twine-3.2.0-py3-none-any.whl
Requirement already satisfied: pyparsing!=2.0.4,!>=2.1.2,!>=2.1.6,>=2.0.1 in /usr/local/lib/python3.6/dist-packages (from Matplotlib>=2.1->tensorflow-object-detection-api) (2.4.7)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.6/dist-packages (from Matplotlib>=2.1->tensorflow-object-detection-api) (1.3.1)
Requirement already satisfied: python-dateutil>=2.1 in /usr/local/lib/python3.6/dist-packages (from Matplotlib>=2.1->tensorflow-object-detection-api) (2.8.1)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.6/dist-packages (from Matplotlib>=2.1->tensorflow-object-detection-api) (0.10.0)
```

```
Requirement already satisfied: numpy>=1.11 in /usr/local/lib/python3.6/dist-packages (from
Matplotlib>=2.1->tensorflow-object-detection-api) (1.18.5)
Requirement already satisfied: six>=1.9 in /usr/local/lib/python3.6/dist-packages (from Protobuf>
tensorflow-object-detection-api) (1.15.0)
Requirement already satisfied: setuptools in /usr/local/lib/python3.6/dist-packages (from
Protobuf->tensorflow-object-detection-api) (50.3.2)
Requirement already satisfied: ipykernel in /usr/local/lib/python3.6/dist-packages (from jupyter->
tensorflow-object-detection-api) (4.10.1)
Requirement already satisfied: jupyter-console in /usr/local/lib/python3.6/dist-packages (from jupyter->
tensorflow-object-detection-api) (5.2.0)
Requirement already satisfied: nbconvert in /usr/local/lib/python3.6/dist-packages (from jupyter->
tensorflow-object-detection-api) (5.6.1)
Requirement already satisfied: ipywidgets in /usr/local/lib/python3.6/dist-packages (from jupyter->
tensorflow-object-detection-api) (7.5.1)
Requirement already satisfied: notebook in /usr/local/lib/python3.6/dist-packages (from jupyter->t
ensorflow-object-detection-api) (5.3.1)
Requirement already satisfied: qtconsole in /usr/local/lib/python3.6/dist-packages (from jupyter->
tensorflow-object-detection-api) (5.0.1)
Requirement already satisfied: absl-py>=0.7.0 in /usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (0.10.0)
Requirement already satisfied: astunparse==1.6.3 in /usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (1.6.3)
Requirement already satisfied: tensorflow-estimator<2.4.0,>=2.3.0 in
/usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (2.3.0)
Requirement already satisfied: tensorboard<3,>=2.3.0 in /usr/local/lib/python3.6/dist-packages
(from tensorflow->tensorflow-object-detection-api) (2.3.0)
Requirement already satisfied: termcolor>=1.1.0 in /usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (1.1.0)
Requirement already satisfied: wrapt>=1.11.1 in /usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (1.12.1)
Requirement already satisfied: grpcio>=1.8.6 in /usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (1.34.0)
Requirement already satisfied: h5py<2.11.0,>=2.10.0 in /usr/local/lib/python3.6/dist-packages
(from tensorflow->tensorflow-object-detection-api) (2.10.0)
Requirement already satisfied: keras-preprocessing<1.2,>=1.1.1 in /usr/local/lib/python3.6/dist-pa
ckages (from tensorflow->tensorflow-object-detection-api) (1.1.2)
Requirement already satisfied: opt-einsum>=2.3.2 in /usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (3.3.0)
Requirement already satisfied: scipy==1.4.1 in /usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (1.4.1)
Requirement already satisfied: gast==0.3.3 in /usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (0.3.3)
Requirement already satisfied: google-pasta>=0.1.8 in /usr/local/lib/python3.6/dist-packages (from tensorflow->tensorflow-object-detection-api) (0.2.0)
Collecting colorama>=0.4.3
    Downloading
https://files.pythonhosted.org/packages/44/98/5b86278fbbf250d239ae0ecb724f8572af1c91f4a11edf4d36a2c
440/colorama-0.4.4-py2.py3-none-any.whl
Collecting requests_toolbelt!=0.9.0,>=0.8.0
    Downloading
https://files.pythonhosted.org/packages/60/ef/7681134338fc097acef8d9b2f8abe0458e4d87559c689a8c306dc
ce5/requests_toolbelt-0.9.1-py2.py3-none-any.whl (54kB)
    |██████████| 61kB 8.8MB/s
Requirement already satisfied: tqdm>=4.14 in /usr/local/lib/python3.6/dist-packages (from twine->tensorflow-object-detection-api) (4.41.1)
Collecting pkginfo>=1.4.2
    Downloading
https://files.pythonhosted.org/packages/4f/3c/535287349af1b117e082f8e77feca52fbe2fdf61ef1e6da6bcc2a
a79/pkginfo-1.6.1-py2.py3-none-any.whl
Collecting rfc3986>=1.4.0
    Downloading
https://files.pythonhosted.org/packages/78/be/7b8b99fd74ff5684225f50dd0e865393d2265656ef3b4ba9eaaaf
2b8/rfc3986-1.4.0-py2.py3-none-any.whl
Requirement already satisfied: requests>=2.20 in /usr/local/lib/python3.6/dist-packages (from twine->tensorflow-object-detection-api) (2.23.0)
Requirement already satisfied: importlib-metadata; python_version < "3.8" in
/usr/local/lib/python3.6/dist-packages (from twine->tensorflow-object-detection-api) (3.1.1)
Collecting readme-renderer>=21.0
    Downloading
https://files.pythonhosted.org/packages/54/18/0adfcac99c08a6d45947e5da4e1388a7bb9957502a2b4ad12176f
eaf/readme_renderer-28.0-py2.py3-none-any.whl
Collecting keyring>=15.1
    Downloading
https://files.pythonhosted.org/packages/53/14/1c952bcd21255f42f9ba0280d3abd8074dca2c27d136eb749b98a
f72/keyring-21.5.0-py3-none-any.whl
Requirement already satisfied: traitlets>=4.1.0 in /usr/local/lib/python3.6/dist-packages (from ipykernel->jupyter->tensorflow-object-detection-api) (4.3.3)
```

```
Requirement already satisfied: ipython>=4.0.0 in /usr/local/lib/python3.6/dist-packages (from
ipykernel->jupyter->tensorflow-object-detection-api) (5.5.0)
Requirement already satisfied: jupyter-client in /usr/local/lib/python3.6/dist-packages (from
ipykernel->jupyter->tensorflow-object-detection-api) (5.3.5)
Requirement already satisfied: tornado>=4.0 in /usr/local/lib/python3.6/dist-packages (from
ipykernel->jupyter->tensorflow-object-detection-api) (5.1.1)
Requirement already satisfied: pygments in /usr/local/lib/python3.6/dist-packages (from jupyter-co
nsole->jupyter->tensorflow-object-detection-api) (2.6.1)
Requirement already satisfied: prompt-toolkit<2.0.0,>=1.0.0 in /usr/local/lib/python3.6/dist-
packages (from jupyter-console->jupyter->tensorflow-object-detection-api) (1.0.18)
Requirement already satisfied: testpath in /usr/local/lib/python3.6/dist-packages (from nbconvert-
>jupyter->tensorflow-object-detection-api) (0.4.4)
Requirement already satisfied: bleach in /usr/local/lib/python3.6/dist-packages (from nbconvert-
>jupyter->tensorflow-object-detection-api) (3.2.1)
Requirement already satisfied: entrypoints>=0.2.2 in /usr/local/lib/python3.6/dist-packages (from
nbconvert->jupyter->tensorflow-object-detection-api) (0.3)
Requirement already satisfied: jupyter-core in /usr/local/lib/python3.6/dist-packages (from
nbconvert->jupyter->tensorflow-object-detection-api) (4.7.0)
Requirement already satisfied: jinja2>=2.4 in /usr/local/lib/python3.6/dist-packages (from
nbconvert->jupyter->tensorflow-object-detection-api) (2.11.2)
Requirement already satisfied: pandocfilters>=1.4.1 in /usr/local/lib/python3.6/dist-packages
(from nbconvert->jupyter->tensorflow-object-detection-api) (1.4.3)
Requirement already satisfied: nbformat>=4.4 in /usr/local/lib/python3.6/dist-packages (from
nbconvert->jupyter->tensorflow-object-detection-api) (5.0.8)
Requirement already satisfied: mistune<2,>=0.8.1 in /usr/local/lib/python3.6/dist-packages (from
nbconvert->jupyter->tensorflow-object-detection-api) (0.8.4)
Requirement already satisfied: defusedxml in /usr/local/lib/python3.6/dist-packages (from
nbconvert->jupyter->tensorflow-object-detection-api) (0.6.0)
Requirement already satisfied: widgetsnbextension~=3.5.0 in /usr/local/lib/python3.6/dist-packages
(from ipywidgets->jupyter->tensorflow-object-detection-api) (3.5.1)
Requirement already satisfied: ipython-genutils in /usr/local/lib/python3.6/dist-packages (from
notebook->jupyter->tensorflow-object-detection-api) (0.2.0)
Requirement already satisfied: Send2Trash in /usr/local/lib/python3.6/dist-packages (from
notebook->jupyter->tensorflow-object-detection-api) (1.5.0)
Requirement already satisfied: terminado>=0.8.1 in /usr/local/lib/python3.6/dist-packages (from
notebook->jupyter->tensorflow-object-detection-api) (0.9.1)
Requirement already satisfied: qtpy in /usr/local/lib/python3.6/dist-packages (from qtconsole-
>jupyter->tensorflow-object-detection-api) (1.9.0)
Requirement already satisfied: pyzmq>=17.1 in /usr/local/lib/python3.6/dist-packages (from
qtconsole->jupyter->tensorflow-object-detection-api) (20.0.0)
Requirement already satisfied: tensorboard-plugin-wit>=1.6.0 in /usr/local/lib/python3.6/dist-
packages (from tensorboard<3,>=2.3.0->tensorflow->tensorflow-object-detection-api) (1.7.0)
Requirement already satisfied: google-auth<2,>=1.6.3 in /usr/local/lib/python3.6/dist-packages
(from tensorboard<3,>=2.3.0->tensorflow->tensorflow-object-detection-api) (1.17.2)
Requirement already satisfied: werkzeug>=0.11.15 in /usr/local/lib/python3.6/dist-packages (from
tensorboard<3,>=2.3.0->tensorflow->tensorflow-object-detection-api) (1.0.1)
Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in /usr/local/lib/python3.6/dist-p
ackages (from tensorboard<3,>=2.3.0->tensorflow->tensorflow-object-detection-api) (0.4.2)
Requirement already satisfied: markdown>=2.6.8 in /usr/local/lib/python3.6/dist-packages (from
tensorboard<3,>=2.3.0->tensorflow->tensorflow-object-detection-api) (3.3.3)
Requirement already satisfied: urllib3!=1.25.0,!>=1.25.1,<1.26,>=1.21.1 in
/usr/local/lib/python3.6/dist-packages (from requests>=2.20->twine->tensorflow-object-detection-ap
i) (1.24.3)
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.6/dist-packages (from
requests>=2.20->twine->tensorflow-object-detection-api) (2.10)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.6/dist-packages (from
requests>=2.20->twine->tensorflow-object-detection-api) (2020.12.5)
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.6/dist-packages (from
requests>=2.20->twine->tensorflow-object-detection-api) (3.0.4)
Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.6/dist-packages (from
importlib-metadata; python_version < "3.8"->twine->tensorflow-object-detection-api) (3.4.0)
Requirement already satisfied: docutils>=0.13.1 in /usr/local/lib/python3.6/dist-packages (from
readme-renderer>=21.0->twine->tensorflow-object-detection-api) (0.16)
Collecting jeepney>=0.4.2; sys_platform == "linux"
    Downloading
https://files.pythonhosted.org/packages/51/b0/a6ea72741aaac3f37fb96d195e4ee576a103c4c04e279bc6b446a
0e1/jeepney-0.6.0-py3-none-any.whl (45kB)
    |████████| 51kB 7.5MB/s
Collecting SecretStorage>=3.2; sys_platform == "linux"
    Downloading
https://files.pythonhosted.org/packages/63/a2/a6d9099b14eb5dbbb04fb722d2b5322688f8f99b471bdf2097e33
091/SecretStorage-3.3.0-py3-none-any.whl
Requirement already satisfied: decorator in /usr/local/lib/python3.6/dist-packages (from
traitlets>=4.1.0->ipykernel->jupyter->tensorflow-object-detection-api) (4.4.2)
Requirement already satisfied: simplegeneric>0.8 in /usr/local/lib/python3.6/dist-packages (from
ipython>=4.0.0->ipykernel->jupyter->tensorflow-object-detection-api) (0.8.1)
Requirement already satisfied: pickleshare in /usr/local/lib/python3.6/dist-packages (from
```

```
ipython>=4.0.0->ipykernel->jupyter->tensorflow-object-detection-api) (0.7.5)
Requirement already satisfied: pexpect; sys_platform != "win32" in /usr/local/lib/python3.6/dist-p
ackages (from ipython>=4.0.0->ipykernel->jupyter->tensorflow-object-detection-api) (4.8.0)
Requirement already satisfied: wcwidth in /usr/local/lib/python3.6/dist-packages (from prompt-
toolkit<2.0.0,>=1.0.0->jupyter-console->jupyter->tensorflow-object-detection-api) (0.2.5)
Requirement already satisfied: packaging in /usr/local/lib/python3.6/dist-packages (from bleach-
>nbconvert->jupyter->tensorflow-object-detection-api) (20.7)
Requirement already satisfied: webencodings in /usr/local/lib/python3.6/dist-packages (from
bleach->nbconvert->jupyter->tensorflow-object-detection-api) (0.5.1)
Requirement already satisfied: MarkupSafe>=0.23 in /usr/local/lib/python3.6/dist-packages (from
jinja2>=2.4->nbconvert->jupyter->tensorflow-object-detection-api) (1.1.1)
Requirement already satisfied: jsonschema!=2.5.0,>=2.4 in /usr/local/lib/python3.6/dist-packages
(from nbformat>=4.4->nbconvert->jupyter->tensorflow-object-detection-api) (2.6.0)
Requirement already satisfied: ptyprocess; os_name != "nt" in /usr/local/lib/python3.6/dist-
packages (from terminado>=0.8.1->notebook->jupyter->tensorflow-object-detection-api) (0.6.0)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.6/dist-packages
(from google-auth<2,>=1.6.3->tensorboard<3,>=2.3.0->tensorflow->tensorflow-object-detection-api) (0.2.8)
Requirement already satisfied: cachetools<5.0,>=2.0.0 in /usr/local/lib/python3.6/dist-packages
(from google-auth<2,>=1.6.3->tensorboard<3,>=2.3.0->tensorflow->tensorflow-object-detection-api) (4.1.1)
Requirement already satisfied: rsa<5,>=3.1.4; python_version >= "3" in
/usr/local/lib/python3.6/dist-packages (from google-auth<2,>=1.6.3->tensorboard<3,>=2.3.0-
>tensorflow->tensorflow-object-detection-api) (4.6)
Requirement already satisfied: requests-oauthlib>=0.7.0 in /usr/local/lib/python3.6/dist-packages
(from google-auth-oauthlib<0.5,>=0.4.1->tensorboard<3,>=2.3.0->tensorflow->tensorflow-object-detec-
tion-api) (1.3.0)
Collecting cryptography>=2.0
  Downloading
https://files.pythonhosted.org/packages/c9/de/7054df0620b5411ba45480f0261e1fb66a53f3db31b28e3aa52c0
2d9/cryptography-3.3.1-cp36-abi3-manylinux2010_x86_64.whl (2.6MB)
|██████████| 2.6MB 47.9MB/s
Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in /usr/local/lib/python3.6/dist-packages
(from pyasn1-modules>=0.2.1->google-auth<2,>=1.6.3->tensorboard<3,>=2.3.0->tensorflow->tensorflow-
object-detection-api) (0.4.8)
Requirement already satisfied: oauthlib>=3.0.0 in /usr/local/lib/python3.6/dist-packages (from
requests-oauthlib>=0.7.0->google-auth-oauthlib<0.5,>=0.4.1->tensorboard<3,>=2.3.0->tensorflow->ten-
sorflow-object-detection-api) (3.1.0)
Requirement already satisfied: ffi>=1.12 in /usr/local/lib/python3.6/dist-packages (from
cryptography>=2.0->SecretStorage>=3.2; sys_platform == "linux"->keyring>=15.1->twine->tensorflow-
object-detection-api) (1.14.4)
Requirement already satisfied: pycparser in /usr/local/lib/python3.6/dist-packages (from
cffi>=1.12->cryptography>=2.0->SecretStorage>=3.2; sys_platform == "linux"->keyring>=15.1->twine->
tensorflow-object-detection-api) (2.20)
Building wheels for collected packages: tensorflow-object-detection-api
  Building wheel for tensorflow-object-detection-api (setup.py) ... done
  Created wheel for tensorflow-object-detection-api: filename=tensorflow_object_detection_api-0.1.
1-cp36-none-any.whl size=844515
sha256=504fae3c84ff3d2cebeabffd6bef4cea5458b0b2c820be3e9e03e1684be64fde
  Stored in directory:
/root/.cache/pip/wheels/4a/54/d0/cfca11930c4b2025d40dede77059094070a67cc3e7bd3b285f
Successfully built tensorflow-object-detection-api
Installing collected packages: colorama, requests-toolbelt, pkginfo, rfc3986, readme-renderer, jee
pney, cryptography, SecretStorage, keyring, twine, tensorflow-object-detection-api
Successfully installed SecretStorage-3.3.0 colorama-0.4.4 cryptography-3.3.1 jeepney-0.6.0
keyring-21.5.0 pkginfo-1.6.1 readme-renderer-28.0 requests-toolbelt-0.9.1 rfc3986-1.4.0
tensorflow-object-detection-api-0.1.1 twine-3.2.0
```

In []:

```
! mkdir '/content/content/data/tf_record'
```

In []:

```
!python /content/content/data/generate_tfrecord.py
--csv_input=/content/content/data/label_csv/original_plus_aug_combine.csv \
--output_path=/content/content/data/tf_record/train.record \
--image_dir=/content/content/data/Images/train_images
```

```
2020-12-11 15:53:55.248734: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]
Successfully opened dynamic library libcudart.so.10.1
Successfully created the TFRecords: /content/content/data/tf_record/train.record
```

In []:

```
!python /content/content/data/generate_tfrecord.py  
--csv_input=/content/content/data/label_csv/test_resized_label.csv \  
--output_path=/content/content/data/tf_record/test.record \  
--image_dir=/content/content/data/Images/test_images
```

```
2020-12-11 15:54:38.015061: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]  
Successfully opened dynamic library libcudart.so.10.1  
Successfully created the TFRecords: /content/content/data/tf_record/test.record
```

Start With Training:

Installing pre-requisites

In []:

```
#unzipped model weights file  
%cd /content  
!tar -xvf /content/ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8.tar.gz
```

```
/content  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/checkpoint/  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/checkpoint/ckpt-0.data-00000-of-00001  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/checkpoint/checkpoint  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/checkpoint/ckpt-0.index  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/pipeline.config  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/saved_model/  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/saved_model/saved_model.pb  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/saved_model/variables/  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/saved_model/variables/variables.data-00000-of-00001  
ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/saved_model/variables/variables.index
```

In []:

```
#clone tensorflow model repo;  
!git clone https://github.com/tensorflow/models.git
```

```
Cloning into 'models'...  
remote: Enumerating objects: 48270, done.  
remote: Total 48270 (delta 0), reused 0 (delta 0), pack-reused 48270  
Receiving objects: 100% (48270/48270), 552.17 MiB | 31.64 MiB/s, done.  
Resolving deltas: 100% (33285/33285), done.
```

In []:

```
%cd '/content/models/research/object_detection/builders'  
from object_detection.utils import label_map_util  
from object_detection.utils import visualization_utils as viz_utils  
  
!pip install tf_slim  
!pip install lvis  
!pip install tf-models-official  
  
/content/models/research/object_detection/builders  
Collecting tf_slim  
  Downloading  
https://files.pythonhosted.org/packages/02/97/b0f4a64df018ca018cc035d44f2ef08f91e2e8aa67271f6f19633  
ff7/tf_slim-1.1.0-py2.py3-none-any.whl (352kB)  
   |██████████| 358kB 5.7MB/s  
Requirement already satisfied: absl-py>=0.2.2 in /usr/local/lib/python3.6/dist-packages (from  
tf_slim) (0.10.0)  
Requirement already satisfied: six in /usr/local/lib/python3.6/dist-packages (from absl-py>=0.2.2->tf_slim) (1.15.0)  
Installing collected packages: tf-slim  
Successfully installed tf-slim-1.1.0  
Collecting lvis  
  Downloadin~
```

```
  Downloading
https://files.pythonhosted.org/packages/72/b6/1992240ab48310b5360bfdd1d53163f43bb97d90dc5dc723c67d4
e78/lvis-0.5.3-py3-none-any.whl
Requirement already satisfied: kiwisolver>=1.1.0 in /usr/local/lib/python3.6/dist-packages (from
lvis) (1.3.1)
Requirement already satisfied: Cython>=0.29.12 in /usr/local/lib/python3.6/dist-packages (from
lvis) (0.29.21)
Requirement already satisfied: six>=1.12.0 in /usr/local/lib/python3.6/dist-packages (from lvis)
(1.15.0)
Requirement already satisfied: pyparsing>=2.4.0 in /usr/local/lib/python3.6/dist-packages (from
lvis) (2.4.7)
Requirement already satisfied: python-dateutil>=2.8.0 in /usr/local/lib/python3.6/dist-packages
(from lvis) (2.8.1)
Requirement already satisfied: opencv-python>=4.1.0.25 in /usr/local/lib/python3.6/dist-packages
(from lvis) (4.1.2.30)
Requirement already satisfied: cycler>=0.10.0 in /usr/local/lib/python3.6/dist-packages (from
lvis) (0.10.0)
Requirement already satisfied: matplotlib>=3.1.1 in /usr/local/lib/python3.6/dist-packages (from
lvis) (3.2.2)
Requirement already satisfied: numpy>=1.18.2 in /usr/local/lib/python3.6/dist-packages (from lvis)
(1.18.5)
Installing collected packages: lvis
Successfully installed lvis-0.5.3
Collecting tf-models-official
  Downloading
https://files.pythonhosted.org/packages/5b/33/91e5e90e3e96292717245d3fe87eb3b35b07c8a2113f2da7f482c
cdb/tf_models_official-2.3.0-py2.py3-none-any.whl (840kB)
|██████████| 849kB 4.3MB/s
Collecting sentencepiece
  Downloading
https://files.pythonhosted.org/packages/e5/2d/6d4ca4bef9a67070fa1cac508606328329152b1df10bdf31fb6e4
894/sentencepiece-0.1.94-cp36-cp36m-manylinux2014_x86_64.whl (1.1MB)
|██████████| 1.1MB 18.3MB/s
Requirement already satisfied: Cython in /usr/local/lib/python3.6/dist-packages (from tf-models-of
ficial) (0.29.21)
Requirement already satisfied: tf-slim>=1.1.0 in /usr/local/lib/python3.6/dist-packages (from tf-m
odels-official) (1.1.0)
Requirement already satisfied: pandas>=0.22.0 in /usr/local/lib/python3.6/dist-packages (from tf-m
odels-official) (1.1.5)
Requirement already satisfied: tensorflow-addons in /usr/local/lib/python3.6/dist-packages (from
tf-models-official) (0.8.3)
Requirement already satisfied: dataclasses in /usr/local/lib/python3.6/dist-packages (from tf-
models-official) (0.8)
Requirement already satisfied: Pillow in /usr/local/lib/python3.6/dist-packages (from tf-models-of
ficial) (7.0.0)
Collecting py-cpuinfo>=3.3.0
  Downloading
https://files.pythonhosted.org/packages/f6/f5/8e6e85ce2e9f6e05040cf0d4e26f43a4718bcc4bce988b433276c
5c1/py-cpuinfo-7.0.0.tar.gz (95kB)
|██████████| 102kB 10.9MB/s
Requirement already satisfied: psutil>=5.4.3 in /usr/local/lib/python3.6/dist-packages (from tf-
models-official) (5.4.8)
Requirement already satisfied: tensorflow-datasets in /usr/local/lib/python3.6/dist-packages (from
tf-models-official) (4.0.1)
Collecting tensorflow-model-optimization>=0.2.1
  Downloading
https://files.pythonhosted.org/packages/55/38/4fd48ea1bfcb0b6e36d949025200426fe9c3a8bfae029f0973d85
a5a/tensorflow_model_optimization-0.5.0-py2.py3-none-any.whl (172kB)
|██████████| 174kB 23.6MB/s
Requirement already satisfied: kaggle>=1.3.9 in /usr/local/lib/python3.6/dist-packages (from tf-
models-official) (1.5.10)
Requirement already satisfied: scipy>=0.19.1 in /usr/local/lib/python3.6/dist-packages (from tf-
models-official) (1.4.1)
Requirement already satisfied: tensorflow>=2.3.0 in /usr/local/lib/python3.6/dist-packages (from
tf-models-official) (2.3.0)
Requirement already satisfied: pyyaml in /usr/local/lib/python3.6/dist-packages (from tf-models-of
ficial) (3.13)
Requirement already satisfied: six in /usr/local/lib/python3.6/dist-packages (from tf-models-
official) (1.15.0)
Requirement already satisfied: tensorflow-hub>=0.6.0 in /usr/local/lib/python3.6/dist-packages
(from tf-models-official) (0.10.0)
Requirement already satisfied: gin-config in /usr/local/lib/python3.6/dist-packages (from tf-
models-official) (0.4.0)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.6/dist-packages (from tf-
models-official) (3.2.2)
Collecting opencv-python-headless
  Downloading
```

https://files.pythnonnhosted.org/packages/08/e9/5/d809561389884136be6ca7abcc381e501/tezba3481da269a4032/open_cv_python_headless-4.4.0.46-cp36-cp36m-manylinux2014_x86_64.whl (36.7MB)

|██| 36.7MB 119kB/s

Requirement already satisfied: google-cloud-bigquery>=0.31.0 in /usr/local/lib/python3.6/dist-packages (from tf-models-official) (1.21.0)

Requirement already satisfied: google-api-python-client>=1.6.7 in /usr/local/lib/python3.6/dist-packages (from tf-models-official) (1.7.12)

Requirement already satisfied: numpy>=1.15.4 in /usr/local/lib/python3.6/dist-packages (from tf-models-official) (1.18.5)

Requirement already satisfied: absl-py>=0.2.2 in /usr/local/lib/python3.6/dist-packages (from tf-slim>=1.1.0->tf-models-official) (0.10.0)

Requirement already satisfied: python-dateutil>=2.7.3 in /usr/local/lib/python3.6/dist-packages (from pandas>=0.22.0->tf-models-official) (2.8.1)

Requirement already satisfied: pytz>=2017.2 in /usr/local/lib/python3.6/dist-packages (from pandas>=0.22.0->tf-models-official) (2018.9)

Requirement already satisfied: typeguard in /usr/local/lib/python3.6/dist-packages (from tensorflow-addons->tf-models-official) (2.7.1)

Requirement already satisfied: dill in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (0.3.3)

Requirement already satisfied: requests>=2.19.0 in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (2.23.0)

Requirement already satisfied: termcolor in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (1.1.0)

Requirement already satisfied: attrs>=18.1.0 in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (20.3.0)

Requirement already satisfied: dm-tree in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (0.1.5)

Requirement already satisfied: future in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (0.16.0)

Requirement already satisfied: promise in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (2.3)

Requirement already satisfied: tensorflow-metadata in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (0.25.0)

Requirement already satisfied: protobuf>=3.6.1 in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (3.12.4)

Requirement already satisfied: tqdm in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (4.41.1)

Requirement already satisfied: importlib-resources; python_version < "3.9" in /usr/local/lib/python3.6/dist-packages (from tensorflow-datasets->tf-models-official) (3.3.0)

Requirement already satisfied: python-slugify in /usr/local/lib/python3.6/dist-packages (from kaggle>=1.3.9->tf-models-official) (4.0.1)

Requirement already satisfied: urllib3 in /usr/local/lib/python3.6/dist-packages (from kaggle>=1.3.9->tf-models-official) (1.24.3)

Requirement already satisfied: certifi in /usr/local/lib/python3.6/dist-packages (from kaggle>=1.3.9->tf-models-official) (2020.12.5)

Requirement already satisfied: tensorboard<3,>=2.3.0 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (2.3.0)

Requirement already satisfied: wheel>=0.26 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (0.36.1)

Requirement already satisfied: keras-preprocessing<1.2,>=1.1.1 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (1.1.2)

Requirement already satisfied: wrapt>=1.11.1 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (1.12.1)

Requirement already satisfied: h5py<2.11.0,>=2.10.0 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (2.10.0)

Requirement already satisfied: grpcio>=1.8.6 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (1.34.0)

Requirement already satisfied: tensorflow-estimator<2.4.0,>=2.3.0 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (2.3.0)

Requirement already satisfied: google-pasta>=0.1.8 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (0.2.0)

Requirement already satisfied: opt-einsum>=2.3.2 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (3.3.0)

Requirement already satisfied: gast==0.3.3 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (0.3.3)

Requirement already satisfied: astunparse==1.6.3 in /usr/local/lib/python3.6/dist-packages (from tensorflow>=2.3.0->tf-models-official) (1.6.3)

Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.6/dist-packages (from matplotlib->tf-models-official) (1.3.1)

Requirement already satisfied: pyparsing!=2.0.4,!>=2.1.2,!>=2.1.6,>=2.0.1 in /usr/local/lib/python3.6/dist-packages (from matplotlib->tf-models-official) (2.4.7)

Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.6/dist-packages (from matplotlib->tf-models-official) (0.10.0)

Requirement already satisfied: google-cloud-core<2.0dev,>=1.0.3 in /usr/local/lib/python3.6/dist-packages (from google-cloud-bigquery>=0.31.0->tf-models-official) (1.0.3)

Requirement already satisfied: google-resumable-media!=0.4.0,<0.5.0dev,>=0.3.1 in /usr/local/lib/python3.6/dist-packages (from google-cloud-bigquery>=0.31.0->tf-models-official) (0.3.1)

```

.4.1)
Requirement already satisfied: uritemplate<4dev,>=3.0.0 in /usr/local/lib/python3.6/dist-packages
(from google-api-python-client>=1.6.7->tf-models-official) (3.0.1)
Requirement already satisfied: google-auth-httplib2>=0.0.3 in /usr/local/lib/python3.6/dist-
packages (from google-api-python-client>=1.6.7->tf-models-official) (0.0.4)
Requirement already satisfied: httplib2<1dev,>=0.17.0 in /usr/local/lib/python3.6/dist-packages
(from google-api-python-client>=1.6.7->tf-models-official) (0.17.4)
Requirement already satisfied: google-auth>=1.4.1 in /usr/local/lib/python3.6/dist-packages (from
google-api-python-client>=1.6.7->tf-models-official) (1.17.2)
Requirement already satisfied: chardet<4,>=3.0.2 in /usr/local/lib/python3.6/dist-packages (from
requests>=2.19.0->tensorflow-datasets->tf-models-official) (3.0.4)
Requirement already satisfied: idna<3,>=2.5 in /usr/local/lib/python3.6/dist-packages (from
requests>=2.19.0->tensorflow-datasets->tf-models-official) (2.10)
Requirement already satisfied: googleapis-common-protos<2,>=1.52.0 in
/usr/local/lib/python3.6/dist-packages (from tensorflow-metadata->tensorflow-datasets->tf-models-o
fficial) (1.52.0)
Requirement already satisfied: setuptools in /usr/local/lib/python3.6/dist-packages (from
protobuf>=3.6.1->tensorflow-datasets->tf-models-official) (50.3.2)
Requirement already satisfied: zipp>=0.4; python_version < "3.8" in /usr/local/lib/python3.6/dist-
packages (from importlib-resources; python_version < "3.9"->tensorflow-datasets->tf-models-officia
l) (3.4.0)
Requirement already satisfied: text-unidecode>=1.3 in /usr/local/lib/python3.6/dist-packages (from
python-slugify->kaggle>=1.3.9->tf-models-official) (1.3)
Requirement already satisfied: werkzeug>=0.11.15 in /usr/local/lib/python3.6/dist-packages (from
tensorboard<3,>=2.3.0->tensorflow>=2.3.0->tf-models-official) (1.0.1)
Requirement already satisfied: markdown>=2.6.8 in /usr/local/lib/python3.6/dist-packages (from
tensorboard<3,>=2.3.0->tensorflow>=2.3.0->tf-models-official) (3.3.3)
Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in /usr/local/lib/python3.6/dist-p
ackages (from tensorboard<3,>=2.3.0->tensorflow>=2.3.0->tf-models-official) (0.4.2)
Requirement already satisfied: tensorboard-plugin-wit>=1.6.0 in /usr/local/lib/python3.6/dist-
packages (from tensorboard<3,>=2.3.0->tensorflow>=2.3.0->tf-models-official) (1.7.0)
Requirement already satisfied: google-api-core<2.0.0dev,>=1.14.0 in /usr/local/lib/python3.6/dist-
packages (from google-cloud-core<2.0dev,>=1.0.3->google-cloud-bigquery>=0.31.0->tf-models-
official) (1.16.0)
Requirement already satisfied: cachetools<5.0,>=2.0.0 in /usr/local/lib/python3.6/dist-packages
(from google-auth>=1.4.1->google-api-python-client>=1.6.7->tf-models-official) (4.1.1)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.6/dist-packages
(from google-auth>=1.4.1->google-api-python-client>=1.6.7->tf-models-official) (0.2.8)
Requirement already satisfied: rsa<5,>=3.1.4; python_version >= "3" in
/usr/local/lib/python3.6/dist-packages (from google-auth>=1.4.1->google-api-python-client>=1.6.7->
tf-models-official) (4.6)
Requirement already satisfied: importlib-metadata; python_version < "3.8" in
/usr/local/lib/python3.6/dist-packages (from markdown>=2.6.8->tensorboard<3,>=2.3.0-
>tensorflow>=2.3.0->tf-models-official) (3.1.1)
Requirement already satisfied: requests-oauthlib>=0.7.0 in /usr/local/lib/python3.6/dist-packages
(from google-auth-oauthlib<0.5,>=0.4.1->tensorboard<3,>=2.3.0->tensorflow>=2.3.0->tf-models-
official) (1.3.0)
Requirement already satisfied: pyasn1<0.5.0,>=0.4.6 in /usr/local/lib/python3.6/dist-packages
(from pyasn1-modules>=0.2.1->google-auth>=1.4.1->google-api-python-client>=1.6.7->tf-models-offici
al) (0.4.8)
Requirement already satisfied: oauthlib>=3.0.0 in /usr/local/lib/python3.6/dist-packages (from
requests-oauthlib>=0.7.0->google-auth-oauthlib<0.5,>=0.4.1->tensorboard<3,>=2.3.0-
>tensorflow>=2.3.0->tf-models-official) (3.1.0)
Building wheels for collected packages: py-cpuinfo
  Building wheel for py-cpuinfo (setup.py) ... done
  Created wheel for py-cpuinfo: filename=py_cpuinfo-7.0.0-cp36-none-any.whl size=20071
sha256=5d79a70bleef29647259108766005146464cc57e42f3bd4859b3f7880471ce1e
  Stored in directory:
/root/.cache/pip/wheels/f1/93/7b/127daf0c3a5a49feb2fec468d508067c733fba5192f726ad1
Successfully built py-cpuinfo
Installing collected packages: sentencepiece, py-cpuinfo, tensorflow-model-optimization, opencv-py
thon-headless, tf-models-official
Successfully installed opencv-python-headless-4.4.0.46 py-cpuinfo-7.0.0 sentencepiece-0.1.94 tenso
rflow-model-optimization-0.5.0 tf-models-official-2.3.0

```

In []:

```
%cd '/content/models/research/'

!protoc object_detection/protos/*.proto --python_out=.
!python setup.py build
!python setup.py install

os.environ['PYTHONPATH'] += ':/content/models/research/:/content/models/research/slim'
```

/content/models/research

```
running build
running build_py
creating build
creating build/lib
creating build/lib/object_detection
copying object_detection/exporter_tf1_test.py -> build/lib/object_detection
copying object_detection/model_hparams.py -> build/lib/object_detection
copying object_detection/__init__.py -> build/lib/object_detection
copying object_detection/eval_util_test.py -> build/lib/object_detection
copying object_detection/exporter_lib_v2.py -> build/lib/object_detection
copying object_detection/export_tflite_graph_lib_tf2_test.py -> build/lib/object_detection
copying object_detection/model_tpu_main.py -> build/lib/object_detection
copying object_detection/model_lib_tf1_test.py -> build/lib/object_detection
copying object_detection/export_tflite_graph_lib_tf2.py -> build/lib/object_detection
copying object_detection/model_lib.py -> build/lib/object_detection
copying object_detection/exporter.py -> build/lib/object_detection
copying object_detection/export_inference_graph.py -> build/lib/object_detection
copying object_detection/export_tflite_ssd_graph.py -> build/lib/object_detection
copying object_detection/inputs.py -> build/lib/object_detection
copying object_detection/export_tflite_ssd_graph_lib_tf1_test.py -> build/lib/object_detection
copying object_detection/export_tflite_graph_tf2.py -> build/lib/object_detection
copying object_detection/exporter_main_v2.py -> build/lib/object_detection
copying object_detection/model_main.py -> build/lib/object_detection
copying object_detection/model_lib_v2.py -> build/lib/object_detection
copying object_detection/model_lib_tf2_test.py -> build/lib/object_detection
copying object_detection/inputs_test.py -> build/lib/object_detection
copying object_detection/export_tflite_ssd_graph_lib.py -> build/lib/object_detection
copying object_detection/eval_util.py -> build/lib/object_detection
copying object_detection/exporter_lib_tf2_test.py -> build/lib/object_detection
copying object_detection/model_main_tf2.py -> build/lib/object_detection
creating build/lib/object_detection/utils
copying object_detection/utils/np_box_mask_list_ops_test.py -> build/lib/object_detection/utils
copying object_detection/utils/object_detection_evaluation_test.py ->
build/lib/object_detection/utils
copying object_detection/utils/np_box_ops.py -> build/lib/object_detection/utils
copying object_detection/utils/context_manager_test.py -> build/lib/object_detection/utils
copying object_detection/utils/target_assigner_utils.py -> build/lib/object_detection/utils
copying object_detection/utils/variables_helper_tf1_test.py -> build/lib/object_detection/utils
copying object_detection/utils/category_util_test.py -> build/lib/object_detection/utils
copying object_detection/utils/config_util.py -> build/lib/object_detection/utils
copying object_detection/utils/shape_utils.py -> build/lib/object_detection/utils
copying object_detection/utils/config_util_test.py -> build/lib/object_detection/utils
copying object_detection/utils/label_map_util_test.py -> build/lib/object_detection/utils
copying object_detection/utils/dataset_util.py -> build/lib/object_detection/utils
copying object_detection/utils/metrics.py -> build/lib/object_detection/utils
copying object_detection/utils/ops.py -> build/lib/object_detection/utils
copying object_detection/utils/bifpn_utils.py -> build/lib/object_detection/utils
copying object_detection/utils/test_case.py -> build/lib/object_detection/utils
copying object_detection/utils/__init__.py -> build/lib/object_detection/utils
copying object_detection/utils/np_box_ops_test.py -> build/lib/object_detection/utils
copying object_detection/utils/per_image_vrd_evaluation_test.py ->
build/lib/object_detection/utils
copying object_detection/utils/per_image_evaluation_test.py -> build/lib/object_detection/utils
copying object_detection/utils/context_manager.py -> build/lib/object_detection/utils
copying object_detection/utils/test_utils.py -> build/lib/object_detection/utils
copying object_detection/utils/static_shape.py -> build/lib/object_detection/utils
copying object_detection/utils/per_image_vrd_evaluation.py -> build/lib/object_detection/utils
copying object_detection/utils/test_case_test.py -> build/lib/object_detection/utils
copying object_detection/utils/learning_schedules.py -> build/lib/object_detection/utils
copying object_detection/utils/np_box_list_ops_test.py -> build/lib/object_detection/utils
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copying object_detection/utils/label_map_util.py -> build/lib/object_detection/utils
copying object_detection/utils/model_util_tf2_test.py -> build/lib/object_detection/utils
copying object_detection/utils/np_box_list_test.py -> build/lib/object_detection/utils
copying object_detection/utils/object_detection_evaluation.py -> build/lib/object_detection/utils
copying object_detection/utils/learning_schedules_test.py -> build/lib/object_detection/utils
copying object_detection/utils/spatial_transform_ops_test.py -> build/lib/object_detection/utils
copying object_detection/utils/dataset_util_test.py -> build/lib/object_detection/utils
copying object_detection/utils/target_assigner_utils_test.py -> build/lib/object_detection/utils
copying object_detection/utils/vrd_evaluation_test.py -> build/lib/object_detection/utils
copying object_detection/utils/visualization_utils_test.py -> build/lib/object_detection/utils
copying object_detection/utils/json_utils.py -> build/lib/object_detection/utils
copying object_detection/utils/spatial_transform_ops.py -> build/lib/object_detection/utils
copying object_detection/utils/np_box_mask_list_test.py -> build/lib/object_detection/utils
copying object_detection/utils/np_box_mask_list.py -> build/lib/object_detection/utils
copying object_detection/utils/np_box_list_ops.py -> build/lib/object_detection/utils
copying object_detection/utils/colab_utils.py -> build/lib/object_detection/utils
```

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copying object_detection/utils/variables_helper.py -> build/lib/object_detection/utils
copying object_detection/utils/autoaugment_utils.py -> build/lib/object_detection/utils
copying object_detection/utils/np_mask_ops.py -> build/lib/object_detection/utils
copying object_detection/utils/shape_utils_test.py -> build/lib/object_detection/utils
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copying object_detection/utils/metrics_test.py -> build/lib/object_detection/utils
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copying object_detection/utils/tf_version.py -> build/lib/object_detection/utils
copying object_detection/utils/per_image_evaluation.py -> build/lib/object_detection/utils
copying object_detection/utils/patch_ops_test.py -> build/lib/object_detection/utils
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copying object_detection/utils/vrd_evaluation.py -> build/lib/object_detection/utils
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copying object_detection/utils/np_box_mask_list_ops.py -> build/lib/object_detection/utils
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build/lib/object_detection/inference
copying object_detection/inference/__init__.py -> build/lib/object_detection/inference
copying object_detection/inference/detection_inference.py -> build/lib/object_detection/inference
copying object_detection/inference/infer_detections.py -> build/lib/object_detection/inference
creating build/lib/object_detection/builders
copying object_detection/builders/input_reader_builder.py -> build/lib/object_detection/builders
copying object_detection/builders/region_similarity_calculator_builder.py ->
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copying object_detection/builders/losses_builder_test.py -> build/lib/object_detection/builders
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copying object_detection/builders/hyperparams_builder_test.py ->
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copying object_detection/builders/_object_builder.py -> build/lib/object_detection/builders
copying object_detection/builders/anchor_generator_builder.py ->
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copying object_detection/builders/matcher_builder.py -> build/lib/object_detection/builders
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creating build/lib/object_detection/models
copying object_detection/models/faster_rcnn_inception_v2_feature_extractor_tf1_test.py ->
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copying object_detection/models/faster_rcnn_resnet_v1_feature_extractor.py ->
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copying object_detection/models/center_net_mobilenet_v2_feature_extractor.py ->
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copying object_detection/models/ssd_mobilenet_v1_feature_extractor_tf2_test.py ->
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copying object_detection/models/ssd_inception_v3_feature_extractor.py ->
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copying object_detection/models/ssd_resnet_v1_ppn_feature_extractor_tf1_test.py ->
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copying object_detection/models/faster_rcnn_resnet_v1_feature_extractor_tf1_test.py ->
build/lib/object_detection/models
copying object_detection/models/_init_.py -> build/lib/object_detection/models
copying object_detection/models/ssd_mobiledet_feature_extractor.py ->
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copying object_detection/models/embedded_ssd_mobilenet_v1_feature_extractor.py ->
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copying object_detection/models/ssd_mobilenet_v2_mnasfpn_feature_extractor_tf1_test.py ->
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ld/lib/object_detection/models
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copying object_detection/models/ssd_resnet_v1_ppn_feature_extractor_testbase.py ->
build/lib/object_detection/models
copying object_detection/models/ssd_inception_v2_feature_extractor.py ->
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copying object_detection/models/ssd_mobilenet_v2_fpn_keras_feature_extractor.py ->
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copying object_detection/tpu_exporters/utils_test.py -> build/lib/object_detection/tpu_exporters
copying object_detection/tpu_exporters/__init__.py -> build/lib/object_detection/tpu_exporters
copying object_detection/tpu_exporters/export_saved_model_tpu.py ->
build/lib/object_detection/tpu_exporters
copying object_detection/tpu_exporters/export_saved_model_tpu_lib_tf1_test.py ->
build/lib/object_detection/tpu_exporters
copying object_detection/tpu_exporters/export_saved_model_tpu_lib.py ->
build/lib/object_detection/tpu_exporters
copying object_detection/tpu_exporters/utils.py -> build/lib/object_detection/tpu_exporters
copying object_detection/tpu_exporters/ssd.py -> build/lib/object_detection/tpu_exporters
copying object_detection/tpu_exporters/faster_rcnn.py -> build/lib/object_detection/tpu_exporters
creating build/lib/object_detection/protos
copying object_detection/protos/eval_pb2.py -> build/lib/object_detection/protos
copying object_detection/protos/flexible_grid_anchor_generator_pb2.py ->
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copying object_detection/protos/calibration_pb2.py -> build/lib/object_detection/protos
copying object_detection/protos/matcher_pb2.py -> build/lib/object_detection/protos
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copying object_detection/protos/ssd_anchor_generator_pb2.py -> build/lib/object_detection/protos
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copying object_detection/protos/target_assigner_pb2.py -> build/lib/object_detection/protos
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build/lib/object_detection/protos
copying object_detection/protos/losses_pb2.py -> build/lib/object_detection/protos
copying object_detection/protos/train_pb2.py -> build/lib/object_detection/protos
copying object_detection/protos/keypoint_box_coder_pb2.py -> build/lib/object_detection/protos
copying object_detection/protos/bipartite_matcher_pb2.py -> build/lib/object_detection/protos
copying object_detection/protos/image_resizer_pb2.py -> build/lib/object_detection/protos
copying object_detection/protos/region_similarity_calculator_pb2.py ->
build/lib/object_detection/protos
copying object_detection/protos/graph_rewriter_pb2.py -> build/lib/object_detection/protos
creating build/lib/object_detection/data_decoders
copying object_detection/data_decoders/__init__.py -> build/lib/object_detection/data_decoders
copying object_detection/data_decoders/tf_example_decoder.py ->
build/lib/object_detection/data_decoders
copying object_detection/data_decoders/tf_sequence_example_decoder.py ->
build/lib/object_detection/data_decoders
copying object_detection/data_decoders/tf_sequence_example_decoder_test.py ->
build/lib/object_detection/data_decoders
copying object_detection/data_decoders/tf_example_decoder_test.py ->
build/lib/object_detection/data_decoders
creating build/lib/object_detection/legacy
copying object_detection/legacy/__init__.py -> build/lib/object_detection/legacy
copying object_detection/legacy/evaluator.py -> build/lib/object_detection/legacy
copying object_detection/legacy/eval.py -> build/lib/object_detection/legacy
copying object_detection/legacy/trainer.py -> build/lib/object_detection/legacy
```

```
copying object_detection/legacy/trainer.py -> build/lib/object_detection/legacy
copying object_detection/legacy/train.py -> build/lib/object_detection/legacy
copying object_detection/legacy/trainer_tf1_test.py -> build/lib/object_detection/legacy
creating build/lib/object_detection/metrics
copying object_detection/metrics/calibration_evaluation.py -> build/lib/object_detection/metrics
copying object_detection/metrics/oid_challenge_evaluation_utils.py ->
build/lib/object_detection/metrics
copying object_detection/metrics/calibration_evaluation_tf1_test.py ->
build/lib/object_detection/metrics
copying object_detection/metrics/__init__.py -> build/lib/object_detection/metrics
copying object_detection/metrics/oid_vrd_challenge_evaluation_utils.py ->
build/lib/object_detection/metrics
copying object_detection/metrics/oid_vrd_challenge_evaluation.py ->
build/lib/object_detection/metrics
copying object_detection/metrics/io_utils.py -> build/lib/object_detection/metrics
copying object_detection/metrics/calibration_metrics_tf1_test.py ->
build/lib/object_detection/metrics
copying object_detection/metrics/coco_tools.py -> build/lib/object_detection/metrics
copying object_detection/metrics/offline_eval_map_corloc.py -> build/lib/object_detection/metrics
copying object_detection/metrics/calibration_metrics.py -> build/lib/object_detection/metrics
copying object_detection/metrics/oid_challenge_evaluation.py -> build/lib/object_detection/metrics
copying object_detection/metrics/coco_evaluation.py -> build/lib/object_detection/metrics
copying object_detection/metrics/lvis_tools_test.py -> build/lib/object_detection/metrics
copying object_detection/metrics/offline_eval_map_corloc_test.py ->
build/lib/object_detection/metrics
copying object_detection/metrics/lvis_evaluation_test.py -> build/lib/object_detection/metrics
copying object_detection/metrics/lvis_evaluation.py -> build/lib/object_detection/metrics
copying object_detection/metrics/oid_challenge_evaluation_utils_test.py ->
build/lib/object_detection/metrics
copying object_detection/metrics/coco_evaluation_test.py -> build/lib/object_detection/metrics
copying object_detection/metrics/lvis_tools.py -> build/lib/object_detection/metrics
copying object_detection/metrics/coco_tools_test.py -> build/lib/object_detection/metrics
copying object_detection/metrics/tf_example_parser_test.py -> build/lib/object_detection/metrics
copying object_detection/metrics/tf_example_parser.py -> build/lib/object_detection/metrics
copying object_detection/metrics/oid_vrd_challenge_evaluation_utils_test.py ->
build/lib/object_detection/metrics
creating build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/seq_example_util_test.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/oid_tfrecord_creation_test.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/create_pascal_tf_record.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/__init__.py -> build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/create_oid_tf_record.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/oid_tfrecord_creation.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/oid_hierarchical_labels_expansion_test.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/seq_example_util.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/tf_record_creation_util.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/create_ava_actions_tf_record.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/tf_record_creation_util_test.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/create_pascal_tf_record_test.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/create_coco_tf_record.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/create_coco_tf_record_test.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/create_pet_tf_record.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/oid_hierarchical_labels_expansion.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/create_kitti_tf_record_test.py ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/create_kitti_tf_record.py ->
build/lib/object_detection/dataset_tools
creating build/lib/object_detection/box_coders
copying object_detection/box_coders/keypoint_box_coder_test.py ->
build/lib/object_detection/box_coders
copying object_detection/box_coders/__init__.py -> build/lib/object_detection/box_coders
copying object_detection/box_coders/keypoint_box_coder.py -> build/lib/object_detection/box_coders
```

```
copying object_detection/box_coders/square_box_coder.py -> build/lib/object_detection/box_coders
copying object_detection/box_coders/faster_rcnn_box_coder_test.py ->
build/lib/object_detection/box_coders
copying object_detection/box_coders/mean_stddev_box_coder_test.py ->
build/lib/object_detection/box_coders
copying object_detection/box_coders/mean_stddev_box_coder.py ->
build/lib/object_detection/box_coders
copying object_detection/box_coders/square_box_coder_test.py ->
build/lib/object_detection/box_coders
copying object_detection/box_coders/faster_rcnn_box_coder.py ->
build/lib/object_detection/box_coders
creating build/lib/object_detection/matchers
copying object_detection/matchers/bipartite_matcher.py -> build/lib/object_detection/matchers
copying object_detection/matchers/argmax_matcher.py -> build/lib/object_detection/matchers
copying object_detection/matchers/__init__.py -> build/lib/object_detection/matchers
copying object_detection/matchers/hungarian_matcher.py -> build/lib/object_detection/matchers
copying object_detection/matchers/argmax_matcher_test.py -> build/lib/object_detection/matchers
copying object_detection/matchers/bipartite_matcher_tf1_test.py ->
build/lib/object_detection/matchers
copying object_detection/matchers/hungarian_matcher_tf2_test.py ->
build/lib/object_detection/matchers
creating build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/context_rcnn_lib_tf2.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/rfcn_meta_arch_test.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/__init__.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/ssd_meta_arch.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/center_net_meta_arch_tf2_test.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/faster_rcnn_meta_arch_test_lib.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/faster_rcnn_meta_arch.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/center_net_meta_arch.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/context_rcnn_meta_arch_test.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/faster_rcnn_meta_arch_test.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/ssd_meta_arch_test_lib.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/context_rcnn_lib.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/context_rcnn_lib_tf2_test.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/context_rcnn_meta_arch.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/ssd_meta_arch_test.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/context_rcnn_lib_tf1_test.py ->
build/lib/object_detection/meta_architectures
copying object_detection/meta_architectures/rfcn_meta_arch.py ->
build/lib/object_detection/meta_architectures
creating build/lib/object_detection/core
copying object_detection/core/batch_multiclass_nms_test.py -> build/lib/object_detection/core
copying object_detection/core/preprocessor_test.py -> build/lib/object_detection/core
copying object_detection/core/data_parser.py -> build/lib/object_detection/core
copying object_detection/core/freezable_batch_norm_tf2_test.py -> build/lib/object_detection/core
copying object_detection/core/prefetcher_tf1_test.py -> build/lib/object_detection/core
copying object_detection/core/anchor_generator.py -> build/lib/object_detection/core
copying object_detection/core/standard_fields.py -> build/lib/object_detection/core
copying object_detection/core/class_agnostic_nms_test.py -> build/lib/object_detection/core
copying object_detection/core/__init__.py -> build/lib/object_detection/core
copying object_detection/core/keypoint_ops.py -> build/lib/object_detection/core
copying object_detection/core/box_coder.py -> build/lib/object_detection/core
copying object_detection/core/minibatch_sampler_test.py -> build/lib/object_detection/core
copying object_detection/core/data_decoder.py -> build/lib/object_detection/core
copying object_detection/core/box_list_ops.py -> build/lib/object_detection/core
copying object_detection/core/box_list_test.py -> build/lib/object_detection/core
copying object_detection/core/box_predictor.py -> build/lib/object_detection/core
copying object_detection/core/box_list.py -> build/lib/object_detection/core
copying object_detection/core/matcher.py -> build/lib/object_detection/core
copying object_detection/core/freezable_batch_norm.py -> build/lib/object_detection/core
copying object_detection/core/preprocessor_cache.py -> build/lib/object_detection/core
```

```
copying object_detection/core/batcher.py -> build/lib/object_detection/core
copying object_detection/core/balanced_positive_negative_sampler_test.py ->
build/lib/object_detection/core
copying object_detection/core/densepose_ops.py -> build/lib/object_detection/core
copying object_detection/core/target_assigner_test.py -> build/lib/object_detection/core
copying object_detection/core/model.py -> build/lib/object_detection/core
copying object_detection/core/matcher_test.py -> build/lib/object_detection/core
copying object_detection/core/model_test.py -> build/lib/object_detection/core
copying object_detection/core/region_similarity_calculator_test.py ->
build/lib/object_detection/core
copying object_detection/core/balanced_positive_negative_sampler.py ->
build/lib/object_detection/core
copying object_detection/core/box_coder_test.py -> build/lib/object_detection/core
copying object_detection/core/multiclass_nms_test.py -> build/lib/object_detection/core
copying object_detection/core/keypoint_ops_test.py -> build/lib/object_detection/core
copying object_detection/core/prefetcher.py -> build/lib/object_detection/core
copying object_detection/core/densepose_ops_test.py -> build/lib/object_detection/core
copying object_detection/core/batcher_tf1_test.py -> build/lib/object_detection/core
copying object_detection/core/post_processing.py -> build/lib/object_detection/core
copying object_detection/core/losses.py -> build/lib/object_detection/core
copying object_detection/core/preprocessor.py -> build/lib/object_detection/core
copying object_detection/core/minibatch_sampler.py -> build/lib/object_detection/core
copying object_detection/core/box_list_ops_test.py -> build/lib/object_detection/core
copying object_detection/core/losses_test.py -> build/lib/object_detection/core
copying object_detection/core/region_similarity_calculator.py -> build/lib/object_detection/core
copying object_detection/core/target_assigner.py -> build/lib/object_detection/core
creating build/lib/object_detection/anchor_generators
copying object_detection/anchor_generators/multiple_grid_anchor_generator.py ->
build/lib/object_detection/anchor_generators
copying object_detection/anchor_generators/grid_anchor_generator.py ->
build/lib/object_detection/anchor_generators
copying object_detection/anchor_generators/__init__.py ->
build/lib/object_detection/anchor_generators
copying object_detection/anchor_generators/multiscale_grid_anchor_generator_test.py ->
build/lib/object_detection/anchor_generators
copying object_detection/anchor_generators/multiscale_grid_anchor_generator.py ->
build/lib/object_detection/anchor_generators
copying object_detection/anchor_generators/multiple_grid_anchor_generator_test.py ->
build/lib/object_detection/anchor_generators
copying object_detection/anchor_generators/flexible_grid_anchor_generator.py ->
build/lib/object_detection/anchor_generators
copying object_detection/anchor_generators/flexible_grid_anchor_generator_test.py ->
build/lib/object_detection/anchor_generators
copying object_detection/anchor_generators/grid_anchor_generator_test.py ->
build/lib/object_detection/anchor_generators
creating build/lib/object_detection/predictors
copying object_detection/predictors/mask_rcnn_keras_box_predictor_tf2_test.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/__init__.py -> build/lib/object_detection/predictors
copying object_detection/predictors/rfcn_box_predictor.py -> build/lib/object_detection/predictors
copying object_detection/predictors/convolutional_keras_box_predictor.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/convolutional_keras_box_predictor_tf2_test.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/mask_rcnn_box_predictor_tf1_test.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/mask_rcnn_keras_box_predictor.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/rfcn_box_predictor_tf1_test.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/rfcn_keras_box_predictor_tf2_test.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/convolutional_box_predictor.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/mask_rcnn_box_predictor.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/rfcn_keras_box_predictor.py ->
build/lib/object_detection/predictors
copying object_detection/predictors/convolutional_box_predictor_tf1_test.py ->
build/lib/object_detection/predictors
creating build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/mobilenet_v1_tf2_test.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/convert_keras_models.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/mobilenet_v1.py ->
build/lib/object_detection/models/keras_models
```

```
copying object_detection/models/keras_models/__init__.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/resnet_v1.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/test_utils.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/mobilenet_v2.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/inception_resnet_v2.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/hourglass_network_tf2_test.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/inception_resnet_v2_tf2_test.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/mobilenet_v2_tf2_test.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/model_utils.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/hourglass_network.py ->
build/lib/object_detection/models/keras_models
copying object_detection/models/keras_models/resnet_v1_tf2_test.py ->
build/lib/object_detection/models/keras_models
creating build/lib/object_detection/tpu_exporters/testdata
copying object_detection/tpu_exporters/testdata/__init__.py ->
build/lib/object_detection/tpu_exporters/testdata
creating build/lib/object_detection/dataset_tools/context_rcnn
copying object_detection/dataset_tools/context_rcnn/generate_embedding_data_tf2_test.py ->
build/lib/object_detection/dataset_tools/context_rcnn
copying object_detection/dataset_tools/context_rcnn/__init__.py ->
build/lib/object_detection/dataset_tools/context_rcnn
copying object_detection/dataset_tools/context_rcnn/add_context_to_examples.py ->
build/lib/object_detection/dataset_tools/context_rcnn
copying object_detection/dataset_tools/context_rcnn/create_cococameratraps_tfexample_tf2_test.py -> build/lib/object_detection/dataset_tools/context_rcnn
copying object_detection/dataset_tools/context_rcnn/generate_detection_data_tf2_test.py ->
build/lib/object_detection/dataset_tools/context_rcnn
copying object_detection/dataset_tools/context_rcnn/create_cococameratraps_tfexample_main.py -> build/lib/object_detection/dataset_tools/context_rcnn
copying object_detection/dataset_tools/context_rcnn/add_context_to_examples_tf2_test.py ->
build/lib/object_detection/dataset_tools/context_rcnn
copying object_detection/dataset_tools/context_rcnn/generate_detection_data.py ->
build/lib/object_detection/dataset_tools/context_rcnn
copying object_detection/dataset_tools/context_rcnn/generate_embedding_data.py ->
build/lib/object_detection/dataset_tools/context_rcnn
creating build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/keras_box_head_tf2_test.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/box_head_tf1_test.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/__init__.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/mask_head.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/keras_box_head.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/head.py -> build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/keypoint_head.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/class_head_tf1_test.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/keras_mask_head.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/keras_class_head.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/box_head.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/class_head.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/keypoint_head_tf1_test.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/mask_head_tf1_test.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/keras_class_head_tf2_test.py ->
build/lib/object_detection/predictors/heads
copying object_detection/predictors/heads/keras_mask_head_tf2_test.py ->
build/lib/object_detection/predictors/heads
running egg_info
```

```
creating object_detection.egg-info
writing object_detection.egg-info/PKG-INFO
writing dependency_links to object_detection.egg-info/dependency_links.txt
writing requirements to object_detection.egg-info/requirements.txt
writing top-level names to object_detection.egg-info/top_level.txt
writing manifest file 'object_detection.egg-info/SOURCES.txt'
writing manifest file 'object_detection.egg-info/SOURCES.txt'
copying object_detection/CONTRIBUTING.md -> build/lib/object_detection
copying object_detection/README.md -> build/lib/object_detection
creating build/lib/object_detection/colab_tutorials
copying object_detection/colab_tutorials/context_rcnn_tutorial.ipynb ->
build/lib/object_detection/colab_tutorials
copying object_detection/colab_tutorials/eager_few_shot_od_training_tf2_colab.ipynb ->
build/lib/object_detection/colab_tutorials
copying object_detection/colab_tutorials/eager_few_shot_od_training_tflite.ipynb ->
build/lib/object_detection/colab_tutorials
copying object_detection/colab_tutorials/inference_from_saved_model_tf2_colab.ipynb ->
build/lib/object_detection/colab_tutorials
copying object_detection/colab_tutorials/inference_tf2_colab.ipynb ->
build/lib/object_detection/colab_tutorials
copying object_detection/colab_tutorials/object_detection_tutorial.ipynb ->
build/lib/object_detection/colab_tutorials
creating build/lib/object_detection/configs
creating build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/centernet_hourglass104_1024x1024_coco17_tpu-32.config -> buil
d/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/centernet_hourglass104_1024x1024_kpts_coco17_tpu-32.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/centernet_hourglass104_512x512_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/centernet_hourglass104_512x512_kpts_coco17_tpu-32.config -> b
uild/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/centernet_resnet101_v1_fpn_512x512_coco17_tpu-8.config -> bui
ld/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/centernet_resnet50_v1_fpn_512x512_kpts_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/centernet_resnet50_v2_512x512_kpts_coco17_tpu-8.config -> bui
ld/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/faster_rcnn_resnet101_v1_1024x1024_coco17_tpu-8.config -> bui
ld/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/faster_rcnn_resnet101_v1_640x640_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/faster_rcnn_resnet101_v1_800x1333_coco17_gpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/faster_rcnn_resnet152_v1_1024x1024_coco17_tpu-8.config -> bui
ld/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/faster_rcnn_resnet152_v1_640x640_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/faster_rcnn_resnet152_v1_800x1333_coco17_gpu-8.config ->
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copying object_detection/configs/tf2/faster_rcnn_resnet50_v1_1024x1024_coco17_tpu-8.config ->
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copying object_detection/configs/tf2/faster_rcnn_resnet50_v1_640x640_coco17_tpu-8.config ->
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copying object_detection/configs/tf2/faster_rcnn_resnet50_v1_fpn_640x640_coco17_tpu-8.config -> bu
ild/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/mask_rcnn_inception_resnet_v2_1024x1024_coco17_gpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_efficientdet_d0_512x512_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_efficientdet_d1_640x640_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_efficientdet_d2_768x768_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_efficientdet_d3_896x896_coco17_tpu-32.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_efficientdet_d4_1024x1024_coco17_tpu-32.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_efficientdet_d5_1280x1280_coco17_tpu-32.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_efficientdet_d6_1408x1408_coco17_tpu-32.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_efficientdet_d7_1536x1536_coco17_tpu-32.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_mobilenet_v1_fpn_640x640_coco17_tpu-8.config ->
```

```
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_mobilenet_v2_320x320_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_mobilenet_v2_fpnlite_320x320_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_resnet101_v1_fpn_1024x1024_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_resnet101_v1_fpn_640x640_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_resnet152_v1_fpn_1024x1024_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_resnet152_v1_fpn_640x640_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
copying object_detection/configs/tf2/ssd_resnet50_v1_fpn_1024x1024_coco17_tpu-8.config ->
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copying object_detection/configs/tf2/ssd_resnet50_v1_fpn_640x640_coco17_tpu-8.config ->
build/lib/object_detection/configs/tf2
creating build/lib/object_detection/data
copying object_detection/data/ava_label_map_v2.1.pbtxt -> build/lib/object_detection/data
copying object_detection/data/face_label_map.pbtxt -> build/lib/object_detection/data
copying object_detection/data/face_person_with_keypoints_label_map.pbtxt ->
build/lib/object_detection/data
copying object_detection/data/fgvc_2854_classes_label_map.pbtxt -> build/lib/object_detection/data
copying object_detection/data/kitti_label_map.pbtxt -> build/lib/object_detection/data
copying object_detection/data/mscoco_complete_label_map.pbtxt -> build/lib/object_detection/data
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copying object_detection/data/oid_bbox_trainable_label_map.pbtxt ->
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build/lib/object_detection/data
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copying object_detection/data/pascal_label_map.pbtxt -> build/lib/object_detection/data
copying object_detection/data/pet_label_map.pbtxt -> build/lib/object_detection/data
copying object_detection/data/snapshot_serengeti_label_map.pbtxt ->
build/lib/object_detection/data
creating build/lib/object_detection/dockerfiles
creating build/lib/object_detection/dockerfiles/android
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build/lib/object_detection/dockerfiles/android
copying object_detection/dockerfiles/android/README.md ->
build/lib/object_detection/dockerfiles/android
creating build/lib/object_detection/dockerfiles/tf1
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copying object_detection/g3doc/defining_your_own_model.md -> build/lib/object_detection/g3doc
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copying object_detection/g3doc/running_on_mobile_tensorflowlite.md ->
build/lib/object_detection/g3doc
copying object_detection/g3doc/running_on_mobile_tf2.md -> build/lib/object_detection/g3doc
copying object_detection/g3doc/running_pets.md -> build/lib/object_detection/g3doc
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copying object_detection/g3doc/tf1_detection_zoo.md -> build/lib/object_detection/g3doc
copying object_detection/g3doc/tf1_training_and_evaluation.md -> build/lib/object_detection/g3doc
copying object_detection/g3doc/tf2.md -> build/lib/object_detection/g3doc
copying object_detection/g3doc/tf2_classification_zoo.md -> build/lib/object_detection/g3doc
copying object_detection/g3doc/tf2_detection_zoo.md -> build/lib/object_detection/g3doc
copying object_detection/g3doc/tf2_training_and_evaluation.md -> build/lib/object_detection/g3doc
copying object_detection/g3doc/tpu_compatibility.md -> build/lib/object_detection/g3doc
copying object_detection/g3doc/tpu_exporters.md -> build/lib/object_detection/g3doc
copying object_detection/g3doc/using_your_own_dataset.md -> build/lib/object_detection/g3doc
```

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creating build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/dogs_detections_output.jpg ->
build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/example_cat.jpg -> build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/groupof_case_eval.png -> build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/kites_detections_output.jpg ->
build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/kites_with_segment_overlay.png ->
build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/nongroupof_case_eval.png ->
build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/oid_bus_72e19c28aac34ed8.jpg ->
build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/oid_monkey_3b4168c89cecbc5b.jpg ->
build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/oxford_pet.png -> build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/tensorboard.png -> build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/tensorboard2.png -> build/lib/object_detection/g3doc/img
copying object_detection/g3doc/img/tf-od-api-logo.png -> build/lib/object_detection/g3doc/img
creating build/lib/object_detection/packages
creating build/lib/object_detection/packages/tf1
copying object_detection/packages/tf1/setup.py -> build/lib/object_detection/packages/tf1
creating build/lib/object_detection/packages/tf2
copying object_detection/packages/tf2/setup.py -> build/lib/object_detection/packages/tf2
creating build/lib/object_detection/samples
creating build/lib/object_detection/samples/cloud
copying object_detection/samples/cloud/cloud.yml -> build/lib/object_detection/samples/cloud
creating build/lib/object_detection/samples/configs
copying object_detection/samples/configs/context_rcnn_resnet101_snapshot_serengeti.config ->
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copying object_detection/samples/configs/context_rcnn_resnet101_snapshot_serengeti_sync.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/embedded_ssd_mobilenet_v1_coco.config ->
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object_detection/samples/configs/facessd_mobilenet_v2_quantized_320x320_open_image_v4.config -> bu
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copying object_detection/samples/configs/faster_rcnn_inception_resnet_v2_atrous_coco.config -> bui
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object_detection/samples/configs/faster_rcnn_inception_resnet_v2_atrous_lr_coco.config -> b
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copying object_detection/samples/configs/faster_rcnn_inception_resnet_v2_atrous_oid.config ->
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copying object_detection/samples/configs/faster_rcnn_inception_resnet_v2_atrous_oid_v4.config -> b
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copying object_detection/samples/configs/faster_rcnn_inception_resnet_v2_atrous_pets.config -> bui
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build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_inception_v2_pets.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_nas_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet101_atrous_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet101_ava_v2.1.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet101_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet101_fgvc.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet101_kitti.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet101_pets.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet101_voc07.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet152_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet152_pets.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet50_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet50_fgvc.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/faster_rcnn_resnet50_pets.config ->
```

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build/lib/object_detection/samples/configs
copying object_detection/samples/configs/mask_rcnn_inception_resnet_v2_atrous_coco.config ->
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copying object_detection/samples/configs/mask_rcnn_inception_v2_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/mask_rcnn_resnet101_atrous_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/mask_rcnn_resnet101_pets.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/mask_rcnn_resnet50_atrous_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/rfcn_resnet101_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/rfcn_resnet101_pets.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_inception_v2_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_inception_v2_pets.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v1_0.75_depth_300x300_coco14_sync.config ->
build/lib/object_detection/samples/configs
copying
object_detection/samples/configs/ssd_mobilenet_v1_0.75_depth_quantized_300x300_coco14_sync.config
-> build/lib/object_detection/samples/configs
copying
object_detection/samples/configs/ssd_mobilenet_v1_0.75_depth_quantized_300x300_pets_sync.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v1_300x300_coco14_sync.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v1_coco.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v1_focal_loss_pets.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v1_focal_loss_pets_inference.config ->
build/lib/object_detection/samples/configs
copying
object_detection/samples/configs/ssd_mobilenet_v1_fpn_shared_box_predictor_640x640_coco14_sync.config
-> build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v1_pets.config ->
build/lib/object_detection/samples/configs
copying
object_detection/samples/configs/ssd_mobilenet_v1_ppn_shared_box_predictor_300x300_coco14_sync.config
-> build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v1_quantized_300x300_coco14_sync.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v2_coco.config ->
build/lib/object_detection/samples/configs
copying
object_detection/samples/configs/ssd_mobilenet_v2_fpnlite_quantized_shared_box_predictor_256x256_de
ultiplier_75_coco14_sync.config -> build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v2_fullyconv_coco.config ->
build/lib/object_detection/samples/configs
copying
object_detection/samples/configs/ssd_mobilenet_v2_mnasfpn_shared_box_predictor_320x320_coco_sync.config
-> build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v2_oid_v4.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v2_pets_keras.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssd_mobilenet_v2_quantized_300x300_coco.config ->
build/lib/object_detection/samples/configs
copying
object_detection/samples/configs/ssd_resnet101_v1_fpn_shared_box_predictor_oid_512x512_sync.config
-> build/lib/object_detection/samples/configs
copying
object_detection/samples/configs/ssd_resnet50_v1_fpn_shared_box_predictor_640x640_coco14_sync.config
-> build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssdlite_mobiledet_cpu_320x320_coco_sync_4x4.config -> bui
ld/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssdlite_mobiledet_dsp_320x320_coco_sync_4x4.config -> bui
ld/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssdlite_mobiledet_edgetpu_320x320_coco_sync_4x4.config ->
build/lib/object_detection/samples/configs
copying object_detection/samples/configs/ssdlite_mobiledet_gpu_320x320_coco_sync_4x4.config -> bui
ld/lib/object_detection/samples/configs
```



```
-- copying object_detection/protos/center_net.proto -> build/lib/object_detection/protos
copying object_detection/protos/eval.proto -> build/lib/object_detection/protos
copying object_detection/protos/faster_rcnn.proto -> build/lib/object_detection/protos
copying object_detection/protos/faster_rcnn_box_coder.proto -> build/lib/object_detection/protos
copying object_detection/protos/flexible_grid_anchor_generator.proto ->
build/lib/object_detection/protos
copying object_detection/protos/fpn.proto -> build/lib/object_detection/protos
copying object_detection/protos/graph_rewriter.proto -> build/lib/object_detection/protos
copying object_detection/protos/grid_anchor_generator.proto -> build/lib/object_detection/protos
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copying object_detection/protos/losses.proto -> build/lib/object_detection/protos
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build/lib/object_detection/protos
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build/lib/object_detection/protos
copying object_detection/protos/square_box_coder.proto -> build/lib/object_detection/protos
copying object_detection/protos/ssd.proto -> build/lib/object_detection/protos
copying object_detection/protos/ssd_anchor_generator.proto -> build/lib/object_detection/protos
copying object_detection/protos/string_int_label_map.proto -> build/lib/object_detection/protos
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copying object_detection/protos/train.proto -> build/lib/object_detection/protos
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build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/download_and_preprocess_ava.sh ->
build/lib/object_detection/dataset_tools
copying object_detection/dataset_tools/download_and_preprocess_mscoco.sh ->
build/lib/object_detection/dataset_tools
creating build/lib/object_detection/dataset_tools/densepose
copying object_detection/dataset_tools/densepose/UV_symmetry_transforms.mat ->
build/lib/object_detection/dataset_tools/densepose
creating build/lib/object_detection/models/keras_models/base_models
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build/lib/object_detection/models/keras_models/base_models
creating build/lib/object_detection/tpu_exporters/testdata/faster_rcnn
copying
object_detection/tpu_exporters/testdata/faster_rcnn/faster_rcnn_resnet101_atrous_coco.config -> bu
ild/lib/object_detection/tpu_exporters/testdata/faster_rcnn
creating build/lib/object_detection/tpu_exporters/testdata/ssd
copying object_detection/tpu_exporters/testdata/ssd/ssd_pipeline.config ->
build/lib/object_detection/tpu_exporters/testdata/ssd
running install
running bdist_egg
running egg_info
writing object_detection.egg-info/PKG-INFO
writing dependency_links to object_detection.egg-info/dependency_links.txt
writing requirements to object_detection.egg-info/requirements.txt
writing top-level names to object_detection.egg-info/top_level.txt
writing manifest file 'object_detection.egg-info/SOURCES.txt'
installing library code to build/bdist.linux-x86_64/egg
running install_lib
running build_py
creating build/bdist.linux-x86_64
creating build/bdist.linux-x86_64/egg
creating build/bdist.linux-x86_64/egg/object_detection
copying build/lib/object_detection/README.md -> build/bdist.linux-x86_64/egg/object_detection
creating build/bdist.linux-x86_64/egg/object_detection/data
copying build/lib/object_detection/data/pascal_label_map.pbtxt -> build/bdist.linux-
x86_64/egg/object_detection/data
copying build/lib/object_detection/data/pet_label_map.pbtxt -> build/bdist.linux-
x86_64/egg/object_detection/data
copying build/lib/object_detection/data/kitti_label_map.pbtxt -> build/bdist.linux-
x86_64/egg/object_detection/data
copying build/lib/object_detection/data/face_person_with_keypoints_label_map.pbtxt ->
build/bdist.linux-x86_64/egg/object_detection/data
copying build/lib/object_detection/data/snapshot_serengeti_label_map.pbtxt -> build/bdist.linux-x8
6_64/egg/object_detection/data
copying build/lib/object detection/data/mscoco_label_map.pbtxt -> build/bdist.linux-
```

```
x86_64/egg/object_detection/data
copying build/lib/object_detection/data/mscoco_minival_ids.txt -> build/bdist.linux-
x86_64/egg/object_detection/data
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_x86_64/egg/object_detection/data
copying build/lib/object_detection/data/oid_object_detection_challenge_500_label_map.pbtxt ->
build/bdist.linux-x86_64/egg/object_detection/data
copying build/lib/object_detection/data/face_label_map.pbtxt -> build/bdist.linux-
x86_64/egg/object_detection/data
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x86_64/egg/object_detection/data
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x86_64/egg/object_detection/data
copying build/lib/object_detection/data/oid_bbox_trainable_label_map.pbtxt -> build/bdist.linux-x8
6_64/egg/object_detection/data
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x86_64/egg/object_detection/data
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x86_64/egg/object_detection
creating build/bdist.linux-x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_mask_list_ops_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/object_detection_evaluation_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_ops.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/context_manager_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/target_assigner_utils.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/variables_helper_tf1_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/category_util_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/config_util.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/metrics.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/ops.py -> build/bdist.linux-
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x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_ops_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
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_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/test_utils.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/static_shape.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/per_image_vrd_evaluation.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/test_case_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_list_ops_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/test_utils_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/label_map_util.py -> build/bdist.linux-
```

```
x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_list_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/object_detection_evaluation.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/learning_schedules_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/spatial_transform_ops_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/dataset_util_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/target_assigner_utils_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/vrd_evaluation_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/visualization_utils_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/json_utils.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/spatial_transform_ops.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_mask_list_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_mask_list.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_list_ops.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/autoaugment_utils.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_mask_ops.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/shape_utils_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_mask_ops_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/json_utils_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_list.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
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x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/patch_ops_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/ops_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/visualization_utils.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/category_util.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/vrd_evaluation.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/model_util.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/patch_ops.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/static_shape_test.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
copying build/lib/object_detection/utils/np_box_mask_list_ops.py -> build/bdist.linux-
x86_64/egg/object_detection/utils
creating build/bdist.linux-x86_64/egg/object_detection/inference
copying build/lib/object_detection/inference/detection_inference_tf1_test.py -> build/bdist.linux-
x86_64/egg/object_detection/inference
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x86_64/egg/object_detection/inference
copying build/lib/object_detection/inference/detection_inference.py -> build/bdist.linux-
x86_64/egg/object_detection/inference
copying build/lib/object_detection/inference/infer_detections.py -> build/bdist.linux-
```



```
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copying build/lib/object_detection/CONTRIBUTING.md -> build/bdist.linux-x86_64/egg/object_detection
copying build/lib/object_detection/_init_.py -> build/bdist.linux-x86_64/egg/object_detection
creating build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/image_resizer.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/eval_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/post_processing.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/flexible_grid_anchor_generator_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/fpn_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/faster_rcnn_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/center_net_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/multiscale_anchor_generator.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/target_assigner.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/box_coder.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/_init__.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/calibration_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/ssd.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/matcher_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/model_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/keypoint_box_coder.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/ssd_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/faster_rcnn_box_coder.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/graph_rewriter.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/ssd_anchor_generator_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/argmax_matcher.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/string_int_label_map_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/post_processing_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/target_assigner_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/faster_rcnn.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/model.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/optimizer_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/faster_rcnn_box_coder_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/eval.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/hyperparams.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/anchor_generator_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/fpn.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/box_predictor.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/square_box_coder_pb2.py -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/optimizer.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/ssd_anchor_generator.proto -> build/bdist.linux-x86_64/egg/object_detection/protos
```

```
x86_64/egg/object_detection/protos
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x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/mean_stddev_box_coder_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/grid_anchor_generator_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/input_reader_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/pipeline_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/flexible_grid_anchor_generator.proto ->
build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/box_predictor_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
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x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/matcher.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/grid_anchor_generator.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/center_net.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/hyperparams_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/box_coder_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/multiscale_anchor_generator_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/losses_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
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x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/keypoint_box_coder_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/input_reader.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/pipeline.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
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x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/region_similarity_calculator.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/train.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/square_box_coder.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/bipartite_matcher_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
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x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/bipartite_matcher.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/image_resizer_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/region_similarity_calculator_pb2.py ->
build/bdist.linux-x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/string_int_label_map.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/calibration.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/mean_stddev_box_coder.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/graph_rewriter_pb2.py -> build/bdist.linux-
x86_64/egg/object_detection/protos
copying build/lib/object_detection/protos/preprocessor.proto -> build/bdist.linux-
x86_64/egg/object_detection/protos
creating build/bdist.linux-x86_64/egg/object_detection/data_decoders
copying build/lib/object_detection/data_decoders/_init_.py -> build/bdist.linux-
x86_64/egg/object_detection/data_decoders
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x86_64/egg/object_detection/data_decoders
copying build/lib/object_detection/data_decoders/tf_sequence_example_decoder.py ->
build/bdist.linux-x86_64/egg/object_detection/data_decoders
copying build/lib/object_detection/data_decoders/tf_sequence_example_decoder_test.py ->
build/bdist.linux-x86_64/egg/object_detection/data_decoders
copying build/lib/object_detection/data_decoders/tf_example_decoder_test.py -> build/bdist.linux-x
...
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copying build/lib/object_detection/legacy/trainer.py -> build/bdist.linux-x86_64/egg/object_detection/legacy
copying build/lib/object_detection/legacy/train.py -> build/bdist.linux-x86_64/egg/object_detection/legacy
copying build/lib/object_detection/legacy/trainer_tf1_test.py -> build/bdist.linux-x86_64/egg/object_detection/legacy
copying build/lib/object_detection/exporter_lib_v2.py -> build/bdist.linux-x86_64/egg/object_detection
creating build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/tf2_classification_zoo.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/exporting_models.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/tf1_detection_zoo.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
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copying build/lib/object_detection/g3doc/tf1_training_and_evaluation.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
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copying build/lib/object_detection/g3doc/using_your_own_dataset.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/tf1.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/evaluation_protocols.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
creating build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/tensorboard.png -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
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copying build/lib/object_detection/g3doc/img/oxford_pet.png -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/dogs_detections_output.jpg -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/example_cat.jpg -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/kites_detections_output.jpg -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/groupof_case_eval.png -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/nongroupof_case_eval.png -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/tensorboard2.png -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/oid_monkey_3b4168c89cecbc5b.jpg -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/tf-od-api-logo.png -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/img/kites_with_segment_overlay.png -> build/bdist.linux-x86_64/egg/object_detection/g3doc/img
copying build/lib/object_detection/g3doc/instance_segmentation.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/tf2_classification_zoo.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/running_on_mobile_tf2.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/release_notes.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/tpu_exporters.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/oid_inference_and_evaluation.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/configuring_jobs.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/running_notebook.md -> build/bdist.linux-x86_64/egg/object_detection/g3doc
```

```
x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/faq.md -> build/bdist.linux-
x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/tf2_training_and_evaluation.md -> build/bdist.linux-
x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/g3doc/tf2.md -> build/bdist.linux-
x86_64/egg/object_detection/g3doc
copying build/lib/object_detection/export_tflite_graph_lib_tf2_test.py -> build/bdist.linux-
x86_64/egg/object_detection
creating build/bdist.linux-x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/calibration_evaluation.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/oid_challenge_evaluation_utils.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/calibration_evaluation_tf1_test.py ->
build/bdist.linux-x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/__init__.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/oid_vrd_challenge_evaluation_utils.py ->
build/bdist.linux-x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/oid_vrd_challenge_evaluation.py -> build/bdist.linux-x8
6_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/io_utils.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/calibration_metrics_tf1_test.py -> build/bdist.linux-x8
6_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/coco_tools.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/offline_eval_map_corloc.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/calibration_metrics.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/oid_challenge_evaluation.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/coco_evaluation.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/lvis_tools_test.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/offline_eval_map_corloc_test.py -> build/bdist.linux-x8
6_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/lvis_evaluation_test.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/lvis_evaluation.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/oid_challenge_evaluation_utils_test.py ->
build/bdist.linux-x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/coco_evaluation_test.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/lvis_tools.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/coco_tools_test.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/tf_example_parser_test.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/tf_example_parser.py -> build/bdist.linux-
x86_64/egg/object_detection/metrics
copying build/lib/object_detection/metrics/oid_vrd_challenge_evaluation_utils_test.py ->
build/bdist.linux-x86_64/egg/object_detection/metrics
creating build/bdist.linux-x86_64/egg/object_detection/packages
creating build/bdist.linux-x86_64/egg/object_detection/packages/tf2
copying build/lib/object_detection/packages/tf2/setup.py -> build/bdist.linux-
x86_64/egg/object_detection/packages/tf2
creating build/bdist.linux-x86_64/egg/object_detection/packages/tf1
copying build/lib/object_detection/packages/tf1/setup.py -> build/bdist.linux-
x86_64/egg/object_detection/packages/tf1
copying build/lib/object_detection/model_tpu_main.py -> build/bdist.linux-
x86_64/egg/object_detection
copying build/lib/object_detection/model_lib_tf1_test.py -> build/bdist.linux-
x86_64/egg/object_detection
copying build/lib/object_detection/export_tflite_graph_lib_tf2.py -> build/bdist.linux-
x86_64/egg/object_detection
copying build/lib/object_detection/model_lib.py -> build/bdist.linux-x86_64/egg/object_detection
creating build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/seq_example_util_test.py -> build/bdist.linux-x86
_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/oid_tfrecord_creation_test.py ->
build/bdist.linux-x86_64/egg/object_detection/dataset_tools
```

```
copying build/lib/object_detection/dataset_tools/create_pascal_tf_record.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/__init__.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/create_oid_tf_record.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/oid_tfrecord_creation.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/oid_hierarchical_labels_expansion_test.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/seq_example_util.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
creating build/bdist.linux-x86_64/egg/object_detection/dataset_tools/densepose
copying build/lib/object_detection/dataset_tools/densepose/UV_symmetry_transforms.mat -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/densepose
copying build/lib/object_detection/dataset_tools/download_and_preprocess_mscoco.sh -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/tf_record_creation_util.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/create_ava_actions_tf_record.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/download_and_preprocess_ava.sh -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/tf_record_creation_util_test.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/create_pascal_tf_record_test.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/create_pycocotools_package.sh -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/create_coco_tf_record.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/create_coco_tf_record_test.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/create_pet_tf_record.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/oid_hierarchical_labels_expansion.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/dataset_tools/create_kitti_tf_record_test.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
creating build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying build/lib/object_detection/dataset_tools/context_rcnn/generate_embedding_data_tf2_test.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying build/lib/object_detection/dataset_tools/context_rcnn/__init__.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying build/lib/object_detection/dataset_tools/context_rcnn/add_context_to_examples.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying
build/lib/object_detection/dataset_tools/context_rcnn/create_cococameratraps_tfexample_tf2_test.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying build/lib/object_detection/dataset_tools/context_rcnn/generate_detection_data_tf2_test.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying
build/lib/object_detection/dataset_tools/context_rcnn/create_cococameratraps_tfexample_main.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying build/lib/object_detection/dataset_tools/context_rcnn/add_context_to_examples_tf2_test.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying build/lib/object_detection/dataset_tools/context_rcnn/generate_detection_data.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying build/lib/object_detection/dataset_tools/context_rcnn/generate_embedding_data.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools/context_rcnn
copying build/lib/object_detection/dataset_tools/create_kitti_tf_record.py -> build/bdist.linux-x86_64/egg/object_detection/dataset_tools
copying build/lib/object_detection/exporter.py -> build/bdist.linux-x86_64/egg/object_detection
copying build/lib/object_detection/export_inference_graph.py -> build/bdist.linux-x86_64/egg/object_detection
creating build/bdist.linux-x86_64/egg/object_detection/box_coders
copying build/lib/object_detection/box_coders/keypoint_box_coder_test.py -> build/bdist.linux-x86_64/egg/object_detection/box_coders
copying build/lib/object_detection/box_coders/__init__.py -> build/bdist.linux-x86_64/egg/object_detection/box_coders
copying build/lib/object_detection/box_coders/keypoint_box_coder.py -> build/bdist.linux-x86_64/egg/object_detection/box_coders
copying build/lib/object_detection/box_coders/square_box_coder.py -> build/bdist.linux-x86_64/egg/object_detection/box_coders
copying build/lib/object_detection/box_coders/faster_rcnn_box_coder_test.py -> build/bdist.linux-x86_64/egg/object_detection/box_coders
copying build/lib/object_detection/box_coders/mean_stddev_box_coder_test.py -> build/bdist.linux-x86_64/egg/object_detection/box_coders
```



```
copying build/lib/object_detection/configs/tf2/ssd_efficientdet_d2_768x768_coco17_tpu-8.config ->
build/bdist.linux-x86_64/egg/object_detection/configs/tf2
creating build/bdist.linux-x86_64/egg/object_detection/core
copying build/lib/object_detection/core/batch_multiclass_nms_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/preprocessor_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/data_parser.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/freezable_batch_norm_tf2_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/prefetcher_tf1_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/anchor_generator.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/standard_fields.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/class_agnostic_nms_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/__init__.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/keypoint_ops.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/box_coder.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/minibatch_sampler_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/data_decoder.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/box_list_ops.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/box_list_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/box_predictor.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/box_list.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/matcher.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/freezable_batch_norm.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/preprocessor_cache.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/batcher.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/balanced_positive_negative_sampler_test.py ->
build/bdist.linux-x86_64/egg/object_detection/core
copying build/lib/object_detection/core/densepose_ops.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/target_assigner_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/model.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/matcher_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/model_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/region_similarity_calculator_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/balanced_positive_negative_sampler.py ->
build/bdist.linux-x86_64/egg/object_detection/core
copying build/lib/object_detection/core/box_coder_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/multiclass_nms_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/keypoint_ops_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/prefetcher.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/densepose_ops_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/batcher_tf1_test.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/post_processing.py -> build/bdist.linux-
x86_64/egg/object_detection/core
copying build/lib/object_detection/core/losses.py -> build/bdist.linux-
x86_64/egg/object_detection/core
```



```
x86_64/egg/object_detection/predictors/heads
copying build/lib/object_detection/predictors/heads/keras_class_head.py -> build/bdist.linux-
x86_64/egg/object_detection/predictors/heads
copying build/lib/object_detection/predictors/heads/box_head.py -> build/bdist.linux-
x86_64/egg/object_detection/predictors/heads
copying build/lib/object_detection/predictors/heads/class_head.py -> build/bdist.linux-
x86_64/egg/object_detection/predictors/heads
copying build/lib/object_detection/predictors/heads/keypoint_head_tf1_test.py ->
build/bdist.linux-x86_64/egg/object_detection/predictors/heads
copying build/lib/object_detection/predictors/heads/mask_head_tf1_test.py -> build/bdist.linux-x86
_64/egg/object_detection/predictors/heads
copying build/lib/object_detection/predictors/heads/keras_class_head_tf2_test.py ->
build/bdist.linux-x86_64/egg/object_detection/predictors/heads
copying build/lib/object_detection/predictors/heads/keras_mask_head_tf2_test.py ->
build/bdist.linux-x86_64/egg/object_detection/predictors/heads
copying build/lib/object_detection/model_lib_v2.py -> build/bdist.linux-
x86_64/egg/object_detection
copying build/lib/object_detection/model_lib_tf2_test.py -> build/bdist.linux-
x86_64/egg/object_detection
copying build/lib/object_detection/inputs_test.py -> build/bdist.linux-x86_64/egg/object_detection
copying build/lib/object_detection/export_tflite_ssd_graph_lib.py -> build/bdist.linux-
x86_64/egg/object_detection
creating build/bdist.linux-x86_64/egg/object_detection/samples
creating build/bdist.linux-x86_64/egg/object_detection/samples/cloud
copying build/lib/object_detection/samples/cloud/cloud.yml -> build/bdist.linux-
x86_64/egg/object_detection/samples/cloud
creating build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying
build/lib/object_detection/samples/configs/ssdlite_mobiledet_gpu_320x320_coco_sync_4x4.config -> b
uild/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/faster_rcnn_resnet101_kitti.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/faster_rcnn_resnet50_coco.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying
build/lib/object_detection/samples/configs/ssd_mobilenet_v1_ppn_shared_box_predictor_300x300_coco14
c.config -> build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/faster_rcnn_resnet101_coco.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/faster_rcnn_resnet101_fgvc.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/mask_rcnn_resnet101_pets.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/ssdlite_mobilenet_v3_large_320x320_coco.config
-> build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying
build/lib/object_detection/samples/configs/faster_rcnn_inception_resnet_v2_atrous_pets.config -> b
uild/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/faster_rcnn_resnet50_pets.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/ssd_inception_v2_pets.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/ssd_mobilenet_v1_pets.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying
build/lib/object_detection/samples/configs/ssd_resnet50_v1_fpn_shared_box_predictor_640x640_coco14_
.config -> build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/faster_rcnn_resnet101_pets.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/rfcn_resnet101_pets.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/faster_rcnn_resnet101_atrous_coco.config -> bui
ld/bdist.linux-x86_64/egg/object_detection/samples/configs
copying
build/lib/object_detection/samples/configs/ssd_mobilenet_v2_mnasfpn_shared_box_predictor_320x320_cc
ync.config -> build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying
build/lib/object_detection/samples/configs/faster_rcnn_inception_resnet_v2_atrous_oid.config -> bu
ild/bdist.linux-x86_64/egg/object_detection/samples/configs
copying
build/lib/object_detection/samples/configs/mask_rcnn_inception_resnet_v2_atrous_coco.config -> bui
ld/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/ssd_mobilenet_v2_fullyconv_coco.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying build/lib/object_detection/samples/configs/faster_rcnn_resnet152_pets.config ->
build/bdist.linux-x86_64/egg/object_detection/samples/configs
copying
```

```
build/lib/object_detection/samples/configs/ssdlite_mobiledet_dsp_320x320_coco_sync_4x4.config -> b  
uild/bdist.linux-x86_64/egg/object_detection/samples/configs  
copying build/lib/object_detection/samples/configs/faster_rcnn_resnet50_fgvc.config ->  
build/bdist.linux-x86_64/egg/object_detection/samples/configs  
copying  
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6.pyc
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reprocessor_builder.cpython-36.pyc
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ataset_builder_test.cpython-36.pyc
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ssd_mobilenet_v2_tpn_feature_extractor_tf1_test.cpython-36.pyc
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to faster_rcnn_inception_resnet_v2_keras_feature_extractor_tf2_test.cpython-36.pyc
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ssa_mobilenet_v2_keras_feature_extractor.cpython-36.pyc
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eature_map_generators.cpython-36.pyc
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byte-compiling build/bdist.linux-
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36.pyc
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byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/data_parser.py to
data_parser.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/freezable_batch_norm_tf2_test.py
to freezable_batch_norm_tf2_test.cpython-36.pyc
```

```
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/prefetcher_tf1_test.py to
prefetcher_tf1_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/anchor_generator.py to
anchor_generator.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/standard_fields.py to
standard_fields.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/class_agnostic_nms_test.py to cl
ass_agnostic_nms_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/__init__.py to __init__.cpython-
36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/keypoint_ops.py to
keypoint_ops.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/box_coder.py to
box_coder.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/minibatch_sampler_test.py to min
ibatch_sampler_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/data_decoder.py to
data_decoder.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/box_list_ops.py to
box_list_ops.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/box_list_test.py to
box_list_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/box_predictor.py to
box_predictor.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/box_list.py to box_list.cpython-
36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/matcher.py to matcher.cpython-36
.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/freezable_batch_norm.py to
freezable_batch_norm.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/preprocessor_cache.py to
preprocessor_cache.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/batcher.py to batcher.cpython-36
.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/core/balanced_positive_negative_sampler_test.py to
balanced_positive_negative_sampler_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/densepose_ops.py to
densepose_ops.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/target_assigner_test.py to
target_assigner_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/model.py to model.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/matcher_test.py to
matcher_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/model_test.py to
model_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/core/region_similarity_calculator_test.py to
region_similarity_calculator_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/core/balanced_positive_negative_sampler.py to
balanced_positive_negative_sampler.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/box_coder_test.py to
box_coder_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/multiclass_nms_test.py to
multiclass_nms_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/keypoint_ops_test.py to
keypoint_ops_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/prefetcher.py to
prefetcher.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/densepose_ops_test.py to
densepose_ops_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/batcher_tf1_test.py to
batcher_tf1_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/post_processing.py to
post_processing.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/losses.py to losses.cpython-
36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/preprocessor.py to
preprocessor.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/minibatch_sampler.py to
minibatch_sampler.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/box_list_ops_test.py to
box_list_ops_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/losses_test.py to
losses_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/region_similarity_calculator.py
```

```
to region_similarity_calculator.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/core/target_assigner.py to
target_assigner.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/model_main.py to model_main.cpython-3
6.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/anchor_generators/multiple_grid_anchor_generator.py to
multiple_grid_anchor_generator.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/anchor_generators/grid_anchor_generator.py to
grid_anchor_generator.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/anchor_generators/__init__.py to
__init__.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/anchor_generators/multiscale_grid_anchor_generator_test.py to
multiscale_grid_anchor_generator_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/anchor_generators/multiscale_grid_anchor_generator.py to
multiscale_grid_anchor_generator.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/anchor_generators/multiple_grid_anchor_generator_test.py to
multiple_grid_anchor_generator_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/anchor_generators/flexible_grid_anchor_generator.py to
flexible_grid_anchor_generator.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/anchor_generators/flexible_grid_anchor_generator_test.py to
flexible_grid_anchor_generator_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/anchor_generators/grid_anchor_generator_test.py to
grid_anchor_generator_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/mask_rcnn_keras_box_predictor_tf2_test.py to
mask_rcnn_keras_box_predictor_tf2_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/__init__.py to
__init__.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/rfcn_box_predictor.py to r
fcn_box_predictor.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/convolutional_keras_box_predictor.py to
convolutional_keras_box_predictor.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/convolutional_keras_box_predictor_tf2_test.py to
convolutional_keras_box_predictor_tf2_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/mask_rcnn_box_predictor_tf1_test.py to
mask_rcnn_box_predictor_tf1_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/mask_rcnn_keras_box_predictor.py to
mask_rcnn_keras_box_predictor.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/rfcn_box_predictor_tf1_test.py to
rfcn_box_predictor_tf1_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/rfcn_keras_box_predictor_tf2_test.py to
rfcn_keras_box_predictor_tf2_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/convolutional_box_predictor.py to
convolutional_box_predictor.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/mask_rcnn_box_predictor.py to
mask_rcnn_box_predictor.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/rfcn_keras_box_predictor.py to
rfcn_keras_box_predictor.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/convolutional_box_predictor_tf1_test.py to
convolutional_box_predictor_tf1_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/heads/keras_box_head_tf2_test.py to
keras_box_head_tf2_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/box_head_tf1_test.py to
box_head_tf1_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/__init__.py to
__init__.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/mask_head.py to
mask_head.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/keras_box_head.py to
```

```
keras_box_head.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/head.py to head.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/keypoint_head.py to keypoint_head.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/heads/class_head_tf1_test.py to class_head_tf1_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/keras_mask_head.py to keras_mask_head.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/keras_class_head.py to keras_class_head.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/box_head.py to box_head.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/predictors/heads/class_head.py to class_head.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/heads/keypoint_head_tf1_test.py to keypoint_head_tf1_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/heads/mask_head_tf1_test.py to mask_head_tf1_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/heads/keras_class_head_tf2_test.py to keras_class_head_tf2_test.cpython-36.pyc
byte-compiling build/bdist.linux-
x86_64/egg/object_detection/predictors/heads/keras_mask_head_tf2_test.py to keras_mask_head_tf2_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/model_lib_v2.py to model_lib_v2.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/model_lib_tf2_test.py to model_lib_tf2_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/inputs_test.py to inputs_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/export_tflite_ssd_graph_lib.py to export_tflite_ssd_graph_lib.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/eval_util.py to eval_util.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/exporter_lib_tf2_test.py to exporter_lib_tf2_test.cpython-36.pyc
byte-compiling build/bdist.linux-x86_64/egg/object_detection/model_main_tf2.py to model_main_tf2.cpython-36.pyc
creating build/bdist.linux-x86_64/egg/EGG-INFO
copying object_detection.egg-info/PKG-INFO -> build/bdist.linux-x86_64/egg/EGG-INFO
copying object_detection.egg-info/SOURCES.txt -> build/bdist.linux-x86_64/egg/EGG-INFO
copying object_detection.egg-info/dependency_links.txt -> build/bdist.linux-x86_64/egg/EGG-INFO
copying object_detection.egg-info/requirements.txt -> build/bdist.linux-x86_64/egg/EGG-INFO
copying object_detection.egg-info/top_level.txt -> build/bdist.linux-x86_64/egg/EGG-INFO
zip_safe flag not set; analyzing archive contents...
object_detection.core._pycache_.densepose_ops.cpython-36: module references __file__
object_detection.core._pycache_.preprocessor.cpython-36: module MAY be using inspect.stack
object_detection.utils._pycache_.autoaugment_utils.cpython-36: module MAY be using inspect.stack
creating dist
creating 'dist/object_detection-0.1-py3.6.egg' and adding 'build/bdist.linux-x86_64/egg' to it
removing 'build/bdist.linux-x86_64/egg' (and everything under it)
Processing object_detection-0.1-py3.6.egg
creating /usr/local/lib/python3.6/dist-packages/object_detection-0.1-py3.6.egg
Extracting object_detection-0.1-py3.6.egg to /usr/local/lib/python3.6/dist-packages
Adding object-detection 0.1 to easy-install.pth file

Installed /usr/local/lib/python3.6/dist-packages/object_detection-0.1-py3.6.egg
Processing dependencies for object-detection==0.1
Searching for Cython==0.29.21
Best match: Cython 0.29.21
Adding Cython 0.29.21 to easy-install.pth file
Installing cygdb script to /usr/local/bin
Installing cython script to /usr/local/bin
Installing cythonize script to /usr/local/bin

Using /usr/local/lib/python3.6/dist-packages
Searching for matplotlib==3.2.2
Best match: matplotlib 3.2.2
Adding matplotlib 3.2.2 to easy-install.pth file

Using /usr/local/lib/python3.6/dist-packages
Searching for Pillow==7.0.0
Best match: Pillow 7.0.0
```

```
Adding Pillow 7.0.0 to easy-install.pth file

Using /usr/local/lib/python3.6/dist-packages
Searching for kiwisolver==1.3.1
Best match: kiwisolver 1.3.1
Adding kiwisolver 1.3.1 to easy-install.pth file

Using /usr/local/lib/python3.6/dist-packages
Searching for python-dateutil==2.8.1
Best match: python-dateutil 2.8.1
Adding python-dateutil 2.8.1 to easy-install.pth file

Using /usr/local/lib/python3.6/dist-packages
Searching for cycler==0.10.0
Best match: cycler 0.10.0
Adding cycler 0.10.0 to easy-install.pth file

Using /usr/local/lib/python3.6/dist-packages
Searching for numpy==1.18.5
Best match: numpy 1.18.5
Adding numpy 1.18.5 to easy-install.pth file
Installing f2py script to /usr/local/bin
Installing f2py3 script to /usr/local/bin
Installing f2py3.6 script to /usr/local/bin

Using /usr/local/lib/python3.6/dist-packages
Searching for pyparsing==2.4.7
Best match: pyparsing 2.4.7
Adding pyparsing 2.4.7 to easy-install.pth file

Using /usr/local/lib/python3.6/dist-packages
Searching for six==1.15.0
Best match: six 1.15.0
Adding six 1.15.0 to easy-install.pth file

Using /usr/local/lib/python3.6/dist-packages
Finished processing dependencies for object-detection==0.1
```

In []:

```
#/content/models/research/slim/nets
#shutil.copy( '/content/models/research/slim/nets', "/content/models/research/object_detection/")
!cp -r '/content/models/research/slim/nets' "/content/models/research/object_detection/"
```

In []:

```
#will test if we are ready with desired lib by compiling builder.py file
%cd '/content/models/research/object_detection/builders'
!python /content/models/research/object_detection/builders/model_builder_tf2_test.py

/content/models/research/object_detection/builders
2020-12-11 16:47:55.143342: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudart.so.10.1
Running tests under Python 3.6.9: /usr/bin/python3
[ RUN      ] ModelBuilderTF2Test.test_create_center_net_model
2020-12-11 16:47:58.489400: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcuda.so.1
2020-12-11 16:47:58.551115: E tensorflow/stream_executor/cuda/cuda_driver.cc:314] failed call to cuInit: CUDA_ERROR_NO_DEVICE: no CUDA-capable device is detected
2020-12-11 16:47:58.551171: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:156] kernel driver does not appear to be running on this host (db894017e717): /proc/driver/nvidia/version does not exist
2020-12-11 16:47:58.657363: I tensorflow/core/platform/profile_utils/cpu_utils.cc:104] CPU Frequency: 2300000000 Hz
2020-12-11 16:47:58.657716: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x3038f40 initialized for platform Host (this does not guarantee that XLA will be used). Devices: 2020-12-11 16:47:58.657764: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): Host, Default Version
2020-12-11 16:48:03.629271: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 18874368 exceeds 10% of free system memory.
2020-12-11 16:48:03.661760: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 18874368 exceeds 10% of free system memory.
2020-12-11 16:48:03.670471: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 18874368 exceeds 10% of free system memory.
```

```
874368 exceeds 10% of free system memory.
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_center_net_model): 5.81s
I1211 16:48:03.978753 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_center_net_model): 5.81s
[ OK ] ModelBuilderTF2Test.test_create_center_net_model
[ RUN ] ModelBuilderTF2Test.test_create_experimental_model
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_experimental_model): 0.0s
I1211 16:48:03.980371 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_experimental_model): 0.0s
[ OK ] ModelBuilderTF2Test.test_create_experimental_model
[ RUN ] ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_feature0 (True)
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_feature0 (True)): 0.04s
I1211 16:48:04.020890 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_feature0 (True)):
0.04s
[ OK ] ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_feature0 (True)
[ RUN ] ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_feature1 (False)
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_feature1 (False)): 0.02s
I1211 16:48:04.044883 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_feature1 (False)):
0.02s
[ OK ] ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_feature1 (False)
[ RUN ] ModelBuilderTF2Test.test_create_faster_rcnn_model_from_config_with_example_miner
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_model_from_config_with_ex
e_miner): 0.02s
I1211 16:48:04.069491 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_model_from_config_with_example_miner): 0
.02s
[ OK ] ModelBuilderTF2Test.test_create_faster_rcnn_model_from_config_with_example_miner
[ RUN ]
ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rcnn_with_matmul
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster
n_with_matmul): 0.17s
I1211 16:48:04.240936 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rcnn_with_matmu
0.17s
[ OK ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rcnn_with_matmul
[ RUN ]
ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rcnn_without_matmul
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster
n_without_matmul): 0.16s
I1211 16:48:04.406458 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rcnn_without_ma
0.16s
[ OK ]
ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rcnn_without_matmul
[ RUN ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn_with_matmul
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_r
with_matmul): 0.16s
I1211 16:48:04.569628 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn_with_matmul)
0.16s
[ OK ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn_with_matmul
[ RUN ]
ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn_without_matmul
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_r
without_matmul): 0.16s
I1211 16:48:04.731829 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn_without_matm
0.16s
[ OK ]
ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn_without_matmul
[ RUN ] ModelBuilderTF2Test.test_create_rfcn_model_from_config
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_rfcn_model_from_config): 0.17s
I1211 16:48:04.901653 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_rfcn_model_from_config): 0.17s
[ OK ] ModelBuilderTF2Test.test_create_rfcn_model_from_config
[ RUN ] ModelBuilderTF2Test.test_create_ssd_fpn_model_from_config
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_ssd_fpn_model_from_config): 0.05s
I1211 16:48:04.950832 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_ssd_fpn_model_from_config): 0.05s
[ OK ] ModelBuilderTF2Test.test_create_ssd_fpn_model_from_config
[ RUN ] ModelBuilderTF2Test.test_create_ssd_models_from_config
I1211 16:48:05.288181 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:144]
EfficientDet EfficientNet backbone version: efficientnet-b0
```

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I1211 16:48:05.288384 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:145]
EfficientDet BiFPN num filters: 64
I1211 16:48:05.288485 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:147]
EfficientDet BiFPN num iterations: 3
I1211 16:48:05.295691 139802979170176 efficientnet_model.py:148] round_filter input=32 output=32
I1211 16:48:05.320667 139802979170176 efficientnet_model.py:148] round_filter input=32 output=32
I1211 16:48:05.320856 139802979170176 efficientnet_model.py:148] round_filter input=16 output=16
I1211 16:48:05.401272 139802979170176 efficientnet_model.py:148] round_filter input=16 output=16
I1211 16:48:05.401468 139802979170176 efficientnet_model.py:148] round_filter input=24 output=24
I1211 16:48:05.608399 139802979170176 efficientnet_model.py:148] round_filter input=24 output=24
I1211 16:48:05.608626 139802979170176 efficientnet_model.py:148] round_filter input=40 output=40
I1211 16:48:05.820415 139802979170176 efficientnet_model.py:148] round_filter input=40 output=40
I1211 16:48:05.820641 139802979170176 efficientnet_model.py:148] round_filter input=80 output=80
I1211 16:48:06.142527 139802979170176 efficientnet_model.py:148] round_filter input=80 output=80
I1211 16:48:06.142739 139802979170176 efficientnet_model.py:148] round_filter input=112 output=112
I1211 16:48:06.476213 139802979170176 efficientnet_model.py:148] round_filter input=112 output=112
I1211 16:48:06.476411 139802979170176 efficientnet_model.py:148] round_filter input=192 output=192
I1211 16:48:07.103867 139802979170176 efficientnet_model.py:148] round_filter input=192 output=192
I1211 16:48:07.104071 139802979170176 efficientnet_model.py:148] round_filter input=320 output=320
I1211 16:48:07.221612 139802979170176 efficientnet_model.py:148] round_filter input=1280
output=1280
I1211 16:48:07.297339 139802979170176 efficientnet_model.py:462] Building model efficientnet with
params ModelConfig(width_coefficient=1.0, depth_coefficient=1.0, resolution=224, dropout_rate=0.2,
blocks=(BlockConfig(input_filters=32, output_filters=16, kernel_size=3, num_repeat=1,
expand_ratio=1, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=16, output_filters=24, kernel_size=3,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=24, output_filters=40, kernel_size=5,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=40, output_filters=80, kernel_size=3,
num_repeat=3, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=80, output_filters=112, kernel_size=5,
num_repeat=3, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=112, output_filters=192, kernel_size=5,
num_repeat=4, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=192, output_filters=320, kernel_size=3,
num_repeat=1, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise')), stem_base_filters=32, top_base_filters=1280, activation='simple_swish', b
atch_norm='default', bn_momentum=0.99, bn_epsilon=0.001, weight_decay=5e-06,
drop_connect_rate=0.2, depth_divisor=8, min_depth=None, use_se=True, input_channels=3,
num_classes=1000, model_name='efficientnet', rescale_input=False, data_format='channels_last', dty
pe='float32')
I1211 16:48:07.399769 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:144]
EfficientDet EfficientNet backbone version: efficientnet-b1
I1211 16:48:07.399964 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:145]
EfficientDet BiFPN num filters: 88
I1211 16:48:07.400048 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:147]
EfficientDet BiFPN num iterations: 4
I1211 16:48:07.406552 139802979170176 efficientnet_model.py:148] round_filter input=32 output=32
I1211 16:48:07.431885 139802979170176 efficientnet_model.py:148] round_filter input=32 output=32
I1211 16:48:07.432068 139802979170176 efficientnet_model.py:148] round_filter input=16 output=16
I1211 16:48:07.591554 139802979170176 efficientnet_model.py:148] round_filter input=16 output=16
I1211 16:48:07.591780 139802979170176 efficientnet_model.py:148] round_filter input=24 output=24
I1211 16:48:07.915453 139802979170176 efficientnet_model.py:148] round_filter input=24 output=24
I1211 16:48:07.915668 139802979170176 efficientnet_model.py:148] round_filter input=40 output=40
I1211 16:48:08.233120 139802979170176 efficientnet_model.py:148] round_filter input=40 output=40
I1211 16:48:08.233322 139802979170176 efficientnet_model.py:148] round_filter input=80 output=80
I1211 16:48:08.674342 139802979170176 efficientnet_model.py:148] round_filter input=80 output=80
I1211 16:48:08.674549 139802979170176 efficientnet_model.py:148] round_filter input=112 output=112
I1211 16:48:09.121131 139802979170176 efficientnet_model.py:148] round_filter input=112 output=112
I1211 16:48:09.121334 139802979170176 efficientnet_model.py:148] round_filter input=192 output=192
I1211 16:48:09.752611 139802979170176 efficientnet_model.py:148] round_filter input=192 output=192
I1211 16:48:09.752807 139802979170176 efficientnet_model.py:148] round_filter input=320 output=320
I1211 16:48:10.020607 139802979170176 efficientnet_model.py:148] round_filter input=1280
output=1280
I1211 16:48:10.089772 139802979170176 efficientnet_model.py:462] Building model efficientnet with
params ModelConfig(width_coefficient=1.0, depth_coefficient=1.1, resolution=240, dropout_rate=0.2,
blocks=(BlockConfig(input_filters=32, output_filters=16, kernel_size=3, num_repeat=1,
expand_ratio=1, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=16, output_filters=24, kernel_size=3,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=24, output_filters=40, kernel_size=5,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=40, output_filters=80, kernel_size=3,
num_repeat=3, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=80, output_filters=112, kernel_size=5,
num_repeat=3, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
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conv_type='depthwise'), BlockConfig(input_filters=112, output_filters=192, kernel_size=5,
num_repeat=4, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=192, output_filters=320, kernel_size=3,
num_repeat=1, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise')), stem_base_filters=32, top_base_filters=1280, activation='simple_swish', batch_norm='default', bn_momentum=0.99, bn_epsilon=0.001, weight_decay=5e-06,
drop_connect_rate=0.2, depth_divisor=8, min_depth=None, use_se=True, input_channels=3,
num_classes=1000, model_name='efficientnet', rescale_input=False, data_format='channels_last', dtype='float32')
I1211 16:48:10.193225 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:144]
EfficientDet EfficientNet backbone version: efficientnet-b2
I1211 16:48:10.193422 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:145]
EfficientDet BiFPN num filters: 112
I1211 16:48:10.193513 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:147]
EfficientDet BiFPN num iterations: 5
I1211 16:48:10.199792 139802979170176 efficientnet_model.py:148] round_filter input=32 output=32
I1211 16:48:10.224121 139802979170176 efficientnet_model.py:148] round_filter input=32 output=32
I1211 16:48:10.224322 139802979170176 efficientnet_model.py:148] round_filter input=16 output=16
I1211 16:48:10.593173 139802979170176 efficientnet_model.py:148] round_filter input=16 output=16
I1211 16:48:10.593391 139802979170176 efficientnet_model.py:148] round_filter input=24 output=24
I1211 16:48:10.912922 139802979170176 efficientnet_model.py:148] round_filter input=24 output=24
I1211 16:48:10.913120 139802979170176 efficientnet_model.py:148] round_filter input=40 output=48
I1211 16:48:11.236335 139802979170176 efficientnet_model.py:148] round_filter input=40 output=48
I1211 16:48:11.236555 139802979170176 efficientnet_model.py:148] round_filter input=80 output=88
I1211 16:48:11.688515 139802979170176 efficientnet_model.py:148] round_filter input=80 output=88
I1211 16:48:11.688734 139802979170176 efficientnet_model.py:148] round_filter input=112 output=120
I1211 16:48:12.154628 139802979170176 efficientnet_model.py:148] round_filter input=112 output=120
I1211 16:48:12.154823 139802979170176 efficientnet_model.py:148] round_filter input=192 output=208
I1211 16:48:12.792164 139802979170176 efficientnet_model.py:148] round_filter input=192 output=208
I1211 16:48:12.792406 139802979170176 efficientnet_model.py:148] round_filter input=320 output=352
I1211 16:48:13.086621 139802979170176 efficientnet_model.py:148] round_filter input=1280
output=1408
I1211 16:48:13.166494 139802979170176 efficientnet_model.py:462] Building model efficientnet with
params ModelConfig(width_coefficient=1.1, depth_coefficient=1.2, resolution=260, dropout_rate=0.3,
blocks=(BlockConfig(input_filters=32, output_filters=16, kernel_size=3, num_repeat=1,
expand_ratio=1, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=16, output_filters=24, kernel_size=3,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=24, output_filters=40, kernel_size=5,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=40, output_filters=80, kernel_size=3,
num_repeat=3, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=80, output_filters=112, kernel_size=5,
num_repeat=3, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=112, output_filters=192, kernel_size=5,
num_repeat=4, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=192, output_filters=320, kernel_size=3,
num_repeat=1, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise')), stem_base_filters=32, top_base_filters=1280, activation='simple_swish', batch_norm='default', bn_momentum=0.99, bn_epsilon=0.001, weight_decay=5e-06,
drop_connect_rate=0.2, depth_divisor=8, min_depth=None, use_se=True, input_channels=3,
num_classes=1000, model_name='efficientnet', rescale_input=False, data_format='channels_last', dtype='float32')
I1211 16:48:13.271879 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:144]
EfficientDet EfficientNet backbone version: efficientnet-b3
I1211 16:48:13.272076 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:145]
EfficientDet BiFPN num filters: 160
I1211 16:48:13.272162 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:147]
EfficientDet BiFPN num iterations: 6
I1211 16:48:13.278411 139802979170176 efficientnet_model.py:148] round_filter input=32 output=40
I1211 16:48:13.302413 139802979170176 efficientnet_model.py:148] round_filter input=32 output=40
I1211 16:48:13.302583 139802979170176 efficientnet_model.py:148] round_filter input=16 output=24
I1211 16:48:13.470738 139802979170176 efficientnet_model.py:148] round_filter input=16 output=24
I1211 16:48:13.470942 139802979170176 efficientnet_model.py:148] round_filter input=24 output=32
I1211 16:48:13.791879 139802979170176 efficientnet_model.py:148] round_filter input=24 output=32
I1211 16:48:13.792081 139802979170176 efficientnet_model.py:148] round_filter input=40 output=48
I1211 16:48:14.113329 139802979170176 efficientnet_model.py:148] round_filter input=40 output=48
I1211 16:48:14.113543 139802979170176 efficientnet_model.py:148] round_filter input=80 output=96
I1211 16:48:14.671752 139802979170176 efficientnet_model.py:148] round_filter input=80 output=96
I1211 16:48:14.671960 139802979170176 efficientnet_model.py:148] round_filter input=112 output=136
I1211 16:48:15.507207 139802979170176 efficientnet_model.py:148] round_filter input=112 output=136
I1211 16:48:15.507417 139802979170176 efficientnet_model.py:148] round_filter input=192 output=232
I1211 16:48:16.315402 139802979170176 efficientnet_model.py:148] round_filter input=192 output=232
I1211 16:48:16.315627 139802979170176 efficientnet_model.py:148] round_filter input=320 output=384
I1211 16:48:16.627767 139802979170176 efficientnet_model.py:148] round_filter input=1280
output=1536
I1211 16:48:16.706034 139802979170176 efficientnet_model.py:462] Building model efficientnet with
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params ModelConfig(width_coefficient=1.2, depth_coefficient=1.4, resolution=300, dropout_rate=0.3,
blocks=(BlockConfig(input_filters=32, output_filters=16, kernel_size=3, num_repeat=1,
expand_ratio=1, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=16, output_filters=24, kernel_size=3,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=24, output_filters=40, kernel_size=5,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=40, output_filters=80, kernel_size=3,
num_repeat=3, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=80, output_filters=112, kernel_size=5,
num_repeat=3, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=112, output_filters=192, kernel_size=5,
num_repeat=4, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=192, output_filters=320, kernel_size=3,
num_repeat=1, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise')), stem_base_filters=32, top_base_filters=1280, activation='simple_swish', batch_norm='default', bn_momentum=0.99, bn_epsilon=0.001, weight_decay=5e-06,
drop_connect_rate=0.2, depth_divisor=8, min_depth=None, use_se=True, input_channels=3,
num_classes=1000, model_name='efficientnet', rescale_input=False, data_format='channels_last', dtype='float32')
I1211 16:48:16.818059 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:144]
EfficientDet EfficientNet backbone version: efficientnet-b4
I1211 16:48:16.818252 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:145]
EfficientDet BiFPN num filters: 224
I1211 16:48:16.818348 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:147]
EfficientDet BiFPN num iterations: 7
I1211 16:48:16.824505 139802979170176 efficientnet_model.py:148] round_filter input=32 output=48
I1211 16:48:16.848196 139802979170176 efficientnet_model.py:148] round_filter input=32 output=48
I1211 16:48:16.848401 139802979170176 efficientnet_model.py:148] round_filter input=16 output=24
I1211 16:48:17.005836 139802979170176 efficientnet_model.py:148] round_filter input=16 output=24
I1211 16:48:17.006036 139802979170176 efficientnet_model.py:148] round_filter input=24 output=32
I1211 16:48:17.445032 139802979170176 efficientnet_model.py:148] round_filter input=24 output=32
I1211 16:48:17.445226 139802979170176 efficientnet_model.py:148] round_filter input=40 output=56
I1211 16:48:17.879373 139802979170176 efficientnet_model.py:148] round_filter input=40 output=56
I1211 16:48:17.879582 139802979170176 efficientnet_model.py:148] round_filter input=80 output=112
I1211 16:48:18.567681 139802979170176 efficientnet_model.py:148] round_filter input=80 output=112
I1211 16:48:18.567876 139802979170176 efficientnet_model.py:148] round_filter input=112 output=160
I1211 16:48:19.303749 139802979170176 efficientnet_model.py:148] round_filter input=112 output=160
I1211 16:48:19.303983 139802979170176 efficientnet_model.py:148] round_filter input=192 output=272
I1211 16:48:20.419559 139802979170176 efficientnet_model.py:148] round_filter input=192 output=272
I1211 16:48:20.419779 139802979170176 efficientnet_model.py:148] round_filter input=320 output=448
I1211 16:48:20.763538 139802979170176 efficientnet_model.py:148] round_filter input=1280
output=1792
I1211 16:48:20.848028 139802979170176 efficientnet_model.py:462] Building model efficientnet with
params ModelConfig(width_coefficient=1.4, depth_coefficient=1.8, resolution=380, dropout_rate=0.4,
blocks=(BlockConfig(input_filters=32, output_filters=16, kernel_size=3, num_repeat=1,
expand_ratio=1, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=16, output_filters=24, kernel_size=3,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=24, output_filters=40, kernel_size=5,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=40, output_filters=80, kernel_size=3,
num_repeat=3, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=80, output_filters=112, kernel_size=5,
num_repeat=3, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=112, output_filters=192, kernel_size=5,
num_repeat=4, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=192, output_filters=320, kernel_size=3,
num_repeat=1, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise')), stem_base_filters=32, top_base_filters=1280, activation='simple_swish', batch_norm='default', bn_momentum=0.99, bn_epsilon=0.001, weight_decay=5e-06,
drop_connect_rate=0.2, depth_divisor=8, min_depth=None, use_se=True, input_channels=3,
num_classes=1000, model_name='efficientnet', rescale_input=False, data_format='channels_last', dtype='float32')
I1211 16:48:20.975119 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:144]
EfficientDet EfficientNet backbone version: efficientnet-b5
I1211 16:48:20.975320 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:145]
EfficientDet BiFPN num filters: 288
I1211 16:48:20.975417 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:147]
EfficientDet BiFPN num iterations: 7
I1211 16:48:20.981624 139802979170176 efficientnet_model.py:148] round_filter input=32 output=48
I1211 16:48:21.008427 139802979170176 efficientnet_model.py:148] round_filter input=32 output=48
I1211 16:48:21.008658 139802979170176 efficientnet_model.py:148] round_filter input=16 output=24
I1211 16:48:21.549780 139802979170176 efficientnet_model.py:148] round_filter input=16 output=24
I1211 16:48:21.549975 139802979170176 efficientnet_model.py:148] round_filter input=24 output=40
I1211 16:48:22.098961 139802979170176 efficientnet_model.py:148] round_filter input=24 output=40
I1211 16:48:22.099169 139802979170176 efficientnet_model.py:148] round_filter input=40 output=64

```

```
I1211 16:48:22.649672 139802979170176 efficientnet_model.py:148] round_filter input=40 output=64
I1211 16:48:22.649872 139802979170176 efficientnet_model.py:148] round_filter input=80 output=128
I1211 16:48:23.478058 139802979170176 efficientnet_model.py:148] round_filter input=80 output=128
I1211 16:48:23.478265 139802979170176 efficientnet_model.py:148] round_filter input=112 output=176
I1211 16:48:24.337019 139802979170176 efficientnet_model.py:148] round_filter input=112 output=176
I1211 16:48:24.337219 139802979170176 efficientnet_model.py:148] round_filter input=192 output=304
I1211 16:48:25.637461 139802979170176 efficientnet_model.py:148] round_filter input=192 output=304
I1211 16:48:25.637676 139802979170176 efficientnet_model.py:148] round_filter input=320 output=512
I1211 16:48:26.219438 139802979170176 efficientnet_model.py:148] round_filter input=1280
output=2048
I1211 16:48:26.319928 139802979170176 efficientnet_model.py:462] Building model efficientnet with
params ModelConfig(width_coefficient=1.6, depth_coefficient=2.2, resolution=456, dropout_rate=0.4,
blocks=(BlockConfig(input_filters=32, output_filters=16, kernel_size=3, num_repeat=1,
expand_ratio=1, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=16, output_filters=24, kernel_size=3,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=24, output_filters=40, kernel_size=5,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=40, output_filters=80, kernel_size=3,
num_repeat=3, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=80, output_filters=112, kernel_size=5,
num_repeat=3, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=112, output_filters=192, kernel_size=5,
num_repeat=4, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=192, output_filters=320, kernel_size=3,
num_repeat=1, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'))), stem_base_filters=32, top_base_filters=1280, activation='simple_swish',
batch_norm='default', bn_momentum=0.99, bn_epsilon=0.001, weight_decay=5e-06,
drop_connect_rate=0.2, depth_divisor=8, min_depth=None, use_se=True, input_channels=3,
num_classes=1000, model_name='efficientnet', rescale_input=False, data_format='channels_last', dty
pe='float32')
I1211 16:48:26.468546 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:144]
EfficientDet EfficientNet backbone version: efficientnet-b6
I1211 16:48:26.468759 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:145]
EfficientDet BiFPN num filters: 384
I1211 16:48:26.468847 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:147]
EfficientDet BiFPN num iterations: 8
I1211 16:48:26.475136 139802979170176 efficientnet_model.py:148] round_filter input=32 output=56
I1211 16:48:26.499025 139802979170176 efficientnet_model.py:148] round_filter input=32 output=56
I1211 16:48:26.499211 139802979170176 efficientnet_model.py:148] round_filter input=16 output=32
I1211 16:48:26.749454 139802979170176 efficientnet_model.py:148] round_filter input=16 output=32
I1211 16:48:26.749675 139802979170176 efficientnet_model.py:148] round_filter input=24 output=40
I1211 16:48:27.409350 139802979170176 efficientnet_model.py:148] round_filter input=24 output=40
I1211 16:48:27.409548 139802979170176 efficientnet_model.py:148] round_filter input=40 output=72
I1211 16:48:28.089735 139802979170176 efficientnet_model.py:148] round_filter input=40 output=72
I1211 16:48:28.089935 139802979170176 efficientnet_model.py:148] round_filter input=80 output=144
I1211 16:48:29.389571 139802979170176 efficientnet_model.py:148] round_filter input=80 output=144
I1211 16:48:29.389790 139802979170176 efficientnet_model.py:148] round_filter input=112 output=200
I1211 16:48:30.411971 139802979170176 efficientnet_model.py:148] round_filter input=112 output=200
I1211 16:48:30.412192 139802979170176 efficientnet_model.py:148] round_filter input=192 output=344
I1211 16:48:32.141842 139802979170176 efficientnet_model.py:148] round_filter input=192 output=344
I1211 16:48:32.142053 139802979170176 efficientnet_model.py:148] round_filter input=320 output=576
I1211 16:48:32.787437 139802979170176 efficientnet_model.py:148] round_filter input=1280
output=2304
I1211 16:48:32.885392 139802979170176 efficientnet_model.py:462] Building model efficientnet with
params ModelConfig(width_coefficient=1.8, depth_coefficient=2.6, resolution=528, dropout_rate=0.5,
blocks=(BlockConfig(input_filters=32, output_filters=16, kernel_size=3, num_repeat=1,
expand_ratio=1, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=16, output_filters=24, kernel_size=3,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=24, output_filters=40, kernel_size=5,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=40, output_filters=80, kernel_size=3,
num_repeat=3, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=80, output_filters=112, kernel_size=5,
num_repeat=3, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=112, output_filters=192, kernel_size=5,
num_repeat=4, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=192, output_filters=320, kernel_size=3,
num_repeat=1, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'))), stem_base_filters=32, top_base_filters=1280, activation='simple_swish',
batch_norm='default', bn_momentum=0.99, bn_epsilon=0.001, weight_decay=5e-06,
drop_connect_rate=0.2, depth_divisor=8, min_depth=None, use_se=True, input_channels=3,
num_classes=1000, model_name='efficientnet', rescale_input=False, data_format='channels_last', dty
pe='float32')
I1211 16:48:33.046751 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:144]
EfficientDet EfficientNet backbone version: efficientnet-b7
```

```
I1211 16:48:33.046960 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:145]
EfficientDet BiFPN num filters: 384
I1211 16:48:33.047059 139802979170176 ssd_efficientnet_bifpn_feature_extractor.py:147]
EfficientDet BiFPN num iterations: 8
I1211 16:48:33.053482 139802979170176 efficientnet_model.py:148] round_filter input=32 output=64
I1211 16:48:33.080885 139802979170176 efficientnet_model.py:148] round_filter input=32 output=64
I1211 16:48:33.081044 139802979170176 efficientnet_model.py:148] round_filter input=16 output=32
I1211 16:48:33.413821 139802979170176 efficientnet_model.py:148] round_filter input=16 output=32
I1211 16:48:33.414018 139802979170176 efficientnet_model.py:148] round_filter input=24 output=48
I1211 16:48:34.199675 139802979170176 efficientnet_model.py:148] round_filter input=24 output=48
I1211 16:48:34.199870 139802979170176 efficientnet_model.py:148] round_filter input=40 output=80
I1211 16:48:34.988937 139802979170176 efficientnet_model.py:148] round_filter input=40 output=80
I1211 16:48:34.989149 139802979170176 efficientnet_model.py:148] round_filter input=80 output=160
I1211 16:48:36.207931 139802979170176 efficientnet_model.py:148] round_filter input=80 output=160
I1211 16:48:36.208137 139802979170176 efficientnet_model.py:148] round_filter input=112 output=224
I1211 16:48:37.548801 139802979170176 efficientnet_model.py:148] round_filter input=112 output=224
I1211 16:48:37.548998 139802979170176 efficientnet_model.py:148] round_filter input=192 output=384
I1211 16:48:40.183334 139802979170176 efficientnet_model.py:148] round_filter input=192 output=384
I1211 16:48:40.183535 139802979170176 efficientnet_model.py:148] round_filter input=320 output=640
I1211 16:48:41.202285 139802979170176 efficientnet_model.py:148] round_filter input=1280
output=2560
I1211 16:48:41.328636 139802979170176 efficientnet_model.py:462] Building model efficientnet with
params ModelConfig(width_coefficient=2.0, depth_coefficient=3.1, resolution=600, dropout_rate=0.5,
blocks=(BlockConfig(input_filters=32, output_filters=16, kernel_size=3, num_repeat=1,
expand_ratio=1, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=16, output_filters=24, kernel_size=3,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=24, output_filters=40, kernel_size=5,
num_repeat=2, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=40, output_filters=80, kernel_size=3,
num_repeat=3, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=80, output_filters=112, kernel_size=5,
num_repeat=3, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=112, output_filters=192, kernel_size=5,
num_repeat=4, expand_ratio=6, strides=(2, 2), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise'), BlockConfig(input_filters=192, output_filters=320, kernel_size=3,
num_repeat=1, expand_ratio=6, strides=(1, 1), se_ratio=0.25, id_skip=True, fused_conv=False,
conv_type='depthwise')), stem_base_filters=32, top_base_filters=1280, activation='simple_swish', batch_norm='default', bn_momentum=0.99, bn_epsilon=0.001, weight_decay=5e-06,
drop_connect_rate=0.2, depth_divisor=8, min_depth=None, use_se=True, input_channels=3,
num_classes=1000, model_name='efficientnet', rescale_input=False, data_format='channels_last', dtype='float32')
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_ssd_models_from_config): 36.58s
I1211 16:48:41.528179 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_create_ssd_models_from_config): 36.58s
[ OK ] ModelBuilderTF2Test.test_create_ssd_models_from_config
[ RUN ] ModelBuilderTF2Test.test_invalid_faster_rcnn_batchnorm_update
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_invalid_faster_rcnn_batchnorm_update): 0.0s
I1211 16:48:41.538704 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_invalid_faster_rcnn_batchnorm_update): 0.0s
[ OK ] ModelBuilderTF2Test.test_invalid_faster_rcnn_batchnorm_update
[ RUN ] ModelBuilderTF2Test.test_invalid_first_stage_nms_iou_threshold
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_invalid_first_stage_nms_iou_threshold): 0.0s
I1211 16:48:41.541369 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_invalid_first_stage_nms_iou_threshold): 0.0s
[ OK ] ModelBuilderTF2Test.test_invalid_first_stage_nms_iou_threshold
[ RUN ] ModelBuilderTF2Test.test_invalid_model_config_proto
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_invalid_model_config_proto): 0.0s
I1211 16:48:41.542428 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_invalid_model_config_proto): 0.0s
[ OK ] ModelBuilderTF2Test.test_invalid_model_config_proto
[ RUN ] ModelBuilderTF2Test.test_invalid_second_stage_batch_size
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_invalid_second_stage_batch_size): 0.0s
I1211 16:48:41.544426 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_invalid_second_stage_batch_size): 0.0s
[ OK ] ModelBuilderTF2Test.test_invalid_second_stage_batch_size
[ RUN ] ModelBuilderTF2Test.test_session
[ SKIPPED ] ModelBuilderTF2Test.test_session
[ RUN ] ModelBuilderTF2Test.test_unknown_faster_rcnn_feature_extractor
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_unknown_faster_rcnn_feature_extractor): 0.0s
I1211 16:48:41.546773 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_unknown_faster_rcnn_feature_extractor): 0.0s
[ OK ] ModelBuilderTF2Test.test_unknown_faster_rcnn_feature_extractor
[ RUN ] ModelBuilderTF2Test.test_unknown_meta_architecture
INFO:tensorflow:time( main .ModelBuilderTF2Test.test_unknown_meta_architecture): 0.0s
```

```
I1211 16:48:41.547568 139802979170176 test_util.py:1973]      -      -
time(__main__.ModelBuilderTF2Test.test_unknown_meta_architecture): 0.0s
[ OK ] ModelBuilderTF2Test.test_unknown_meta_architecture
[ RUN      ] ModelBuilderTF2Test.test_unknown_ssd_feature_extractor
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_unknown_ssd_feature_extractor): 0.0s
I1211 16:48:41.549054 139802979170176 test_util.py:1973]
time(__main__.ModelBuilderTF2Test.test_unknown_ssd_feature_extractor): 0.0s
[ OK ] ModelBuilderTF2Test.test_unknown_ssd_feature_extractor
-----
Ran 20 tests in 43.383s
```

```
OK (skipped=1)
```

```
In [ ]:
```

```
#removing data folder in models/research/object_detection folder
!rm -rf /content/models/research/object_detection/data
```

```
In [ ]:
```

```
#copy our own created data folder in that folder
!cp -r /content/content/data /content/models/research/object_detection/
```

```
In [ ]:
```

```
import tensorflow as tf
if tf.test.gpu_device_name():
    print('Default GPU Device: {}'.format(tf.test.gpu_device_name()))
else:
    print("Please install GPU version of TF")
```

```
gpus = tf.config.experimental.list_physical_devices('GPU')
for gpu in gpus:
    tf.config.experimental.set_memory_growth(gpu, True)
```

```
Please install GPU version of TF
```

```
In [ ]:
```

```
#!rm -rf /content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2
```

```
In [ ]:
```

```
#!mkdir /content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2
```

1. Training Model:

```
In [ ]:
```

```
PIPELINE_CONFIG_PATH='/content/ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/pipeline.config'
MODEL_DIR='/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2'
NUM_TRAIN_STEPS=50000
SAMPLE_1_OF_N_EVAL_EXAMPLES=1
```

```
!python /content/models/research/object_detection/model_main_tf2.py
--model_dir=$MODEL_DIR \
--num_train_steps=$NUM_TRAIN_STEPS \
--sample_1_of_n_eval_examples=$SAMPLE_1_OF_N_EVAL_EXAMPLES \
--pipeline_config_path=$PIPELINE_CONFIG_PATH \
--alsologtostderr
```

```
2020-11-29 11:52:49.815303: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]
Successfully opened dynamic library libcudart.so.10.1
2020-11-29 11:52:51.821991: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]
Successfully opened dynamic library libcuda.so.1
```

2020-11-29 11:52:51.824311: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero
2020-11-29 11:52:51.824852: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1716] Found device 0 with properties:
pciBusID: 0000:00:04.0 name: Tesla P100-PCIE-16GB computeCapability: 6.0
coreClock: 1.3285GHz coreCount: 56 deviceMemorySize: 15.90GiB deviceMemoryBandwidth: 681.88GiB/s
2020-11-29 11:52:51.824902: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudart.so.10.1
2020-11-29 11:52:51.833615: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcublas.so.10
2020-11-29 11:52:51.835537: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcufft.so.10
2020-11-29 11:52:51.835892: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcurand.so.10
2020-11-29 11:52:51.837883: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcusolver.so.10
2020-11-29 11:52:51.846204: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcusparse.so.10
2020-11-29 11:52:51.850501: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudnn.so.7
2020-11-29 11:52:51.850669: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero
2020-11-29 11:52:51.851395: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero
2020-11-29 11:52:51.852387: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1858] Adding visible gpu devices: 0
2020-11-29 11:52:51.854207: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow b inary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instru ctions in performance-critical operations: AVX512F
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
2020-11-29 11:52:51.862954: I tensorflow/core/platform/profile_utils/cpu_utils.cc:104] CPU Frequency: 2000189999 Hz
2020-11-29 11:52:51.863168: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x1c53100 initialized for platform Host (this does not guarantee that XLA will be used). Devices: 2020-11-29 11:52:51.863198: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor dev ice (0): Host, Default Version
2020-11-29 11:52:51.953367: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero
2020-11-29 11:52:51.954021: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x1c52f40 initialized for platform CUDA (this does not guarantee that XLA will be used). Devices: 2020-11-29 11:52:51.954058: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor dev ice (0): Tesla P100-PCIE-16GB, Compute Capability 6.0
2020-11-29 11:52:51.954254: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero
2020-11-29 11:52:51.954763: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1716] Found device 0 with properties:
pciBusID: 0000:00:04.0 name: Tesla P100-PCIE-16GB computeCapability: 6.0
coreClock: 1.3285GHz coreCount: 56 deviceMemorySize: 15.90GiB deviceMemoryBandwidth: 681.88GiB/s
2020-11-29 11:52:51.954802: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudart.so.10.1
2020-11-29 11:52:51.954862: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcublas.so.10
2020-11-29 11:52:51.954885: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcufft.so.10
2020-11-29 11:52:51.954910: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcurand.so.10
2020-11-29 11:52:51.954929: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcusolver.so.10
2020-11-29 11:52:51.954948: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcusparse.so.10
2020-11-29 11:52:51.954982: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudnn.so.7
2020-11-29 11:52:51.955062: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero
2020-11-29 11:52:51.955596: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero
2020-11-29 11:52:51.956092: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1858] Adding visible gpu devices: 0
2020-11-29 11:52:51.956144: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudart.so.10.1

```
2020-11-29 11:52:52.565075: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1257] Device interconnect StreamExecutor with strength 1 edge matrix:  
2020-11-29 11:52:52.565136: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1263] 0  
2020-11-29 11:52:52.565147: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1276] 0: N  
2020-11-29 11:52:52.565367: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero  
2020-11-29 11:52:52.566036: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero  
2020-11-29 11:52:52.566605: W tensorflow/core/common_runtime/gpu/gpu_bfc_allocator.cc:39] Overriding allow_growth setting because the TF_FORCE_GPU_ALLOW_GROWTH environment variable is set. Original config value was 0.  
2020-11-29 11:52:52.566650: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1402] Created TensorFlow device (/job:localhost/replica:0/task:0/device:GPU:0 with 14640 MB memory) -> physical GPU (device: 0, name: Tesla P100-PCIE-16GB, pci bus id: 0000:00:04.0, compute capability: 6.0)  
INFO:tensorflow:Using MirroredStrategy with devices  
('/job:localhost/replica:0/task:0/device:GPU:0',)  
I1129 11:52:52.568727 140298216753024 mirrored_strategy.py:341] Using MirroredStrategy with devices ('/job:localhost/replica:0/task:0/device:GPU:0',)  
INFO:tensorflow:Maybe overwriting train_steps: 50000  
I1129 11:52:52.574011 140298216753024 config_util.py:552] Maybe overwriting train_steps: 50000  
INFO:tensorflow:Maybe overwriting use_bfloat16: False  
I1129 11:52:52.574205 140298216753024 config_util.py:552] Maybe overwriting use_bfloat16: False  
INFO:tensorflow:Reading unweighted datasets:  
['/content/models/research/object_detection/data/tf_record/train.record']  
I1129 11:52:52.632952 140298216753024 dataset_builder.py:148] Reading unweighted datasets:  
['/content/models/research/object_detection/data/tf_record/train.record']  
INFO:tensorflow:Reading record datasets for input file:  
['/content/models/research/object_detection/data/tf_record/train.record']  
I1129 11:52:52.634335 140298216753024 dataset_builder.py:77] Reading record datasets for input file: ['/content/models/research/object_detection/data/tf_record/train.record']  
INFO:tensorflow:Number of filenames to read: 1  
I1129 11:52:52.634485 140298216753024 dataset_builder.py:78] Number of filenames to read: 1  
WARNING:tensorflow:num readers has been reduced to 1 to match input file shards.  
W1129 11:52:52.634578 140298216753024 dataset_builder.py:86] num_readers has been reduced to 1 to match input file shards.  
WARNING:tensorflow:From /content/models/research/object_detection/builders/dataset_builder.py:103: parallel_interleave (from tensorflow.python.data.experimental.ops.interleave_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Use `tf.data.Dataset.interleave(map_func, cycle_length, block_length, num_parallel_calls=tf.data.experimental.AUTOTUNE)` instead. If sloppy execution is desired, use `tf.data.Options.experimental_deterministic`.  
W1129 11:52:52.661479 140298216753024 deprecation.py:323] From /content/models/research/object_detection/builders/dataset_builder.py:103: parallel_interleave (from tensorflow.python.data.experimental.ops.interleave_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Use `tf.data.Dataset.interleave(map_func, cycle_length, block_length, num_parallel_calls=tf.data.experimental.AUTOTUNE)` instead. If sloppy execution is desired, use `tf.data.Options.experimental_deterministic`.  
WARNING:tensorflow:From /content/models/research/object_detection/builders/dataset_builder.py:222: DatasetV1.map_with_legacy_function (from tensorflow.python.data.ops.dataset_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Use `tf.data.Dataset.map()`  
W1129 11:52:52.740702 140298216753024 deprecation.py:323] From /content/models/research/object_detection/builders/dataset_builder.py:222: DatasetV1.map_with_legacy_function (from tensorflow.python.data.ops.dataset_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Use `tf.data.Dataset.map()`  
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/tensorflow/python/util/dispatch.py:201: sparse_to_dense (from tensorflow.python.ops.sparse_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Create a `tf.sparse.SparseTensor` and use `tf.sparse.to_dense` instead.  
W1129 11:52:59.030142 140298216753024 deprecation.py:323] From /usr/local/lib/python3.6/dist-packages/tensorflow/python/util/dispatch.py:201: sparse_to_dense (from tensorflow.python.ops.sparse_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Create a `tf.sparse.SparseTensor` and use `tf.sparse.to_dense` instead.  
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-packages/tensorflow/python/util/dispatch.py:201: sample_distorted_bounding_box (from tensorflow.python.ops.image_ops_impl) is deprecated and will be removed in a future version.  
Instructions for updating:
```

```
`seed2` arg is deprecated. Use sample_distorted_bounding_box_v2 instead.  
W1129 11:53:01.803245 140298216753024 deprecation.py:323] From /usr/local/lib/python3.6/dist-  
packages/tensorflow/python/util/dispatch.py:201: sample_distorted_bounding_box (from  
tensorflow.python.ops.image_ops_impl) is deprecated and will be removed in a future version.  
Instructions for updating:  
'seed2` arg is deprecated. Use sample_distorted_bounding_box_v2 instead.  
WARNING:tensorflow:From /content/models/research/object_detection/inputs.py:281: to_float (from te-  
nsorflow.python.ops.math_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Use `tf.cast` instead.  
W1129 11:53:03.343005 140298216753024 deprecation.py:323] From  
/content/models/research/object_detection/inputs.py:281: to_float (from  
tensorflow.python.ops.math_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Use `tf.cast` instead.  
WARNING:tensorflow:From /content/models/research/object_detection/model_lib_v2.py:349:  
set_learning_phase (from tensorflow.python.keras.backend) is deprecated and will be removed after  
2020-10-11.  
Instructions for updating:  
Simply pass a True/False value to the `training` argument of the `__call__` method of your layer o-  
r model.  
W1129 11:53:14.255550 140294678075136 deprecation.py:323] From  
/content/models/research/object_detection/model_lib_v2.py:349: set_learning_phase (from  
tensorflow.python.keras.backend) is deprecated and will be removed after 2020-10-11.  
Instructions for updating:  
Simply pass a True/False value to the `training` argument of the `__call__` method of your layer o-  
r model.  
2020-11-29 11:53:35.208522: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 20  
460000 exceeds 10% of free system memory.  
2020-11-29 11:53:35.213368: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 20  
460000 exceeds 10% of free system memory.  
2020-11-29 11:53:35.218505: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 20  
460000 exceeds 10% of free system memory.  
2020-11-29 11:53:35.223387: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 20  
460000 exceeds 10% of free system memory.  
2020-11-29 11:53:35.228696: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 20  
460000 exceeds 10% of free system memory.  
2020-11-29 11:53:37.290177: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]  
Successfully opened dynamic library libcublas.so.10  
2020-11-29 11:53:38.718131: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]  
Successfully opened dynamic library libcudnn.so.7  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._groundtruth_lists  
W1129 11:53:45.395413 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._groundtruth_lists  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._box_predictor  
W1129 11:53:45.395731 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._batched_prediction_tensor_names  
W1129 11:53:45.395825 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._batched_prediction_tensor_names  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._box_prediction_head  
W1129 11:53:45.395895 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._box_prediction_head  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._box_predictor._prediction_heads  
W1129 11:53:45.395960 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._prediction_heads  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._box_predictor._sorted_head_names  
W1129 11:53:45.396040 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._sorted_head_names  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._additional_projection_layers  
W1129 11:53:45.396102 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._additional_projection_layers  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._base_tower_layers_for_heads  
W1129 11:53:45.396161 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._base_tower_layers_for_heads  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._head_scope_conv_layers  
W1129 11:53:45.396219 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._head_scope_conv_layers  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._box_prediction_head._box_encoder_layers  
W1129 11:53:45.396277 140298216753024 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._box_prediction_head._box_encoder_layers  
WARNING:tensorflow:Unresolved object in checkpoint:
```



```
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.1.moving_variance
W1129 11:53:45.426922 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.1.moving_variance
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.axis
W1129 11:53:45.427035 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.axis
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.gamma
W1129 11:53:45.427131 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.gamma
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.beta
W1129 11:53:45.427226 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.beta
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.moving_mean
W1129 11:53:45.427321 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.moving_mean
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.moving_variance
W1129 11:53:45.427415 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.moving_variance
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.axis
W1129 11:53:45.427510 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.axis
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.gamma
W1129 11:53:45.427615 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.gamma
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.beta
W1129 11:53:45.427710 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.beta
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.moving_mean
W1129 11:53:45.427819 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.moving_mean
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.moving_variance
W1129 11:53:45.427904 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.moving_variance
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.axis
W1129 11:53:45.428007 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.axis
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.gamma
W1129 11:53:45.428127 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.gamma
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.beta
W1129 11:53:45.428230 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.beta
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.moving_mean
W1129 11:53:45.428319 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.moving_mean
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.moving_variance
W1129 11:53:45.428410 140298216753024 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.moving_variance
WARNING:tensorflow:A checkpoint was restored (e.g. tf.train.Checkpoint.restore or
tf.keras.Model.load_weights) but not all checkpointed values were used. See above for specific iss
ues. Use expect_partial() on the load status object, e.g.
tf.train.Checkpoint.restore(...).expect_partial(), to silence these warnings, or use
assert_consumed() to make the check explicit. See
https://www.tensorflow.org/guide/checkpoint#loading\_mechanics for details.
W1129 11:53:45.428511 140298216753024 util.py:158] A checkpoint was restored (e.g.
tf.train.Checkpoint.restore or tf.keras.Model.load_weights) but not all checkpointed values were u
sed. See above for specific issues. Use expect_partial() on the load status object, e.g. tf.train.
Checkpoint.restore(...).expect_partial(), to silence these warnings, or use assert_consumed() to m
ake the check explicit. See https://www.tensorflow.org/guide/checkpoint#loading\_mechanics for deta
ils.
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-
packages/tensorflow/python/util/deprecation.py:574: calling map_fn_v2 (from
```

tensorflow.python.ops.map_fn) with dtype is deprecated and will be removed in a future version.
Instructions for updating:
Use fn_output_signature instead
W1129 11:53:58.817271 140294711645952 deprecation.py:506] From /usr/local/lib/python3.6/dist-packages/tensorflow/python/util/deprecation.py:574: calling map_fn_v2 (from tensorflow.python.ops.map_fn) with dtype is deprecated and will be removed in a future version.
Instructions for updating:
Use fn_output_signature instead
INFO:tensorflow:Step 45100 per-step time 1.443s loss=0.480
I1129 11:56:33.150400 140298216753024 model_lib_v2.py:651] Step 45100 per-step time 1.443s loss=0.480
INFO:tensorflow:Step 45200 per-step time 1.388s loss=0.429
I1129 11:58:49.047165 140298216753024 model_lib_v2.py:651] Step 45200 per-step time 1.388s loss=0.429
INFO:tensorflow:Step 45300 per-step time 1.347s loss=0.433
I1129 12:01:03.315776 140298216753024 model_lib_v2.py:651] Step 45300 per-step time 1.347s loss=0.433
INFO:tensorflow:Step 45400 per-step time 1.304s loss=0.467
I1129 12:03:16.397174 140298216753024 model_lib_v2.py:651] Step 45400 per-step time 1.304s loss=0.467
INFO:tensorflow:Step 45500 per-step time 1.293s loss=0.426
I1129 12:05:28.394001 140298216753024 model_lib_v2.py:651] Step 45500 per-step time 1.293s loss=0.426
INFO:tensorflow:Step 45600 per-step time 1.456s loss=0.491
I1129 12:07:42.277351 140298216753024 model_lib_v2.py:651] Step 45600 per-step time 1.456s loss=0.491
INFO:tensorflow:Step 45700 per-step time 1.326s loss=0.511
I1129 12:09:57.390444 140298216753024 model_lib_v2.py:651] Step 45700 per-step time 1.326s loss=0.511
INFO:tensorflow:Step 45800 per-step time 1.409s loss=0.461
I1129 12:12:12.540838 140298216753024 model_lib_v2.py:651] Step 45800 per-step time 1.409s loss=0.461
INFO:tensorflow:Step 45900 per-step time 1.399s loss=0.477
I1129 12:14:26.572349 140298216753024 model_lib_v2.py:651] Step 45900 per-step time 1.399s loss=0.477
INFO:tensorflow:Step 46000 per-step time 1.337s loss=0.507
I1129 12:16:40.749887 140298216753024 model_lib_v2.py:651] Step 46000 per-step time 1.337s loss=0.507
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
I1129 12:16:40.846100 140298216753024 cross_device_ops.py:443] Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
I1129 12:16:40.847250 140298216753024 cross_device_ops.py:443] Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
I1129 12:16:40.848922 140298216753024 cross_device_ops.py:443] Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
I1129 12:16:40.849859 140298216753024 cross_device_ops.py:443] Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
I1129 12:16:40.851485 140298216753024 cross_device_ops.py:443] Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
I1129 12:16:40.852257 140298216753024 cross_device_ops.py:443] Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
I1129 12:16:40.853745 140298216753024 cross_device_ops.py:443] Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').
I1129 12:16:40.854547 140298216753024 cross_device_ops.py:443] Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to ('/job:localhost/replica:0/task:0/device:CPU:0').

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('job:localhost/replica:0/task:0/device:CPU:0').  
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to  
('job:localhost/replica:0/task:0/device:CPU:0').  
I1129 12:16:40.856076 140298216753024 cross_device_ops.py:443] Reduce to  
/job:localhost/replica:0/task:0/device:CPU:0 then broadcast to  
('job:localhost/replica:0/task:0/device:CPU:0').  
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast to  
('job:localhost/replica:0/task:0/device:CPU:0').  
I1129 12:16:40.856816 140298216753024 cross_device_ops.py:443] Reduce to  
/job:localhost/replica:0/task:0/device:CPU:0 then broadcast to  
('job:localhost/replica:0/task:0/device:CPU:0').  
INFO:tensorflow:Step 46100 per-step time 1.331s loss=0.520  
I1129 12:18:53.698934 140298216753024 model_lib_v2.py:651] Step 46100 per-step time 1.331s  
loss=0.520  
INFO:tensorflow:Step 46200 per-step time 1.286s loss=0.423  
I1129 12:21:05.371007 140298216753024 model_lib_v2.py:651] Step 46200 per-step time 1.286s  
loss=0.423  
INFO:tensorflow:Step 46300 per-step time 1.341s loss=0.542  
I1129 12:23:19.899552 140298216753024 model_lib_v2.py:651] Step 46300 per-step time 1.341s  
loss=0.542  
INFO:tensorflow:Step 46400 per-step time 1.338s loss=0.436  
I1129 12:25:34.205792 140298216753024 model_lib_v2.py:651] Step 46400 per-step time 1.338s  
loss=0.436  
INFO:tensorflow:Step 46500 per-step time 1.312s loss=0.416  
I1129 12:27:49.032262 140298216753024 model_lib_v2.py:651] Step 46500 per-step time 1.312s  
loss=0.416  
INFO:tensorflow:Step 46600 per-step time 1.322s loss=0.473  
I1129 12:30:02.305346 140298216753024 model_lib_v2.py:651] Step 46600 per-step time 1.322s  
loss=0.473  
INFO:tensorflow:Step 46700 per-step time 1.408s loss=0.373  
I1129 12:32:16.213289 140298216753024 model_lib_v2.py:651] Step 46700 per-step time 1.408s  
loss=0.373  
INFO:tensorflow:Step 46800 per-step time 1.338s loss=0.413  
I1129 12:34:29.289922 140298216753024 model_lib_v2.py:651] Step 46800 per-step time 1.338s  
loss=0.413  
INFO:tensorflow:Step 46900 per-step time 1.440s loss=0.496  
I1129 12:36:42.275958 140298216753024 model_lib_v2.py:651] Step 46900 per-step time 1.440s  
loss=0.496  
INFO:tensorflow:Step 47000 per-step time 1.361s loss=0.470  
I1129 12:38:58.002815 140298216753024 model_lib_v2.py:651] Step 47000 per-step time 1.361s  
loss=0.470  
INFO:tensorflow:Step 47100 per-step time 1.325s loss=0.550  
I1129 12:41:14.035368 140298216753024 model_lib_v2.py:651] Step 47100 per-step time 1.325s  
loss=0.550  
INFO:tensorflow:Step 47200 per-step time 1.341s loss=0.518  
I1129 12:43:29.198870 140298216753024 model_lib_v2.py:651] Step 47200 per-step time 1.341s  
loss=0.518  
INFO:tensorflow:Step 47300 per-step time 1.502s loss=0.404  
I1129 12:45:43.134939 140298216753024 model_lib_v2.py:651] Step 47300 per-step time 1.502s  
loss=0.404  
INFO:tensorflow:Step 47400 per-step time 1.354s loss=0.543  
I1129 12:47:56.046941 140298216753024 model_lib_v2.py:651] Step 47400 per-step time 1.354s  
loss=0.543  
INFO:tensorflow:Step 47500 per-step time 1.329s loss=0.459  
I1129 12:50:08.655661 140298216753024 model_lib_v2.py:651] Step 47500 per-step time 1.329s  
loss=0.459  
INFO:tensorflow:Step 47600 per-step time 1.461s loss=0.482  
I1129 12:52:22.695516 140298216753024 model_lib_v2.py:651] Step 47600 per-step time 1.461s  
loss=0.482  
INFO:tensorflow:Step 47700 per-step time 1.397s loss=0.462  
I1129 12:54:38.797789 140298216753024 model_lib_v2.py:651] Step 47700 per-step time 1.397s  
loss=0.462  
INFO:tensorflow:Step 47800 per-step time 1.438s loss=0.376  
I1129 12:56:53.267682 140298216753024 model_lib_v2.py:651] Step 47800 per-step time 1.438s  
loss=0.376  
INFO:tensorflow:Step 47900 per-step time 1.284s loss=0.460  
I1129 12:59:06.078236 140298216753024 model_lib_v2.py:651] Step 47900 per-step time 1.284s  
loss=0.460  
INFO:tensorflow:Step 48000 per-step time 1.341s loss=0.428  
I1129 13:01:19.359173 140298216753024 model_lib_v2.py:651] Step 48000 per-step time 1.341s  
loss=0.428  
INFO:tensorflow:Step 48100 per-step time 1.301s loss=0.411  
I1129 13:03:32.368495 140298216753024 model_lib_v2.py:651] Step 48100 per-step time 1.301s  
loss=0.411  
INFO:tensorflow:Step 48200 per-step time 1.296s loss=0.476  
I1129 13:05:45.619551 140298216753024 model_lib_v2.py:651] Step 48200 per-step time 1.296s  
loss=0.476
```

```
INFO:tensorflow:Step 48300 per-step time 1.313s loss=0.454
I1129 13:08:00.027228 140298216753024 model_lib_v2.py:651] Step 48300 per-step time 1.313s
loss=0.454
INFO:tensorflow:Step 48400 per-step time 1.343s loss=0.500
I1129 13:10:15.397313 140298216753024 model_lib_v2.py:651] Step 48400 per-step time 1.343s
loss=0.500
INFO:tensorflow:Step 48500 per-step time 1.295s loss=0.441
I1129 13:12:29.867640 140298216753024 model_lib_v2.py:651] Step 48500 per-step time 1.295s
loss=0.441
INFO:tensorflow:Step 48600 per-step time 1.464s loss=0.538
I1129 13:14:43.386171 140298216753024 model_lib_v2.py:651] Step 48600 per-step time 1.464s
loss=0.538
INFO:tensorflow:Step 48700 per-step time 1.288s loss=0.450
I1129 13:16:55.853338 140298216753024 model_lib_v2.py:651] Step 48700 per-step time 1.288s
loss=0.450
INFO:tensorflow:Step 48800 per-step time 1.309s loss=0.469
I1129 13:19:08.541710 140298216753024 model_lib_v2.py:651] Step 48800 per-step time 1.309s
loss=0.469
INFO:tensorflow:Step 48900 per-step time 1.417s loss=0.492
I1129 13:21:22.848986 140298216753024 model_lib_v2.py:651] Step 48900 per-step time 1.417s
loss=0.492
INFO:tensorflow:Step 49000 per-step time 1.239s loss=0.489
I1129 13:23:37.464245 140298216753024 model_lib_v2.py:651] Step 49000 per-step time 1.239s
loss=0.489
INFO:tensorflow:Step 49100 per-step time 1.294s loss=0.396
I1129 13:25:53.288182 140298216753024 model_lib_v2.py:651] Step 49100 per-step time 1.294s
loss=0.396
INFO:tensorflow:Step 49200 per-step time 1.344s loss=0.447
I1129 13:28:06.633577 140298216753024 model_lib_v2.py:651] Step 49200 per-step time 1.344s
loss=0.447
INFO:tensorflow:Step 49300 per-step time 1.279s loss=0.542
I1129 13:30:20.235226 140298216753024 model_lib_v2.py:651] Step 49300 per-step time 1.279s
loss=0.542
INFO:tensorflow:Step 49400 per-step time 1.285s loss=0.534
I1129 13:32:33.109412 140298216753024 model_lib_v2.py:651] Step 49400 per-step time 1.285s
loss=0.534
INFO:tensorflow:Step 49500 per-step time 1.290s loss=0.416
I1129 13:34:46.612340 140298216753024 model_lib_v2.py:651] Step 49500 per-step time 1.290s
loss=0.416
INFO:tensorflow:Step 49600 per-step time 1.327s loss=0.483
I1129 13:37:01.618530 140298216753024 model_lib_v2.py:651] Step 49600 per-step time 1.327s
loss=0.483
INFO:tensorflow:Step 49700 per-step time 1.338s loss=0.460
I1129 13:39:15.962683 140298216753024 model_lib_v2.py:651] Step 49700 per-step time 1.338s
loss=0.460
INFO:tensorflow:Step 49800 per-step time 1.306s loss=0.523
I1129 13:41:30.787661 140298216753024 model_lib_v2.py:651] Step 49800 per-step time 1.306s
loss=0.523
INFO:tensorflow:Step 49900 per-step time 1.260s loss=0.469
I1129 13:43:44.511328 140298216753024 model_lib_v2.py:651] Step 49900 per-step time 1.260s
loss=0.469
INFO:tensorflow:Step 50000 per-step time 1.264s loss=0.470
I1129 13:45:56.685081 140298216753024 model_lib_v2.py:651] Step 50000 per-step time 1.264s
loss=0.470
```

In []:

```
PIPELINE_CONFIG_PATH='/content/ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/pipeline.config'
MODEL_DIR='/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2'
NUM_TRAIN_STEPS=60000
SAMPLE_1_OF_N_EVAL_EXAMPLES=1
```

```
!python /content/models/research/object_detection/model_main_tf2.py
--model_dir=$MODEL_DIR \
--num_train_steps=$NUM_TRAIN_STEPS \
--sample_1_of_n_eval_examples=$SAMPLE_1_OF_N_EVAL_EXAMPLES \
--pipeline_config_path=$PIPELINE_CONFIG_PATH \
--alsologtostderr
```

```
2020-11-29 15:45:34.842124: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]
Successfully opened dynamic library libcudart.so.10.1
2020-11-29 15:46:18.077768: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]
Successfully opened dynamic library libcuda.so.1
2020-11-29 15:46:18.142289: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful
NVIDIA node read from SysFS had negative value (-1) but there must be at least one NVIDIA node so re
```

NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero

2020-11-29 15:46:18.144036: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1716] Found device 0 with properties:

pciBusID: 0000:00:04.0 name: Tesla P100-PCIE-16GB computeCapability: 6.0

coreClock: 1.3285GHz coreCount: 56 deviceMemorySize: 15.90GiB deviceMemoryBandwidth: 681.88GiB/s

2020-11-29 15:46:18.144109: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudart.so.10.1

2020-11-29 15:46:18.242724: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcublas.so.10

2020-11-29 15:46:18.633351: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcufft.so.10

2020-11-29 15:46:18.642644: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcurand.so.10

2020-11-29 15:46:18.754837: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcusolver.so.10

2020-11-29 15:46:18.843597: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcusparse.so.10

2020-11-29 15:46:19.155546: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudnn.so.7

2020-11-29 15:46:19.156251: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero

2020-11-29 15:46:19.157448: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero

2020-11-29 15:46:19.158228: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1858] Adding visible gpu devices: 0

2020-11-29 15:46:19.160039: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow b inary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instru ctions in performance-critical operations: AVX512F

To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.

2020-11-29 15:46:19.353242: I tensorflow/core/platform/profile_utils/cpu_utils.cc:104] CPU Frequency: 2000189999 Hz

2020-11-29 15:46:19.353691: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x324d100 initialized for platform Host (this does not guarantee that XLA will be used). Devices: 2020-11-29 15:46:19.353922: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor dev ice (0): Host, Default Version

2020-11-29 15:46:19.671740: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero

2020-11-29 15:46:19.672484: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x324cf40 initialized for platform CUDA (this does not guarantee that XLA will be used). Devices: 2020-11-29 15:46:19.672522: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor dev ice (0): Tesla P100-PCIE-16GB, Compute Capability 6.0

2020-11-29 15:46:19.672755: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero

2020-11-29 15:46:19.673331: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1716] Found device 0 with properties:

pciBusID: 0000:00:04.0 name: Tesla P100-PCIE-16GB computeCapability: 6.0

coreClock: 1.3285GHz coreCount: 56 deviceMemorySize: 15.90GiB deviceMemoryBandwidth: 681.88GiB/s

2020-11-29 15:46:19.673380: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudart.so.10.1

2020-11-29 15:46:19.673484: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcublas.so.10

2020-11-29 15:46:19.673512: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcufft.so.10

2020-11-29 15:46:19.673541: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcurand.so.10

2020-11-29 15:46:19.673576: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcusolver.so.10

2020-11-29 15:46:19.673598: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcusparse.so.10

2020-11-29 15:46:19.673619: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudnn.so.7

2020-11-29 15:46:19.673713: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero

2020-11-29 15:46:19.674309: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re turning NUMA node zero

2020-11-29 15:46:19.674802: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1858] Adding visible gpu devices: 0

2020-11-29 15:46:19.744076: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudart.so.10.1

2020-11-29 15:46:32.357023: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1257] Device interconnect StreamExecutor with strength 1 edge matrix.

```
interconnect streamexecutor with strength + edge matrix.
2020-11-29 15:46:32.357080: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1263]      0
2020-11-29 15:46:32.357098: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1276] 0: N
2020-11-29 15:46:32.357428: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful
NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re
turning NUMA node zero
2020-11-29 15:46:32.358374: I tensorflow/stream_executor/cuda/cuda_gpu_executor.cc:982] successful
NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so re
turning NUMA node zero
2020-11-29 15:46:32.359127: W tensorflow/core/common_runtime/gpu/gpu_bfc_allocator.cc:39]
Overriding allow_growth setting because the TF_FORCE_GPU_ALLOW_GROWTH environment variable is set.
Original config value was 0.
2020-11-29 15:46:32.436952: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1402] Created
TensorFlow device (/job:localhost/replica:0/task:0/device:GPU:0 with 14640 MB memory) -> physical
GPU (device: 0, name: Tesla P100-PCIE-16GB, pci bus id: 0000:00:04.0, compute capability: 6.0)
INFO:tensorflow:Using MirroredStrategy with devices
('/job:localhost/replica:0/task:0/device:GPU:0',)
I1129 15:46:32.455492 140449625356160 mirrored_strategy.py:341] Using MirroredStrategy with
devices ('/job:localhost/replica:0/task:0/device:GPU:0',)
INFO:tensorflow:Maybe overwriting train_steps: 60000
I1129 15:46:32.551657 140449625356160 config_util.py:552] Maybe overwriting train_steps: 60000
INFO:tensorflow:Maybe overwriting use_bfloat16: False
I1129 15:46:32.552034 140449625356160 config_util.py:552] Maybe overwriting use_bfloat16: False
INFO:tensorflow:Reading unweighted datasets:
['/content/models/research/object_detection/data/tf_record/train.record']
I1129 15:46:32.757665 140449625356160 dataset_builder.py:148] Reading unweighted datasets:
['/content/models/research/object_detection/data/tf_record/train.record']
INFO:tensorflow:Reading record datasets for input file:
['/content/models/research/object_detection/data/tf_record/train.record']
I1129 15:46:32.837580 140449625356160 dataset_builder.py:77] Reading record datasets for input fil
e: ['/content/models/research/object_detection/data/tf_record/train.record']
INFO:tensorflow:Number of filenames to read: 1
I1129 15:46:32.837825 140449625356160 dataset_builder.py:78] Number of filenames to read: 1
WARNING:tensorflow:num_readers has been reduced to 1 to match input file shards.
W1129 15:46:32.837942 140449625356160 dataset_builder.py:86] num_readers has been reduced to 1 to
match input file shards.
WARNING:tensorflow:From /content/models/research/object_detection/builders/dataset_builder.py:103:
parallel_interleave (from tensorflow.python.data.experimental.ops.interleave_ops) is deprecated
and will be removed in a future version.
Instructions for updating:
Use `tf.data.Dataset.interleave(map_func, cycle_length, block_length,
num_parallel_calls=tf.data.experimental.AUTOTUNE)` instead. If sloppy execution is desired, use `t
f.data.Options.experimental_deterministic`.
W1129 15:46:32.844601 140449625356160 deprecation.py:323] From
/content/models/research/object_detection/builders/dataset_builder.py:103: parallel_interleave (fr
om tensorflow.python.data.experimental.ops.interleave_ops) is deprecated and will be removed in a
future version.
Instructions for updating:
Use `tf.data.Dataset.interleave(map_func, cycle_length, block_length,
num_parallel_calls=tf.data.experimental.AUTOTUNE)` instead. If sloppy execution is desired, use `t
f.data.Options.experimental_deterministic`.
WARNING:tensorflow:From /content/models/research/object_detection/builders/dataset_builder.py:222:
DatasetV1.map_with_legacy_function (from tensorflow.python.data.ops.dataset_ops) is deprecated and
will be removed in a future version.
Instructions for updating:
Use `tf.data.Dataset.map()
W1129 15:46:33.160674 140449625356160 deprecation.py:323] From
/content/models/research/object_detection/builders/dataset_builder.py:222:
DatasetV1.map_with_legacy_function (from tensorflow.python.data.ops.dataset_ops) is deprecated and
will be removed in a future version.
Instructions for updating:
Use `tf.data.Dataset.map()
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-
packages/tensorflow/python/util/dispatch.py:201: sparse_to_dense (from
tensorflow.python.ops.sparse_ops) is deprecated and will be removed in a future version.
Instructions for updating:
Create a `tf.sparse.SparseTensor` and use `tf.sparse.to_dense` instead.
W1129 15:46:41.049354 140449625356160 deprecation.py:323] From /usr/local/lib/python3.6/dist-
packages/tensorflow/python/util/dispatch.py:201: sparse_to_dense (from
tensorflow.python.ops.sparse_ops) is deprecated and will be removed in a future version.
Instructions for updating:
Create a `tf.sparse.SparseTensor` and use `tf.sparse.to_dense` instead.
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-
packages/tensorflow/python/util/dispatch.py:201: sample_distorted_bounding_box (from
tensorflow.python.ops.image_ops_impl) is deprecated and will be removed in a future version.
Instructions for updating:
`seed2` arg is deprecated. Use sample_distorted_bounding_box_v2 instead.
W1129 15:46:41.160600 140449625356160 deprecation.py:323] From /usr/local/lib/python3.6/dist-
```

```
W1129 15:46:44.409099 140449625356160 deprecation.py:323] From /usr/local/tensorflow/python/_pywrap_tensorflow_internal.so:100 - packages/tensorflow/python/util/dispatch.py:201: sample_distorted_bounding_box (from tensorflow.python.ops.image_ops_impl) is deprecated and will be removed in a future version.  
Instructions for updating:  
`seed2` arg is deprecated. Use sample_distorted_bounding_box_v2 instead.  
WARNING:tensorflow:From /content/models/research/object_detection/inputs.py:281: to_float (from tensorflow.python.ops.math_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Use `tf.cast` instead.  
W1129 15:46:46.633744 140449625356160 deprecation.py:323] From /content/models/research/object_detection/inputs.py:281: to_float (from tensorflow.python.ops.math_ops) is deprecated and will be removed in a future version.  
Instructions for updating:  
Use `tf.cast` instead.  
WARNING:tensorflow:From /content/models/research/object_detection/model_lib_v2.py:349: set_learning_phase (from tensorflow.python.keras.backend) is deprecated and will be removed after 2020-10-11.  
Instructions for updating:  
Simply pass a True/False value to the `training` argument of the `__call__` method of your layer or model.  
W1129 15:46:59.589694 140446086936320 deprecation.py:323] From /content/models/research/object_detection/model_lib_v2.py:349: set_learning_phase (from tensorflow.python.keras.backend) is deprecated and will be removed after 2020-10-11.  
Instructions for updating:  
Simply pass a True/False value to the `training` argument of the `__call__` method of your layer or model.  
2020-11-29 15:47:28.339455: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcublas.so.10  
2020-11-29 15:47:32.837650: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library libcudnn.so.7  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._groundtruth_lists  
W1129 15:47:40.453989 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._groundtruth_lists  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._box_predictor  
W1129 15:47:40.454341 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._batched_prediction_tensor_names  
W1129 15:47:40.454434 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._batched_prediction_tensor_names  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._box_prediction_head  
W1129 15:47:40.454505 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._box_prediction_head  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._box_predictor._prediction_heads  
W1129 15:47:40.454599 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._prediction_heads  
WARNING:tensorflow:Unresolved object in checkpoint: (root).model._box_predictor._sorted_head_names  
W1129 15:47:40.454690 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._sorted_head_names  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._additional_projection_layers  
W1129 15:47:40.454754 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._additional_projection_layers  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._base_tower_layers_for_heads  
W1129 15:47:40.454817 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._base_tower_layers_for_heads  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._head_scope_conv_layers  
W1129 15:47:40.454892 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._head_scope_conv_layers  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._box_prediction_head._box_encoder_layers  
W1129 15:47:40.454948 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._box_prediction_head._box_encoder_layers  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._prediction_heads.class_predictions_with_background  
W1129 15:47:40.455025 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._prediction_heads.class_predictions_with_background  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._additional_projection_layers.0  
W1129 15:47:40.455102 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._additional_projection_layers.0  
WARNING:tensorflow:Unresolved object in checkpoint:  
(root).model._box_predictor._additional_projection_layers.1  
W1129 15:47:40.455178 140449625356160 util.py:150] Unresolved object in checkpoint:  
(root).model._box_predictor._additional_projection_layers.1
```



```
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.beta
W1129 15:47:40.523405 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.beta
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.moving_mean
W1129 15:47:40.523533 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.moving_mean
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.moving_variance
W1129 15:47:40.523621 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.4.moving_variance
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.axis
W1129 15:47:40.523708 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.axis
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.gamma
W1129 15:47:40.523819 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.gamma
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.beta
W1129 15:47:40.523905 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.beta
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.moving_mean
W1129 15:47:40.524015 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.moving_mean
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.moving_variance
W1129 15:47:40.524106 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.7.moving_variance
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.axis
W1129 15:47:40.524193 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.axis
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.gamma
W1129 15:47:40.524280 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.gamma
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.beta
W1129 15:47:40.524365 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.beta
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.moving_mean
W1129 15:47:40.524491 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.moving_mean
WARNING:tensorflow:Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.moving_variance
W1129 15:47:40.524592 140449625356160 util.py:150] Unresolved object in checkpoint:
(root).model._box_predictor._base_tower_layers_for_heads.box_encodings.4.10.moving_variance
WARNING:tensorflow:A checkpoint was restored (e.g. tf.train.Checkpoint.restore or
tf.keras.Model.load_weights) but not all checkpointed values were used. See above for specific iss
ues. Use expect_partial() on the load status object, e.g.
tf.train.Checkpoint.restore(...).expect_partial(), to silence these warnings, or use
assert_consumed() to make the check explicit. See
https://www.tensorflow.org/guide/checkpoint#loading\_mechanics for details.
W1129 15:47:40.524688 140449625356160 util.py:158] A checkpoint was restored (e.g.
tf.train.Checkpoint.restore or tf.keras.Model.load_weights) but not all checkpointed values were u
sed. See above for specific issues. Use expect_partial() on the load status object, e.g. tf.train.
Checkpoint.restore(...).expect_partial(), to silence these warnings, or use assert_consumed() to m
ake the check explicit. See https://www.tensorflow.org/guide/checkpoint#loading\_mechanics for deta
ils.
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-
packages/tensorflow/python/util/deprecation.py:574: calling map_fn_v2 (from
tensorflow.python.ops.map_fn) with dtype is deprecated and will be removed in a future version.
Instructions for updating:
Use fn_output_signature instead
W1129 15:47:50.151561 140446120507136 deprecation.py:506] From /usr/local/lib/python3.6/dist-
packages/tensorflow/python/util/deprecation.py:574: calling map_fn_v2 (from
tensorflow.python.ops.map_fn) with dtype is deprecated and will be removed in a future version.
Instructions for updating:
Use fn_output_signature instead
INFO:tensorflow:Step 55100 per-step time 1.373s loss=0.448
I1129 15:50:24.041122 140449625356160 model_lib_v2.py:651] Step 55100 per-step time 1.373s
loss=0.448
TNFO:tensorflow:Step 55200 per-step time 1.347s loss=0.412
```

```
INFO:tensorflow:Step 55200 per-step time 1.347s loss=0.412
I1129 15:52:38.845990 140449625356160 model_lib_v2.py:651] Step 55200 per-step time 1.347s loss=0.412
INFO:tensorflow:Step 55300 per-step time 1.415s loss=0.456
I1129 15:54:54.368891 140449625356160 model_lib_v2.py:651] Step 55300 per-step time 1.415s loss=0.456
INFO:tensorflow:Step 55400 per-step time 1.293s loss=0.484
I1129 15:57:09.472525 140449625356160 model_lib_v2.py:651] Step 55400 per-step time 1.293s loss=0.484
INFO:tensorflow:Step 55500 per-step time 1.337s loss=0.425
I1129 15:59:24.925886 140449625356160 model_lib_v2.py:651] Step 55500 per-step time 1.337s loss=0.425
INFO:tensorflow:Step 55600 per-step time 1.387s loss=0.416
I1129 16:01:41.930721 140449625356160 model_lib_v2.py:651] Step 55600 per-step time 1.387s loss=0.416
```

2. Model Export:

In []:

```
!python /content/models/research/object_detection/exporter_main_v2.py \
--input_type image_tensor \
--pipeline_config_path /content/ssd_mobilenet_v2_fpnlite_640x640_coco17_tpu-8/pipeline.config \
--trained_checkpoint_dir
/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2 \
--output_directory /content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/exporter2
```

3. Model Evaluation:

In []:

```
!python /content/models/research/object_detection/model_main_tf2.py \
--model_dir=/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/exporter2/checkpoint \
--pipeline_config_path=/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/exporter2/pipeline.config \
--checkpoint_dir=/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2
```

```
2020-12-02 00:08:36.752670: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]
Successfully opened dynamic library libcudart.so.10.1
WARNING:tensorflow:Forced number of epochs for all eval validations to be 1.
W1202 00:08:39.259541 139984855218048 model_lib_v2.py:1026] Forced number of epochs for all eval validations to be 1.
INFO:tensorflow:Maybe overwriting sample_1_of_n_eval_examples: None
I1202 00:08:39.259824 139984855218048 config_util.py:552] Maybe overwriting sample_1_of_n_eval_examples: None
INFO:tensorflow:Maybe overwriting use_bfloat16: False
I1202 00:08:39.259965 139984855218048 config_util.py:552] Maybe overwriting use_bfloat16: False
INFO:tensorflow:Maybe overwriting eval_num_epochs: 1
I1202 00:08:39.260063 139984855218048 config_util.py:552] Maybe overwriting eval_num_epochs: 1
WARNING:tensorflow:Expected number of evaluation epochs is 1, but instead encountered `eval_on_train_input_config.num_epochs` = 0. Overwriting `num_epochs` to 1.
W1202 00:08:39.260191 139984855218048 model_lib_v2.py:1041] Expected number of evaluation epochs is 1, but instead encountered `eval_on_train_input_config.num_epochs` = 0. Overwriting `num_epochs` to 1.
2020-12-02 00:08:39.270672: I tensorflow/stream_executor/platform/default/dso_loader.cc:48]
Successfully opened dynamic library libcuda.so.1
2020-12-02 00:08:39.280770: E tensorflow/stream_executor/cuda/cuda_driver.cc:314] failed call to cuInit: CUDA_ERROR_NO_DEVICE: no CUDA-capable device is detected
2020-12-02 00:08:39.280827: I tensorflow/stream_executor/cuda/cuda_diagnostics.cc:156] kernel driver does not appear to be running on this host (c777fb061dfe): /proc/driver/nvidia/version does not exist
2020-12-02 00:08:39.287166: I tensorflow/core/platform/profile_utils/cpu_utils.cc:104] CPU Frequency: 2200000000 Hz
2020-12-02 00:08:39.287449: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x2ba7100 initialized for platform Host (this does not guarantee that XLA will be used). Devices: 2020-12-02 00:08:39.287492: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor dev
```

```
ice (0): Host, Default Version
INFO:tensorflow:Reading unweighted datasets:
['/content/models/research/object_detection/data/tf_record/test.record']
I1202 00:08:39.340945 139984855218048 dataset_builder.py:148] Reading unweighted datasets:
['/content/models/research/object_detection/data/tf_record/test.record']
INFO:tensorflow:Reading record datasets for input file:
['/content/models/research/object_detection/data/tf_record/test.record']
I1202 00:08:39.341945 139984855218048 dataset_builder.py:77] Reading record datasets for input file:
['/content/models/research/object_detection/data/tf_record/test.record']
INFO:tensorflow:Number of filenames to read: 1
I1202 00:08:39.342133 139984855218048 dataset_builder.py:78] Number of filenames to read: 1
WARNING:tensorflow:num_readers has been reduced to 1 to match input file shards.
W1202 00:08:39.342235 139984855218048 dataset_builder.py:86] num_readers has been reduced to 1 to
match input file shards.
WARNING:tensorflow:From /content/models/research/object_detection/builders/dataset_builder.py:103:
parallel_interleave (from tensorflow.python.data.experimental.ops.interleave_ops) is deprecated
and will be removed in a future version.
Instructions for updating:
Use `tf.data.Dataset.interleave(map_func, cycle_length, block_length,
num_parallel_calls=tf.data.experimental.AUTOTUNE)` instead. If sloppy execution is desired, use `tf.data.Options.experimental_deterministic`.
W1202 00:08:39.360286 139984855218048 deprecation.py:323] From
/content/models/research/object_detection/builders/dataset_builder.py:103: parallel_interleave (fr
om tensorflow.python.data.experimental.ops.interleave_ops) is deprecated and will be removed in a
future version.
Instructions for updating:
Use `tf.data.Dataset.interleave(map_func, cycle_length, block_length,
num_parallel_calls=tf.data.experimental.AUTOTUNE)` instead. If sloppy execution is desired, use `t
f.data.Options.experimental_deterministic`.
WARNING:tensorflow:From /content/models/research/object_detection/builders/dataset_builder.py:222:
DatasetV1.map_with_legacy_function (from tensorflow.python.data.ops.dataset_ops) is deprecated and
will be removed in a future version.
Instructions for updating:
Use `tf.data.Dataset.map()
W1202 00:08:39.460162 139984855218048 deprecation.py:323] From
/content/models/research/object_detection/builders/dataset_builder.py:222:
DatasetV1.map_with_legacy_function (from tensorflow.python.data.ops.dataset_ops) is deprecated and
will be removed in a future version.
Instructions for updating:
Use `tf.data.Dataset.map()
WARNING:tensorflow:From /usr/local/lib/python3.6/dist-
packages/tensorflow/python/util/dispatch.py:201: sparse_to_dense (from
tensorflow.python.ops.sparse_ops) is deprecated and will be removed in a future version.
Instructions for updating:
Create a `tf.sparse.SparseTensor` and use `tf.sparse.to_dense` instead.
W1202 00:08:43.610389 139984855218048 deprecation.py:323] From /usr/local/lib/python3.6/dist-
packages/tensorflow/python/util/dispatch.py:201: sparse_to_dense (from
tensorflow.python.ops.sparse_ops) is deprecated and will be removed in a future version.
Instructions for updating:
Create a `tf.sparse.SparseTensor` and use `tf.sparse.to_dense` instead.
WARNING:tensorflow:From /content/models/research/object_detection/inputs.py:281: to_float (from te
nsorflow.python.ops.math_ops) is deprecated and will be removed in a future version.
Instructions for updating:
Use `tf.cast` instead.
W1202 00:08:44.906716 139984855218048 deprecation.py:323] From
/content/models/research/object_detection/inputs.py:281: to_float (from
tensorflow.python.ops.math_ops) is deprecated and will be removed in a future version.
Instructions for updating:
Use `tf.cast` instead.
INFO:tensorflow:Waiting for new checkpoint at
/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2
I1202 00:08:47.863968 139984855218048 checkpoint_utils.py:125] Waiting for new checkpoint at
/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2
INFO:tensorflow:Found new checkpoint at
/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2/ckpt-61
I1202 00:08:48.530231 139984855218048 checkpoint_utils.py:134] Found new checkpoint at
/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2/ckpt-61
WARNING:tensorflow:From /content/models/research/object_detection/model_lib_v2.py:811:
set_learning_phase (from tensorflow.python.keras.backend) is deprecated and will be removed after
2020-10-11.
Instructions for updating:
Simply pass a True/False value to the `training` argument of the `__call__` method of your layer o
r model.
W1202 00:08:51.640854 139984855218048 deprecation.py:323] From
/content/models/research/object_detection/model_lib_v2.py:811: set_learning_phase (from
tensorflow.python.keras.backend) is deprecated and will be removed after 2020-10-11.
Instructions for updating:
```

```
Simply pass a True/False value to the `training` argument of the `__call__` method of your layer or model.
2020-12-02 00:09:19.320983: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 39
321600 exceeds 10% of free system memory.
WARNING:tensorflow:From /content/models/research/object_detection/eval_util.py:927: to_int64 (from
tensorflow.python.ops.math_ops) is deprecated and will be removed in a future version.
Instructions for updating:
Use `tf.cast` instead.
W1202 00:09:19.725625 139984855218048 deprecation.py:323] From
/content/models/research/object_detection/eval_util.py:927: to_int64 (from
tensorflow.python.ops.math_ops) is deprecated and will be removed in a future version.
Instructions for updating:
Use `tf.cast` instead.
INFO:tensorflow:Finished eval step 0
I1202 00:09:19.730495 139984855218048 model_lib_v2.py:905] Finished eval step 0
WARNING:tensorflow:From
/content/models/research/object_detection/utils/visualization_utils.py:617: py_func (from
tensorflow.python.ops.script_ops) is deprecated and will be removed in a future version.
Instructions for updating:
tf.py_func is deprecated in TF V2. Instead, there are two
options available in V2.
- tf.py_function takes a python function which manipulates tf eager
tensors instead of numpy arrays. It's easy to convert a tf eager tensor to
an ndarray (just call tensor.numpy()) but having access to eager tensors
means `tf.py_function`s can use accelerators such as GPUs as well as
being differentiable using a gradient tape.
- tf.numpy_function maintains the semantics of the deprecated tf.py_func
(it is not differentiable, and manipulates numpy arrays). It drops the
stateful argument making all functions stateful.

W1202 00:09:19.874042 139984855218048 deprecation.py:323] From
/content/models/research/object_detection/utils/visualization_utils.py:617: py_func (from
tensorflow.python.ops.script_ops) is deprecated and will be removed in a future version.
Instructions for updating:
tf.py_func is deprecated in TF V2. Instead, there are two
options available in V2.
- tf.py_function takes a python function which manipulates tf eager
tensors instead of numpy arrays. It's easy to convert a tf eager tensor to
an ndarray (just call tensor.numpy()) but having access to eager tensors
means `tf.py_function`s can use accelerators such as GPUs as well as
being differentiable using a gradient tape.
- tf.numpy_function maintains the semantics of the deprecated tf.py_func
(it is not differentiable, and manipulates numpy arrays). It drops the
stateful argument making all functions stateful.

2020-12-02 00:09:20.196256: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 39
321600 exceeds 10% of free system memory.
2020-12-02 00:09:20.855958: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 39
321600 exceeds 10% of free system memory.
2020-12-02 00:09:21.545964: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 39
321600 exceeds 10% of free system memory.
2020-12-02 00:09:22.243003: W tensorflow/core/framework/cpu_allocator_impl.cc:81] Allocation of 39
321600 exceeds 10% of free system memory.
INFO:tensorflow:Finished eval step 100
I1202 00:10:06.301419 139984855218048 model_lib_v2.py:905] Finished eval step 100
INFO:tensorflow:Finished eval step 200
I1202 00:10:50.312194 139984855218048 model_lib_v2.py:905] Finished eval step 200
INFO:tensorflow:Finished eval step 300
I1202 00:11:34.977371 139984855218048 model_lib_v2.py:905] Finished eval step 300
INFO:tensorflow:Finished eval step 400
I1202 00:12:19.820487 139984855218048 model_lib_v2.py:905] Finished eval step 400
INFO:tensorflow:Finished eval step 500
I1202 00:13:04.186693 139984855218048 model_lib_v2.py:905] Finished eval step 500
INFO:tensorflow:Finished eval step 600
I1202 00:13:48.716413 139984855218048 model_lib_v2.py:905] Finished eval step 600
INFO:tensorflow:Finished eval step 700
I1202 00:14:32.834083 139984855218048 model_lib_v2.py:905] Finished eval step 700
INFO:tensorflow:Finished eval step 800
I1202 00:15:16.950419 139984855218048 model_lib_v2.py:905] Finished eval step 800
INFO:tensorflow:Finished eval step 900
I1202 00:16:00.591503 139984855218048 model_lib_v2.py:905] Finished eval step 900
INFO:tensorflow:Finished eval step 1000
I1202 00:16:44.189414 139984855218048 model_lib_v2.py:905] Finished eval step 1000
INFO:tensorflow:Finished eval step 1100
I1202 00:17:29.842227 139984855218048 model_lib_v2.py:905] Finished eval step 1100
INFO:tensorflow:Finished eval step 1200
I1202 00:18:14.470554 139984855218048 model lib v2.py:905] Finished eval step 1200
```

```
INFO:tensorflow:Finished eval step 1300
I1202 00:18:58.741730 139984855218048 model_lib_v2.py:905] Finished eval step 1300
INFO:tensorflow:Finished eval step 1400
I1202 00:19:43.164591 139984855218048 model_lib_v2.py:905] Finished eval step 1400
INFO:tensorflow:Finished eval step 1500
I1202 00:20:27.451046 139984855218048 model_lib_v2.py:905] Finished eval step 1500
INFO:tensorflow:Finished eval step 1600
I1202 00:21:12.899626 139984855218048 model_lib_v2.py:905] Finished eval step 1600
INFO:tensorflow:Finished eval step 1700
I1202 00:21:57.437604 139984855218048 model_lib_v2.py:905] Finished eval step 1700
INFO:tensorflow:Finished eval step 1800
I1202 00:22:42.677354 139984855218048 model_lib_v2.py:905] Finished eval step 1800
INFO:tensorflow:Finished eval step 1900
I1202 00:23:27.124357 139984855218048 model_lib_v2.py:905] Finished eval step 1900
INFO:tensorflow:Finished eval step 2000
I1202 00:24:11.461725 139984855218048 model_lib_v2.py:905] Finished eval step 2000
INFO:tensorflow:Finished eval step 2100
I1202 00:24:55.909708 139984855218048 model_lib_v2.py:905] Finished eval step 2100
INFO:tensorflow:Finished eval step 2200
I1202 00:25:39.916600 139984855218048 model_lib_v2.py:905] Finished eval step 2200
INFO:tensorflow:Finished eval step 2300
I1202 00:26:23.792777 139984855218048 model_lib_v2.py:905] Finished eval step 2300
INFO:tensorflow:Finished eval step 2400
I1202 00:27:07.780577 139984855218048 model_lib_v2.py:905] Finished eval step 2400
INFO:tensorflow:Finished eval step 2500
I1202 00:27:52.199038 139984855218048 model_lib_v2.py:905] Finished eval step 2500
INFO:tensorflow:Finished eval step 2600
I1202 00:28:36.400007 139984855218048 model_lib_v2.py:905] Finished eval step 2600
INFO:tensorflow:Finished eval step 2700
I1202 00:29:20.336638 139984855218048 model_lib_v2.py:905] Finished eval step 2700
INFO:tensorflow:Finished eval step 2800
I1202 00:30:04.327071 139984855218048 model_lib_v2.py:905] Finished eval step 2800
INFO:tensorflow:Finished eval step 2900
I1202 00:30:48.046124 139984855218048 model_lib_v2.py:905] Finished eval step 2900
INFO:tensorflow:Performing evaluation on 2914 images.
I1202 00:30:53.505142 139984855218048 coco_evaluation.py:293] Performing evaluation on 2914
images.
creating index...
index created!
INFO:tensorflow:Loading and preparing annotation results...
I1202 00:30:53.521015 139984855218048 coco_tools.py:116] Loading and preparing annotation
results...
INFO:tensorflow:DONE (t=0.22s)
I1202 00:30:53.742913 139984855218048 coco_tools.py:138] DONE (t=0.22s)
creating index...
index created!
Running per image evaluation...
Evaluate annotation type *bbox*
DONE (t=15.49s).
Accumulating evaluation results...
DONE (t=5.07s).
Average Precision (AP) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.165
Average Precision (AP) @[ IoU=0.50 | area= all | maxDets=100 ] = 0.375
Average Precision (AP) @[ IoU=0.75 | area= all | maxDets=100 ] = 0.115
Average Precision (AP) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.066
Average Precision (AP) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.148
Average Precision (AP) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.217
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 1 ] = 0.208
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets= 10 ] = 0.362
Average Recall (AR) @[ IoU=0.50:0.95 | area= all | maxDets=100 ] = 0.398
Average Recall (AR) @[ IoU=0.50:0.95 | area= small | maxDets=100 ] = 0.252
Average Recall (AR) @[ IoU=0.50:0.95 | area=medium | maxDets=100 ] = 0.390
Average Recall (AR) @[ IoU=0.50:0.95 | area= large | maxDets=100 ] = 0.450
INFO:tensorflow:Eval metrics at step 60000
I1202 00:31:14.718542 139984855218048 model_lib_v2.py:954] Eval metrics at step 60000
INFO:tensorflow: + DetectionBoxes_Precision/mAP: 0.165300
I1202 00:31:14.744487 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Precision/mAP:
0.165300
INFO:tensorflow: + DetectionBoxes_Precision/mAP@.50IOU: 0.375180
I1202 00:31:14.745597 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Precision/mAP@.50IOU:
0.375180
INFO:tensorflow: + DetectionBoxes_Precision/mAP@.75IOU: 0.115219
I1202 00:31:14.746318 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Precision/mAP@.75IOU:
0.115219
INFO:tensorflow: + DetectionBoxes_Precision/mAP (small): 0.065785
I1202 00:31:14.746936 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Precision/mAP
(small): 0.065785
```

```

INFO:tensorflow: + DetectionBoxes_Precision/mAP (medium): 0.147513
I1202 00:31:14.747510 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Precision/mAP
(medium): 0.147513
INFO:tensorflow: + DetectionBoxes_Precision/mAP (large): 0.217017
I1202 00:31:14.748194 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Precision/mAP
(large): 0.217017
INFO:tensorflow: + DetectionBoxes_Recall/AR@1: 0.208071
I1202 00:31:14.748768 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Recall/AR@1: 0.208071
INFO:tensorflow: + DetectionBoxes_Recall/AR@10: 0.361643
I1202 00:31:14.749367 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Recall/AR@10:
0.361643
INFO:tensorflow: + DetectionBoxes_Recall/AR@100: 0.398246
I1202 00:31:14.749956 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Recall/AR@100:
0.398246
INFO:tensorflow: + DetectionBoxes_Recall/AR@100 (small): 0.252454
I1202 00:31:14.750520 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Recall/AR@100
(small): 0.252454
INFO:tensorflow: + DetectionBoxes_Recall/AR@100 (medium): 0.390290
I1202 00:31:14.751118 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Recall/AR@100
(medium): 0.390290
INFO:tensorflow: + DetectionBoxes_Recall/AR@100 (large): 0.450440
I1202 00:31:14.751914 139984855218048 model_lib_v2.py:957] + DetectionBoxes_Recall/AR@100
(large): 0.450440
INFO:tensorflow: + Loss/localization_loss: 0.334589
I1202 00:31:14.752436 139984855218048 model_lib_v2.py:957] + Loss/localization_loss: 0.334589
INFO:tensorflow: + Loss/classification_loss: 0.499788
I1202 00:31:14.752994 139984855218048 model_lib_v2.py:957] + Loss/classification_loss: 0.499788
INFO:tensorflow: + Loss/regularization_loss: 0.113321
I1202 00:31:14.753518 139984855218048 model_lib_v2.py:957] + Loss/regularization_loss: 0.113321
INFO:tensorflow: + Loss/total_loss: 0.947698
I1202 00:31:14.754071 139984855218048 model_lib_v2.py:957] + Loss/total_loss: 0.947698
INFO:tensorflow:Waiting for new checkpoint at
/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2
I1202 00:31:15.012368 139984855218048 checkpoint_utils.py:125] Waiting for new checkpoint at
/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/training_logs2
Traceback (most recent call last):
  File "/content/models/research/object_detection/model_main_tf2.py", line 113, in <module>
    tf.compat.v1.app.run()
  File "/usr/local/lib/python3.6/dist-packages/tensorflow/python/platform/app.py", line 40, in run
    _run(main=main, argv=argv, flags_parser=_parse_flags_tolerate_undef)
  File "/usr/local/lib/python3.6/dist-packages/absl/app.py", line 300, in run
    _run_main(main, args)
  File "/usr/local/lib/python3.6/dist-packages/absl/app.py", line 251, in _run_main
    sys.exit(main(argv))
  File "/content/models/research/object_detection/model_main_tf2.py", line 88, in main
    wait_interval=300, timeout=FLAGS.eval_timeout)
  File "/content/models/research/object_detection/model_lib_v2.py", line 1064, in
eval_continuously
    File "/usr/local/lib/python3.6/dist-packages/tensorflow/python/training/checkpoint_utils.py", li
ne 184, in checkpoints_iterator
    checkpoint_dir, checkpoint_path, timeout=timeout)
  File "/usr/local/lib/python3.6/dist-packages/tensorflow/python/training/checkpoint_utils.py", li
ne 132, in wait_for_new_checkpoint
    time.sleep(seconds_to_sleep)
KeyboardInterrupt

```

4. Inference

In []:

```

import os
os.environ['TF_CPP_MIN_LOG_LEVEL'] = '2'      # Suppress TensorFlow logging (1)
import pathlib
import tensorflow as tf

tf.get_logger().setLevel('ERROR')                 # Suppress TensorFlow logging (2)

import time
from object_detection.utils import label_map_util
from object_detection.utils import visualization_utils as viz_utils

PATH_TO_MODEL_DIR =
'/content/drive/MyDrive/object_detection/mobile_ner_v2_fpnlite_640x640/exporter2'

```

```

PATH_TO_SAVED_MODEL = PATH_TO_MODEL_DIR + "/saved_model"

print('Loading model...', end='')
start_time = time.time()

# Load saved model and build the detection function
detect_fn = tf.saved_model.load(PATH_TO_SAVED_MODEL)

end_time = time.time()
elapsed_time = end_time - start_time
print('Done! Took {} seconds'.format(elapsed_time))

```

Loading model...Done! Took 15.877567768096924 seconds

In []:

```

import imutils
from object_detection.utils import ops as utils_ops
utils_ops.tf = tf.compat.v1
tf.gfile = tf.io.gfile
PATH_TO_LABELS = '/content/content/data/label_map.pbtxt'

category_index = label_map_util.create_category_index_from_labelmap(PATH_TO_LABELS,
                                                               use_display_name=True)

```

In []:

```

import glob
PATH_TO_TEST_IMAGES_DIR = '/content/content/data/Images/test_images'

TEST_IMAGE_PATHS = glob.glob(os.path.join(PATH_TO_TEST_IMAGES_DIR, "*.*"))
TEST_IMAGE_PATHS[0:5]

```

Out[]:

```

['/content/content/data/Images/test_images/Japan_007564.jpg',
 '/content/content/data/Images/test_images/India_002576.jpg',
 '/content/content/data/Images/test_images/Japan_009929.jpg',
 '/content/content/data/Images/test_images/Japan_002202.jpg',
 '/content/content/data/Images/test_images/India_001485.jpg']

```

In []:

```

import numpy as np
from PIL import Image
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')

def load_image_into_numpy_array(path):
    """Load an image from file into a numpy array.

    Puts image into numpy array to feed into tensorflow graph.
    Note that by convention we put it into a numpy array with shape
    (height, width, channels), where channels=3 for RGB.

    Args:
        path: the file path to the image

    Returns:
        uint8 numpy array with shape (img_height, img_width, 3)
    """
    return np.array(Image.open(path))

```

In []:

```

for image_path in TEST_IMAGE_PATHS[0:15]:
    print('Running inference for {}... '.format(image_path), end='')

    image_np = load_image_into_numpy_array(image_path)
    #image_np = image_np[:, :, ::-1]

```

```

print(image_np.shape)
# Things to try:
# Flip horizontally
# image_np = np.fliplr(image_np).copy()

# Convert image to grayscale
# image_np = np.tile(
#     np.mean(image_np, 2, keepdims=True), (1, 1, 3)).astype(np.uint8)

# The input needs to be a tensor, convert it using `tf.convert_to_tensor`.
input_tensor = tf.convert_to_tensor(image_np)
# The model expects a batch of images, so add an axis with `tf.newaxis`.
#print(input_tensor.shape)
input_tensor = input_tensor[tf.newaxis, ...]
#print(input_tensor.shape)
# input_tensor = np.expand_dims(image_np, 0)
detections = detect_fn(input_tensor)
#print(detections)
# All outputs are batches tensors.
# Convert to numpy arrays, and take index [0] to remove the batch dimension.
# We're only interested in the first num_detections.
num_detections = int(detections.pop('num_detections'))
detections = {key: value[0, :num_detections].numpy()
               for key, value in detections.items()}
detections['num_detections'] = num_detections
detections['detection_classes'] = detections['detection_classes'].astype(np.int64)

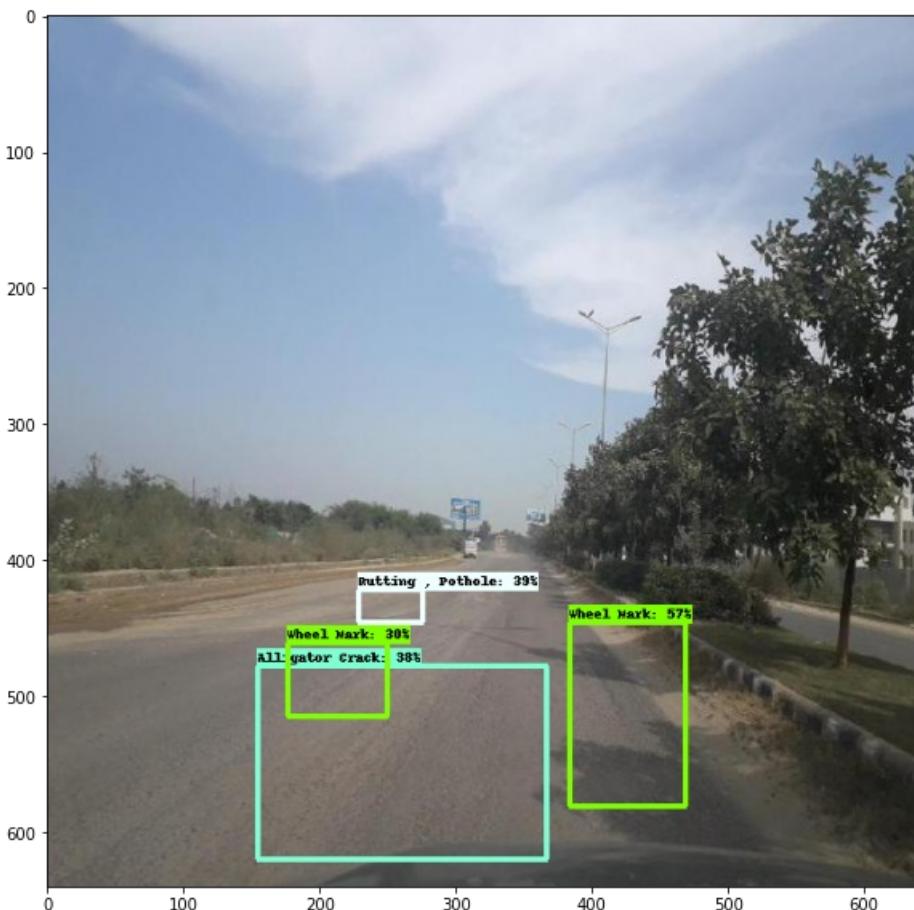
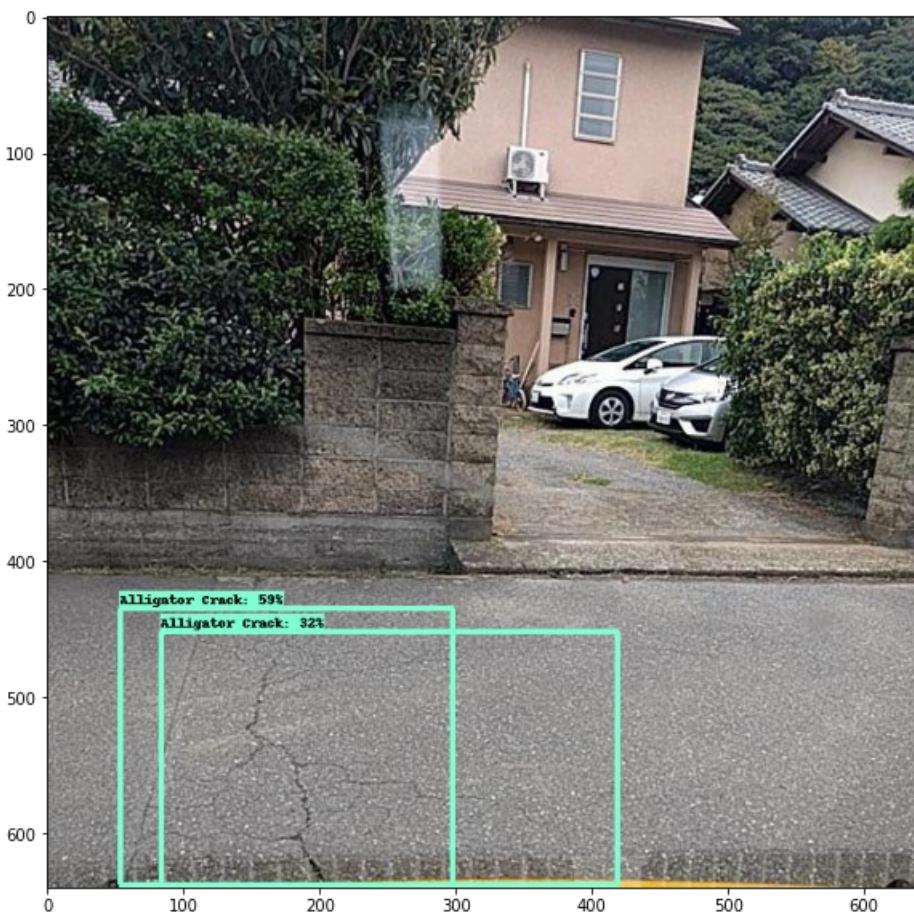
image_np_with_detections = image_np.copy()

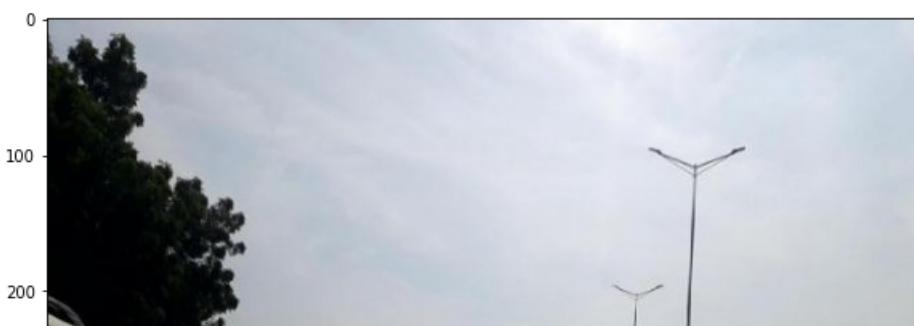
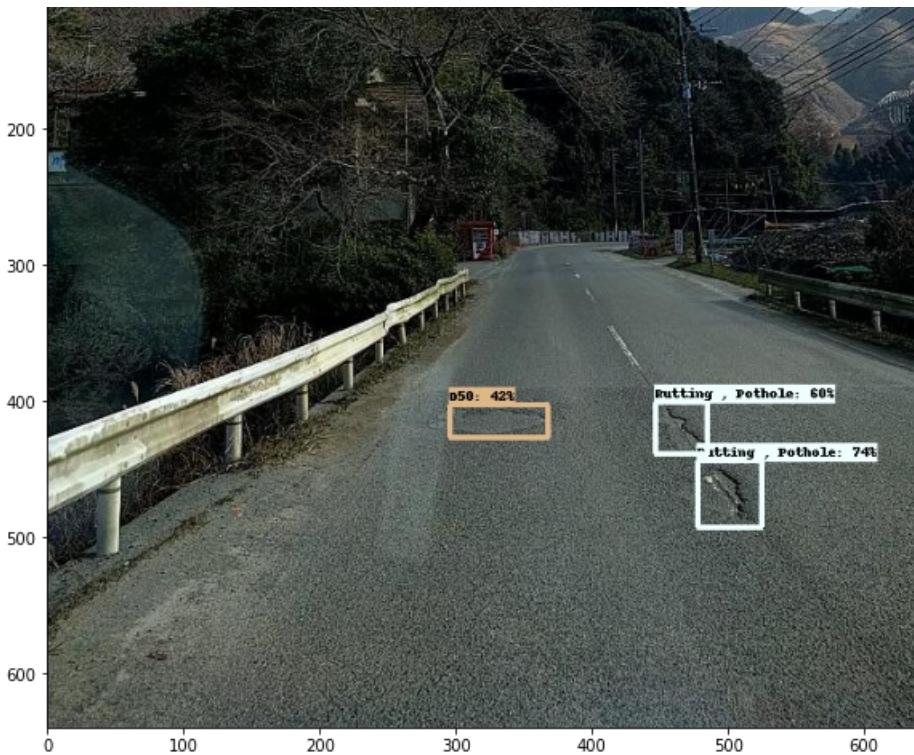
viz_utils.visualize_boxes_and_labels_on_image_array(
    image_np_with_detections,
    detections['detection_boxes'],
    detections['detection_classes'],
    detections['detection_scores'],
    category_index,
    use_normalized_coordinates=True,
    max_boxes_to_draw=200,
    min_score_thresh=.30,
    agnostic_mode=False)

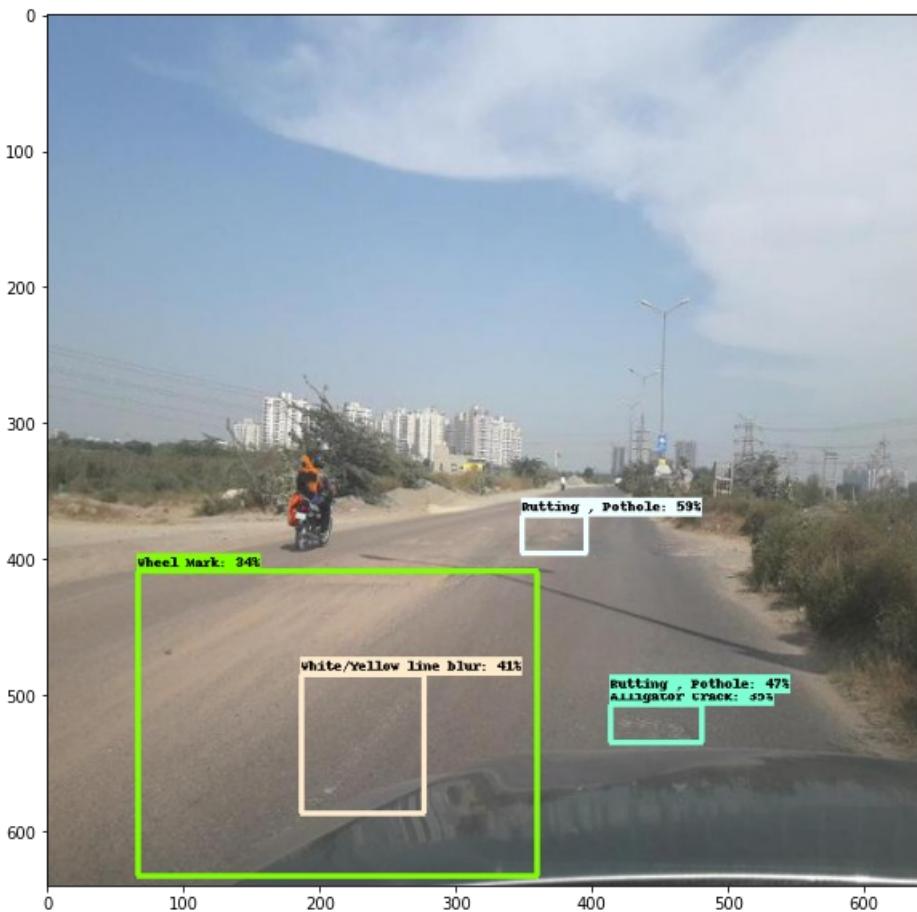
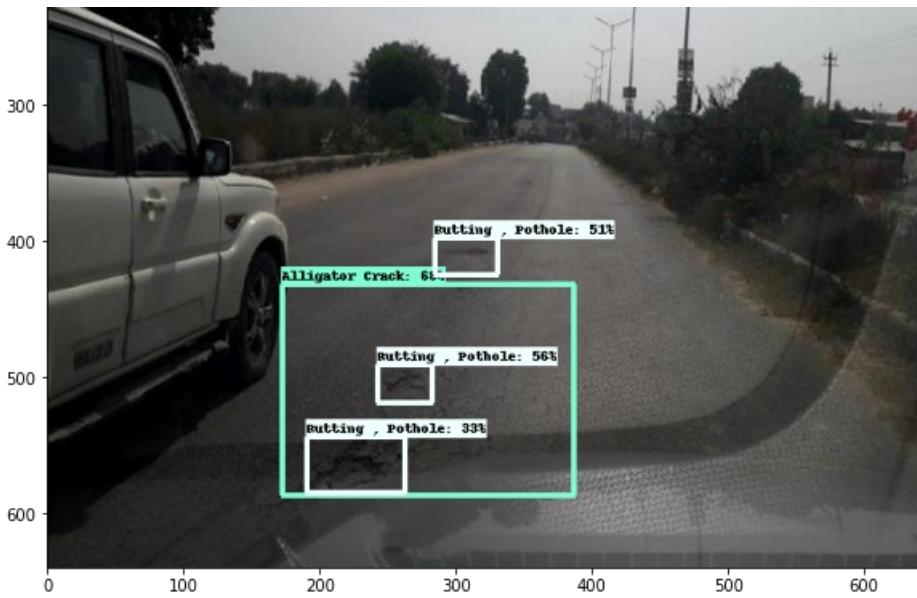
plt.figure(figsize=(10,10))
plt.imshow(image_np_with_detections)
print('Done')
plt.show()

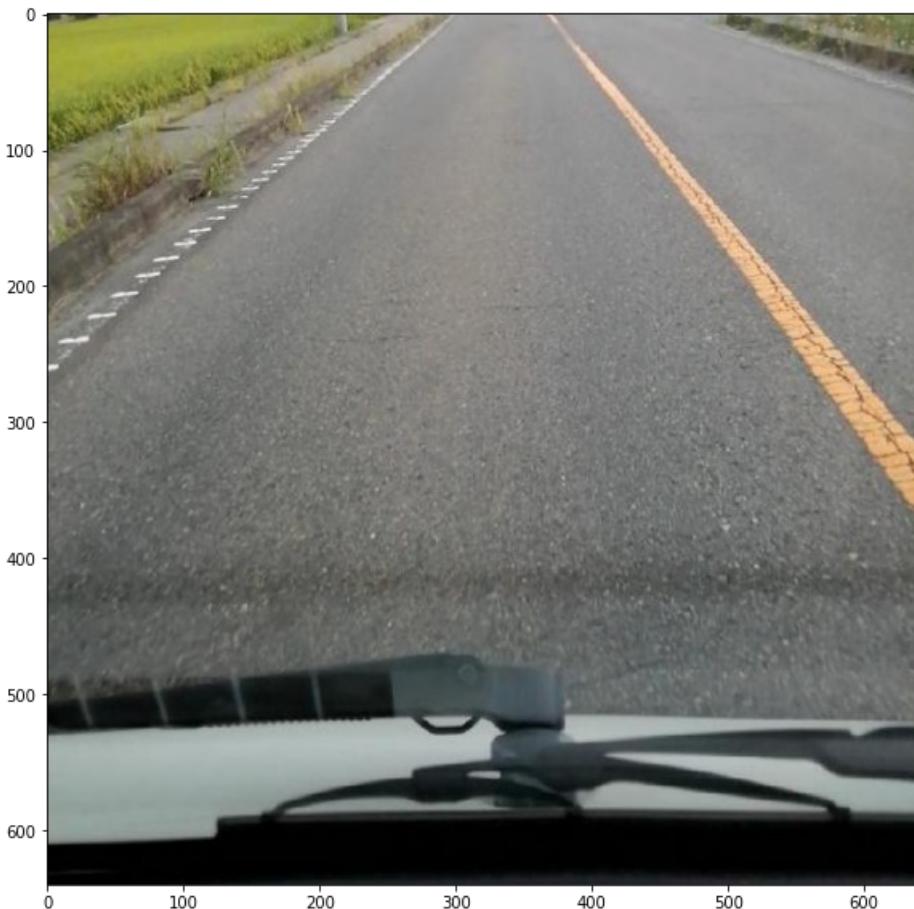
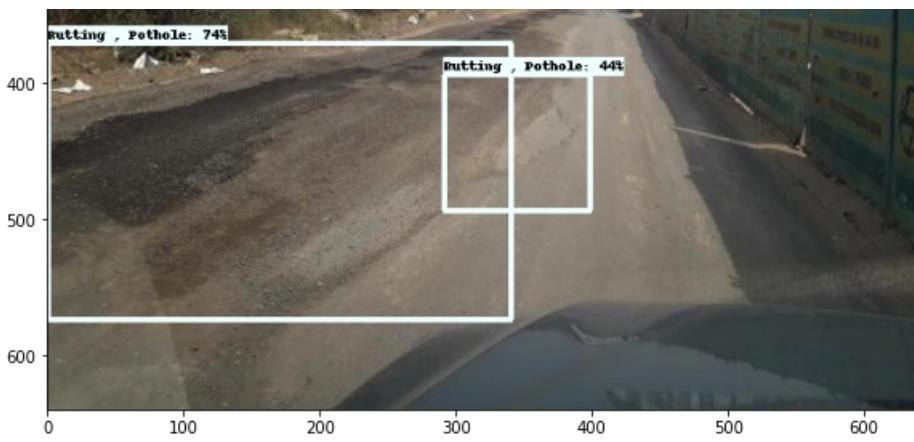
```

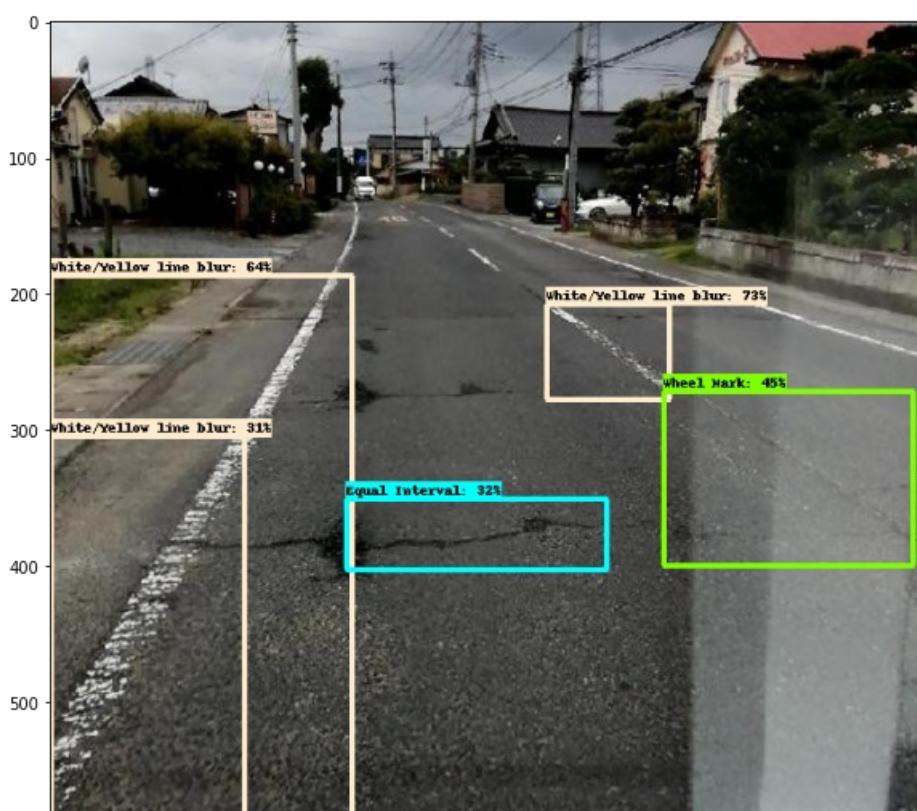
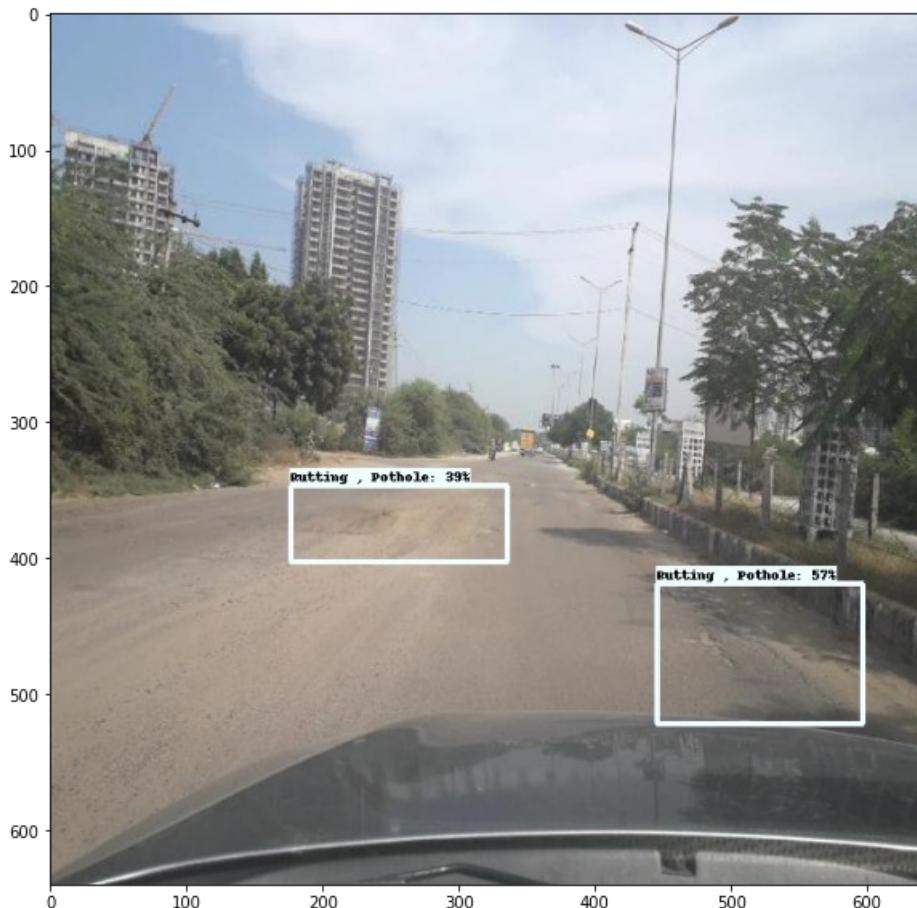
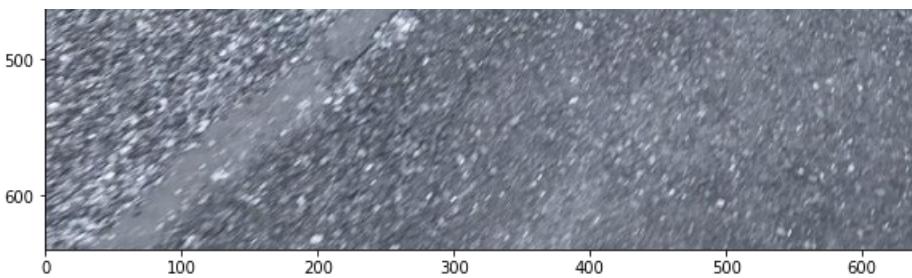
Running inference for /content/content/data/Images/test_images/Japan_007564.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/India_002576.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/Japan_009929.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/Japan_002202.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/India_001485.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/India_009794.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/India_007572.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/Japan_010712.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/Japan_007648.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/India_003152.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/Japan_008391.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/India_008802.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/India_003153.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/Japan_012295.jpg... (640, 640, 3)
Done
Running inference for /content/content/data/Images/test_images/India_001884.jpg... (640, 640, 3)
Done

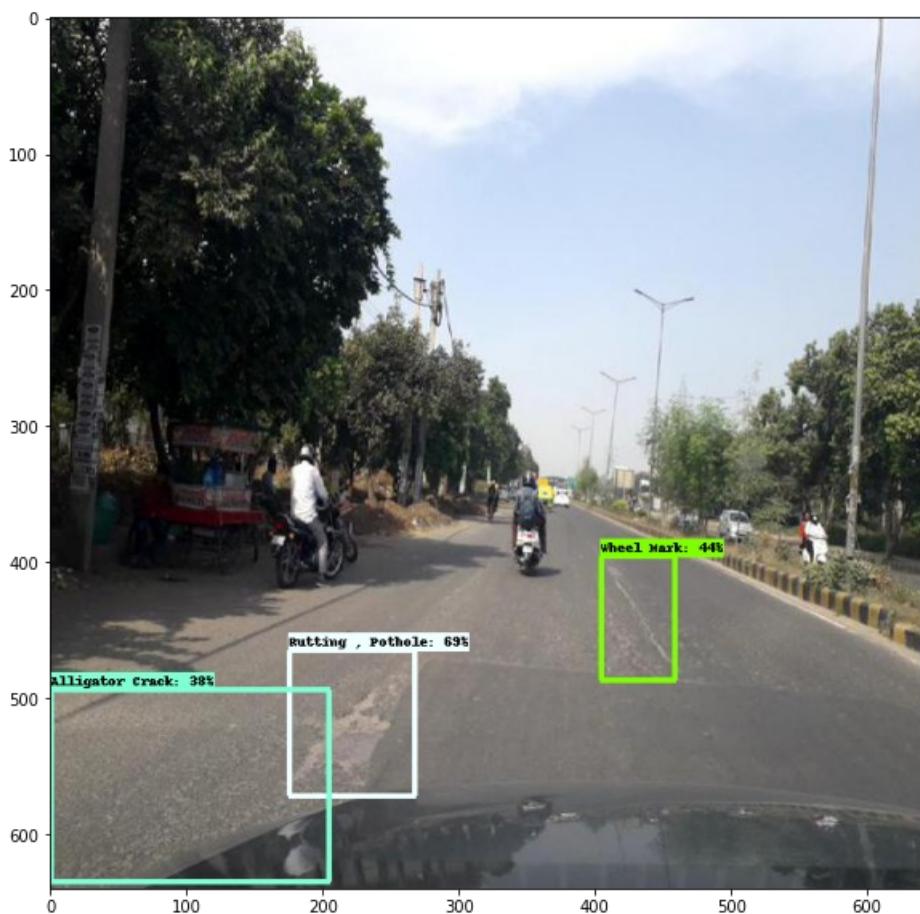
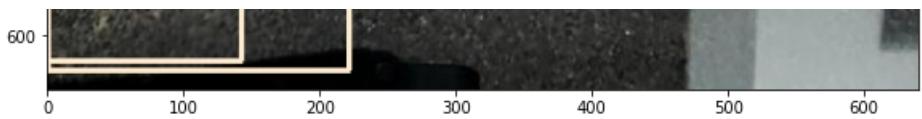


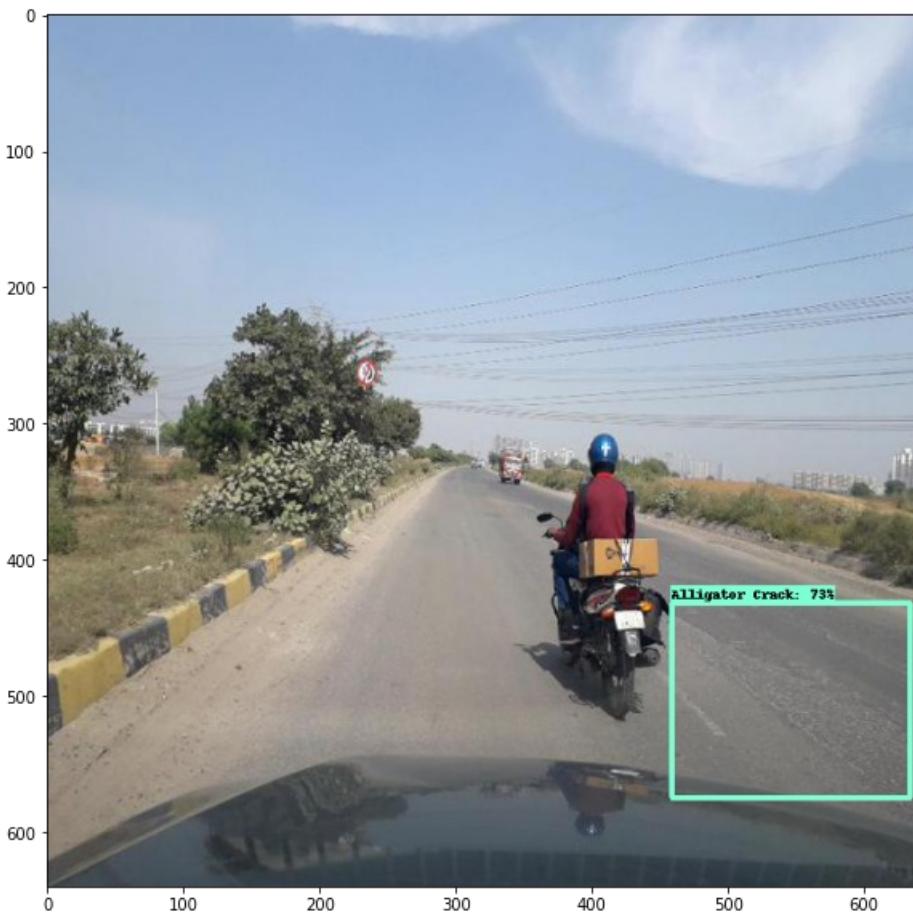
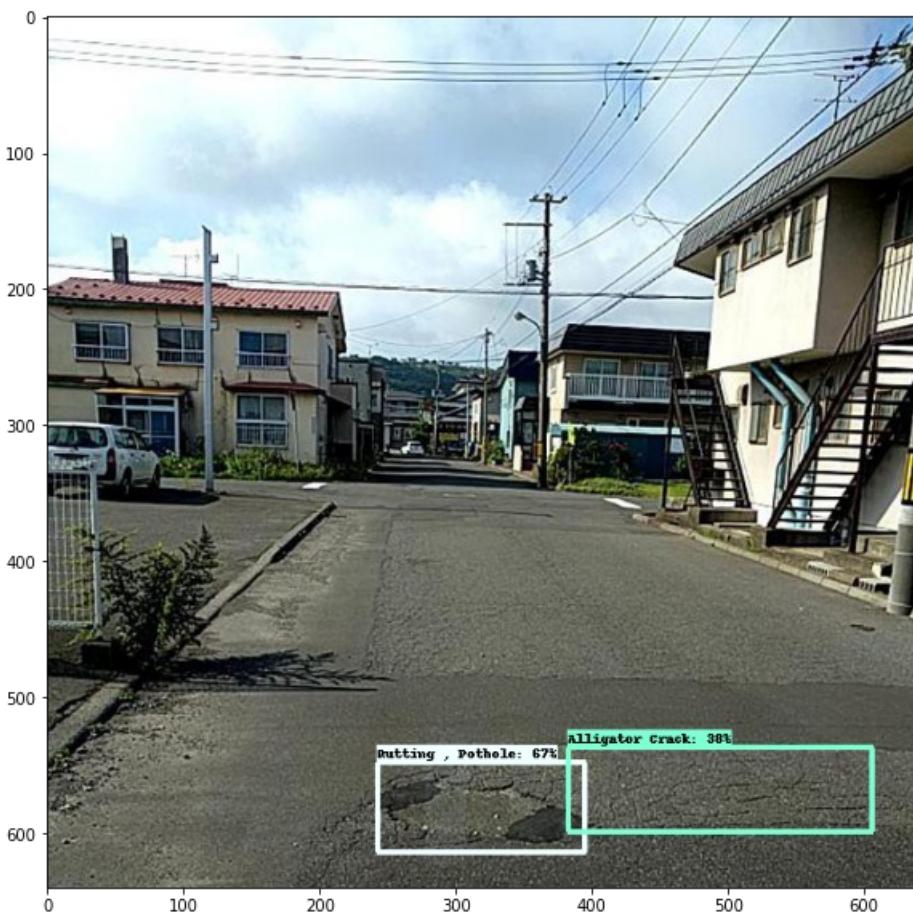












In []:

```
resized_test_images_df = pd.read_csv('/content/content/data/label_csv/test_resized_label.csv')
grouped_resized = resized_test_images_df.groupby('filename')
```

In []:

```
for image_path in TEST_IMAGE_PATHS[0:25]:
    fig, cell = plt.subplots(1, 2, figsize=(20,20))
    print('Running inference for {}... '.format(image_path), end='')

    image_np = load_image_into_numpy_array(image_path)
    print(image_np.shape)
    # Things to try:
    # Flip horizontally
    # image_np = np.fliplr(image_np).copy()

    # Convert image to grayscale
    # image_np = np.tile(
    #     np.mean(image_np, 2, keepdims=True), (1, 1, 3)).astype(np.uint8)

    # The input needs to be a tensor, convert it using `tf.convert_to_tensor`.
    input_tensor = tf.convert_to_tensor(image_np)
    # The model expects a batch of images, so add an axis with `tf.newaxis`.
    #print(input_tensor.shape)
    input_tensor = input_tensor[tf.newaxis, ...]
    #print(input_tensor.shape)
    # input_tensor = np.expand_dims(image_np, 0)
    detections = detect_fn(input_tensor)
    #print(detections)
    # All outputs are batches tensors.
    # Convert to numpy arrays, and take index [0] to remove the batch dimension.
    # We're only interested in the first num_detections.
    num_detections = int(detections.pop('num_detections'))
    detections = {key: value[0, :num_detections].numpy()
                  for key, value in detections.items()}
    detections['num_detections'] = num_detections
    detections['detection_classes'] = detections['detection_classes'].astype(np.int64)

    image_np_with_detections = image_np.copy()

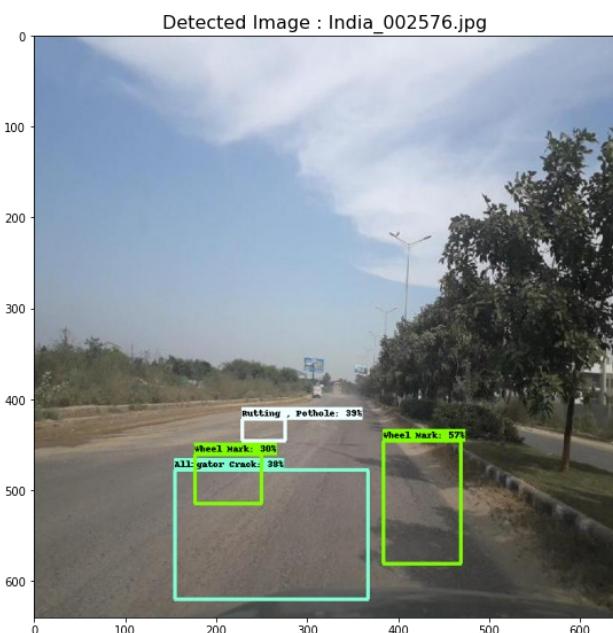
    viz_utils.visualize_boxes_and_labels_on_image_array(
        image_np_with_detections,
        detections['detection_boxes'],
        detections['detection_classes'],
        detections['detection_scores'],
        category_index,
        use_normalized_coordinates=True,
        max_boxes_to_draw=200,
        min_score_thresh=.3,
        agnostic_mode=False)
    cell[0].set_title('Detected Image : {}'.format(image_path.split('/')[-1]), fontsize = 16)
    cell[0].imshow(image_np_with_detections)
    #print('Done')

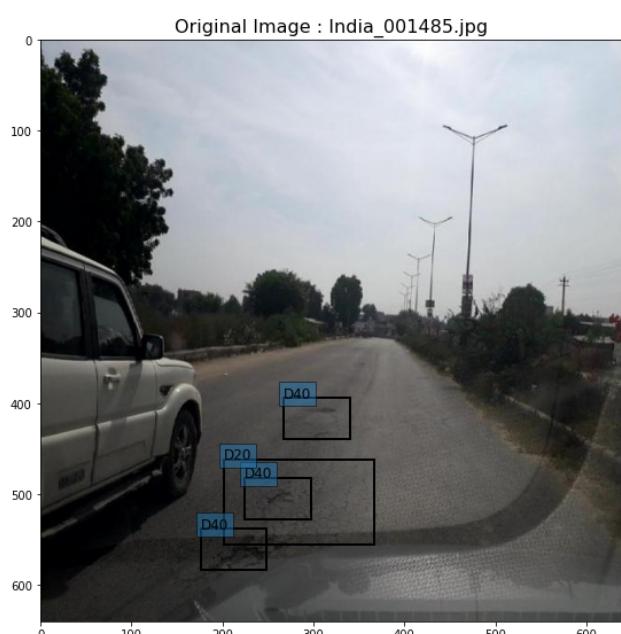
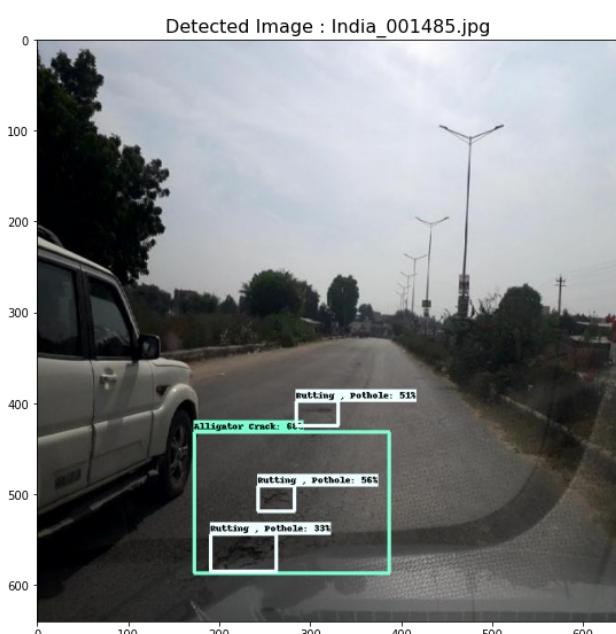
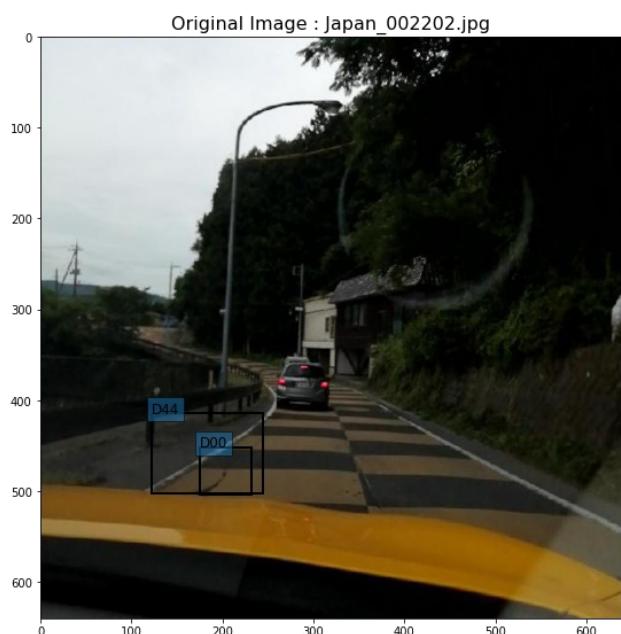
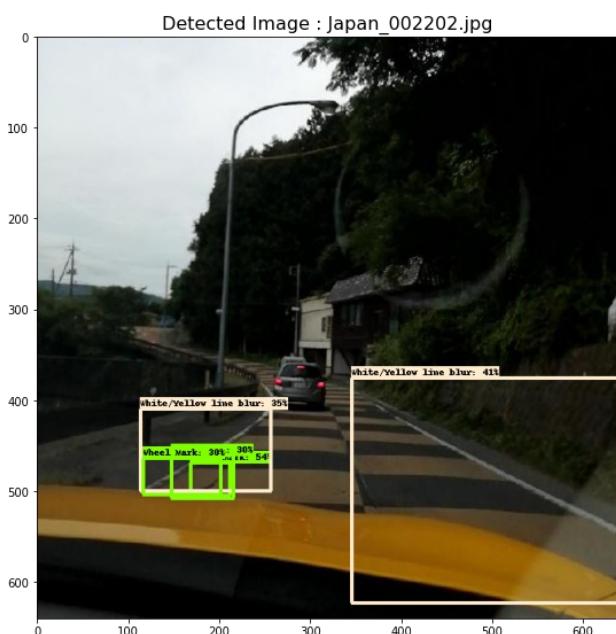
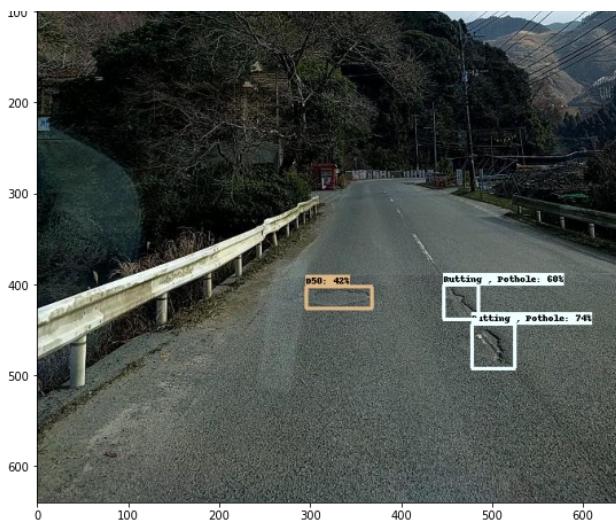
    group_r_df = grouped_resized.get_group(image_path.split('/')[-1])
    group_r_df = group_r_df.reset_index()
    group_r_df = group_r_df.drop(['index'], axis=1)
    bb_r_array = group_r_df.drop(['filename', 'width', 'height'], axis=1).values
    resized_img = imageio.imread(image_path)
    img_array1 = np.asarray(resized_img)
    cell[1].imshow(img_array1)
    #bbs_r = BoundingBoxesOnImage.from_xyxy_array(bb_r_array, shape=resized_img.shape)
    #print(bb_r_array)
    for box in bb_r_array:
        xmin = box[1]
        ymin = box[2]
        xmax = box[3]
        ymax = box[4]
        # color = colors[int(box[0])]
        label = '{}'.format(box[0])
        cell[1].set_title('Original Image : {}'.format(image_path.split('/')[-1]), fontsize = 16)
        cell[1].add_patch(plt.Rectangle((xmin, ymin), xmax-xmin, ymax-ymin, fill=False, linewidth=2))

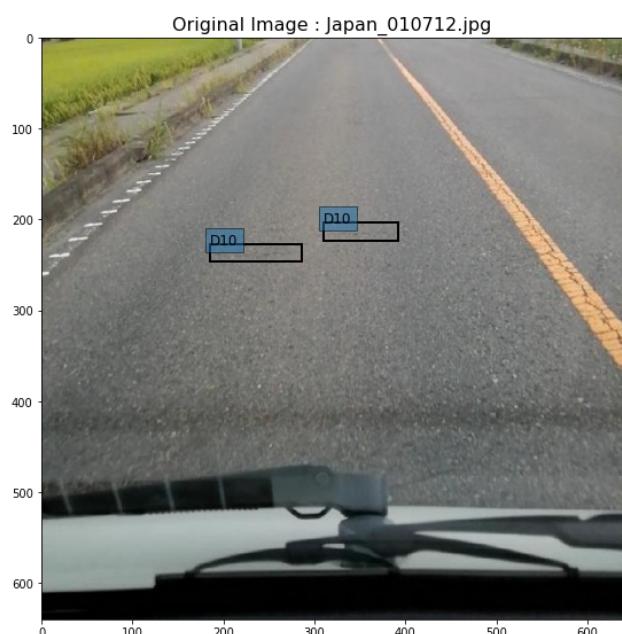
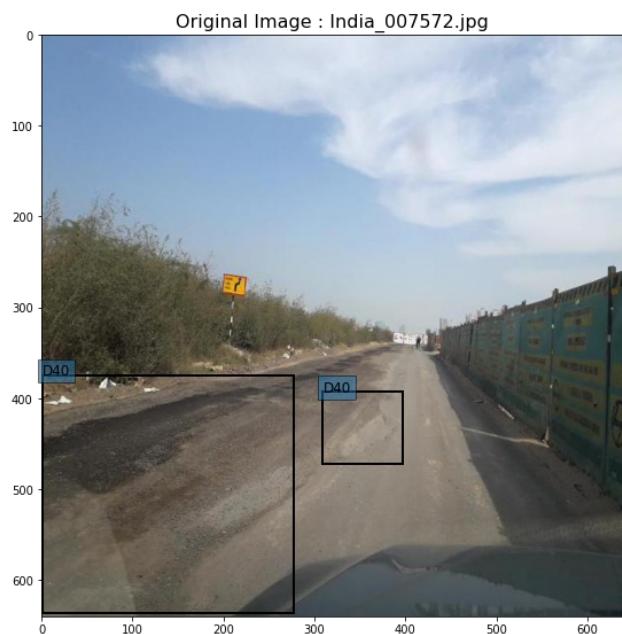
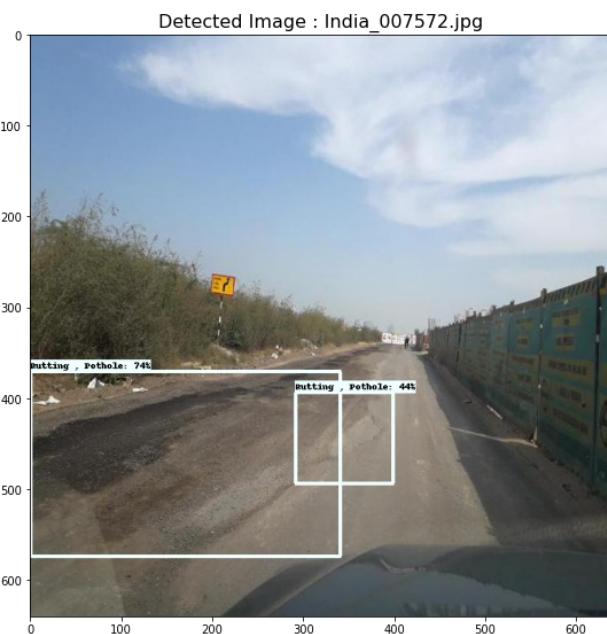
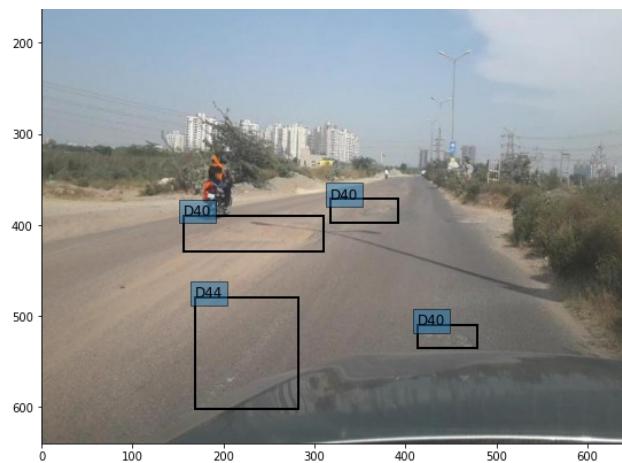
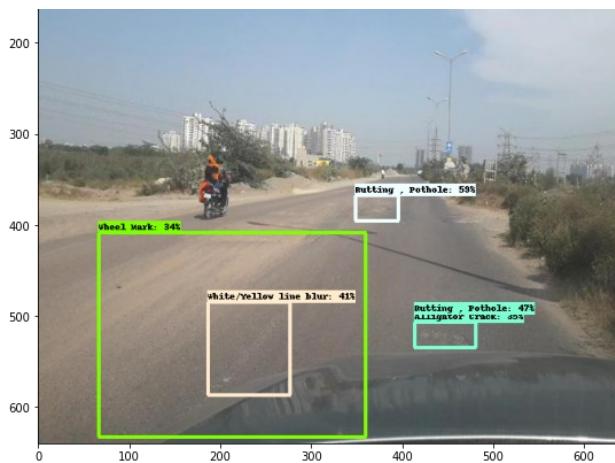
        cell[1].text(xmin, ymin, label, size='large', color='black', bbox={'alpha':0.5})
plt.show()
```

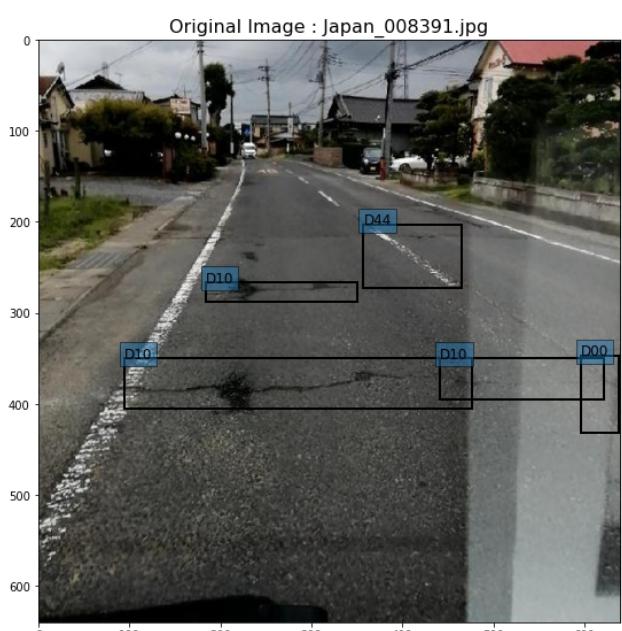
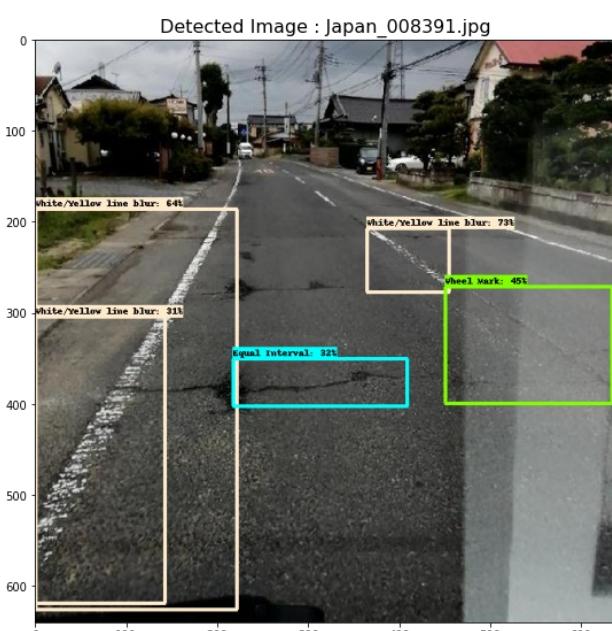
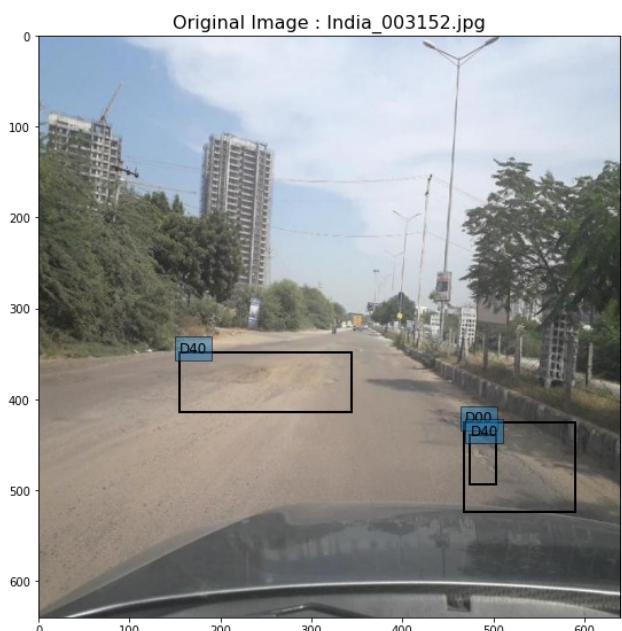
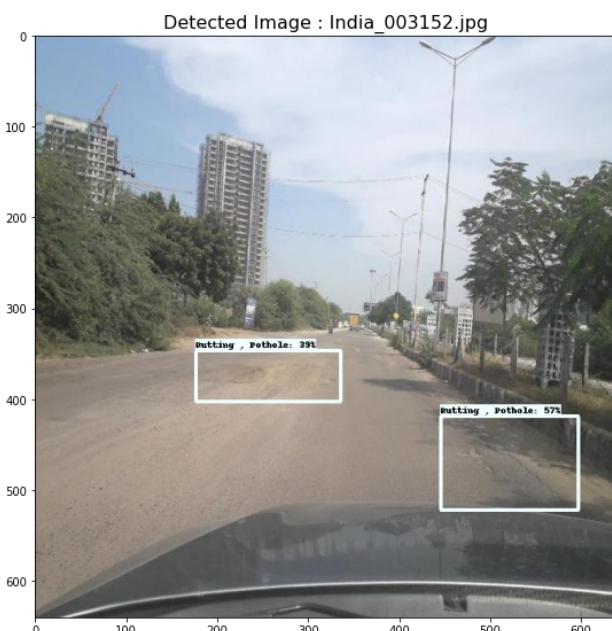
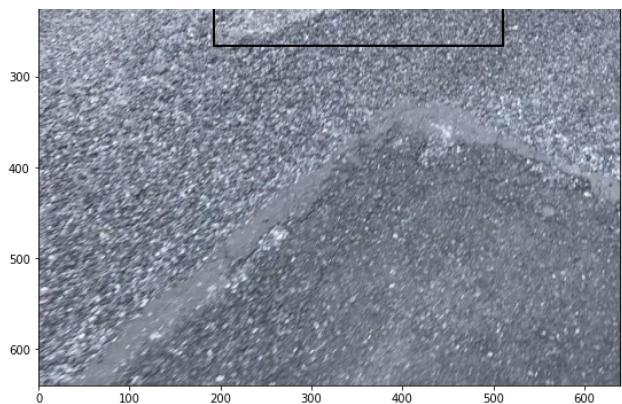
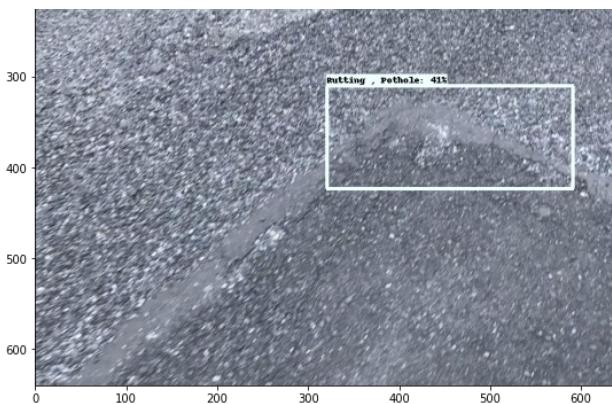
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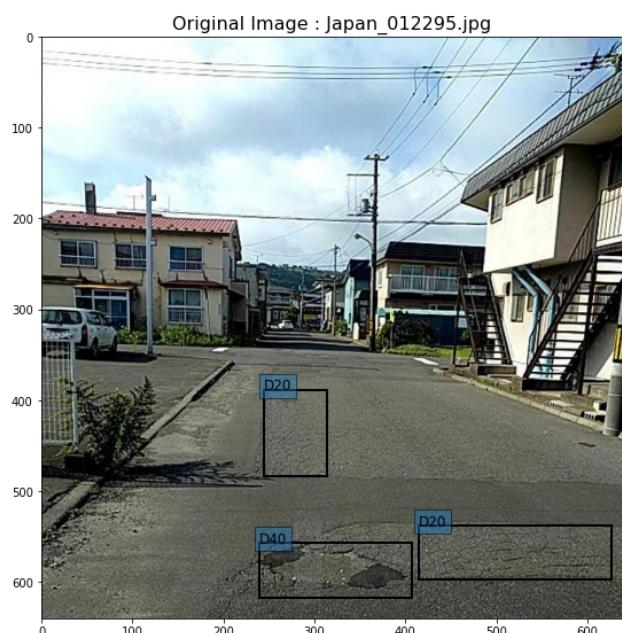
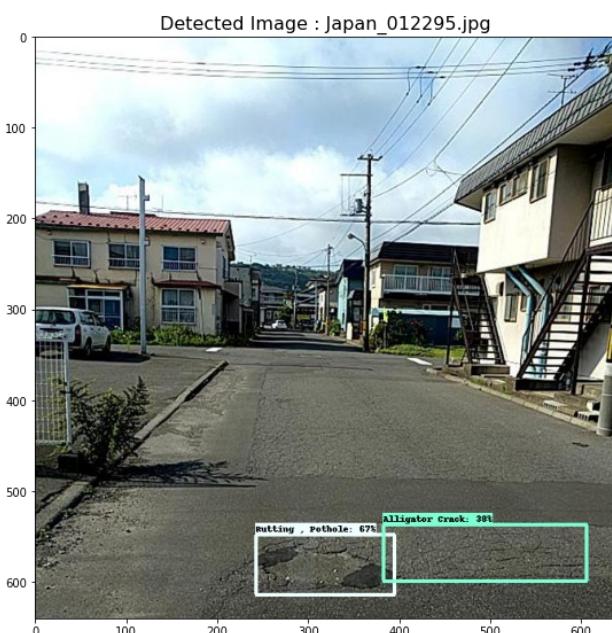
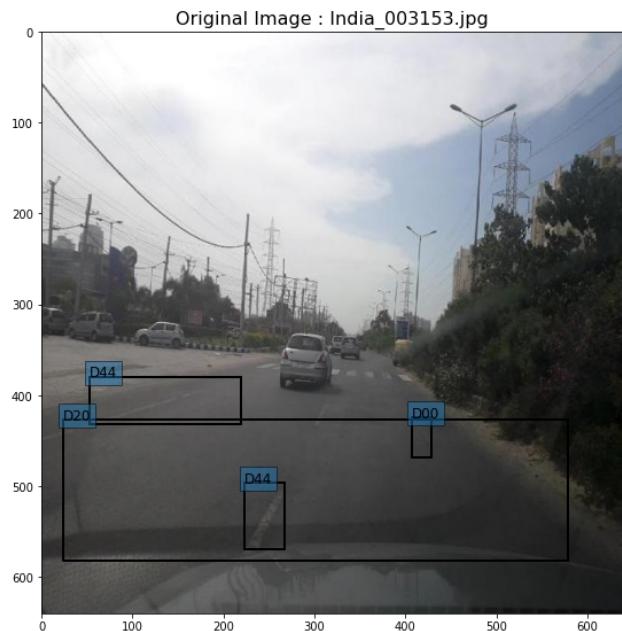
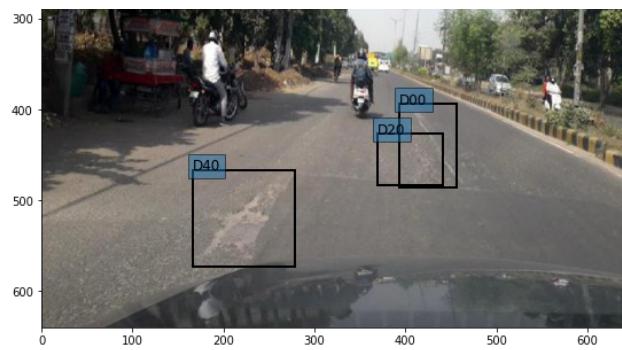
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Running inference for /content/content/data/Images/test_images/Czech_002165.jpg... (640, 640, 3)
Running inference for /content/content/data/Images/test_images/Japan_012017.jpg... (640, 640, 3)
Running inference for /content/content/data/Images/test_images/India_009048.jpg... (640, 640, 3)
Running inference for /content/content/data/Images/test_images/India_008263.jpg... (640, 640, 3)
Running inference for /content/content/data/Images/test_images/India_006098.jpg... (640, 640, 3)
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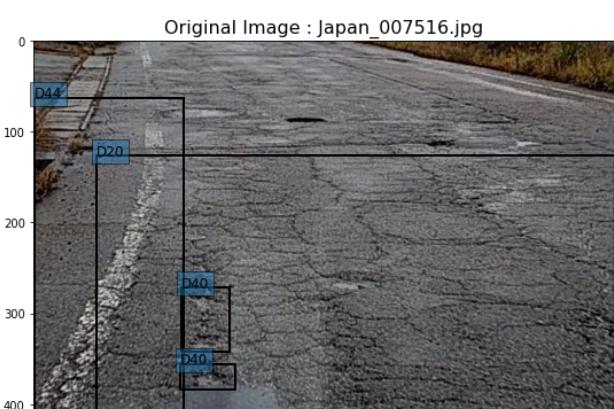
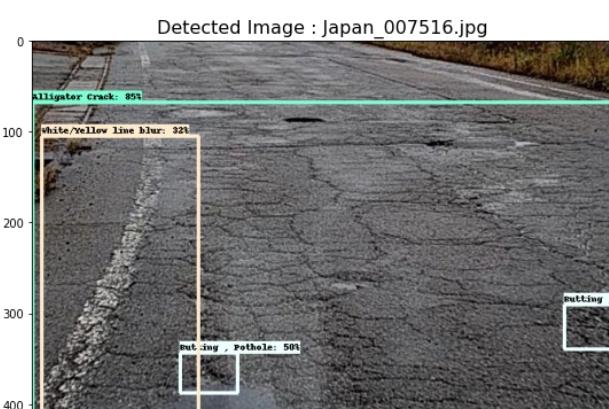
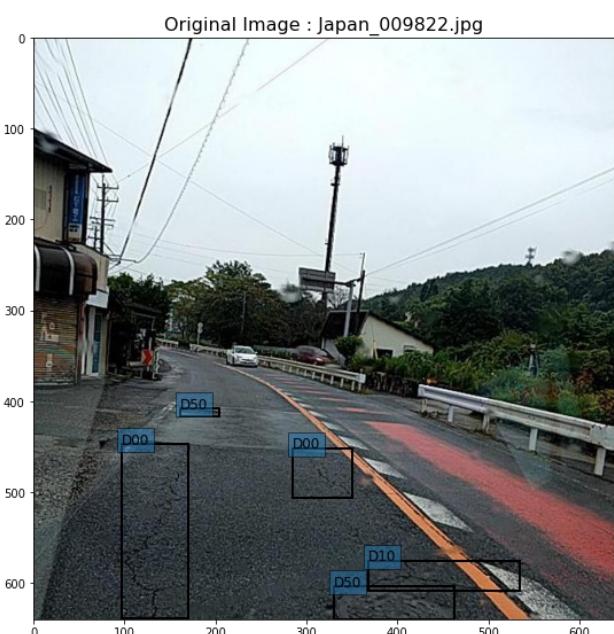
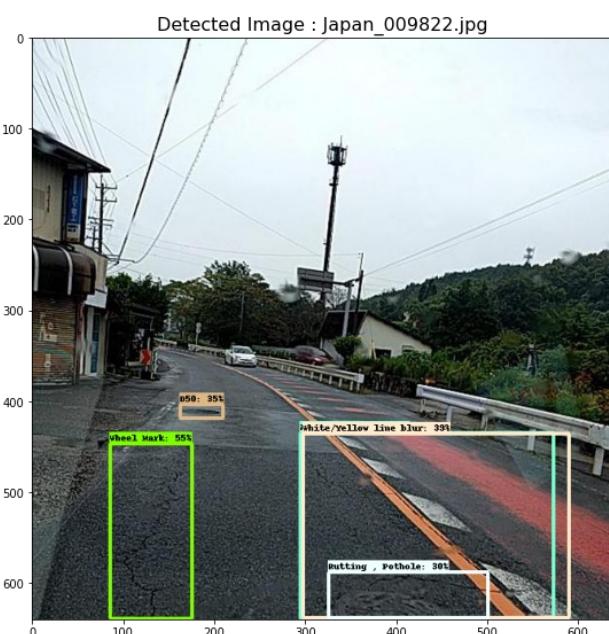
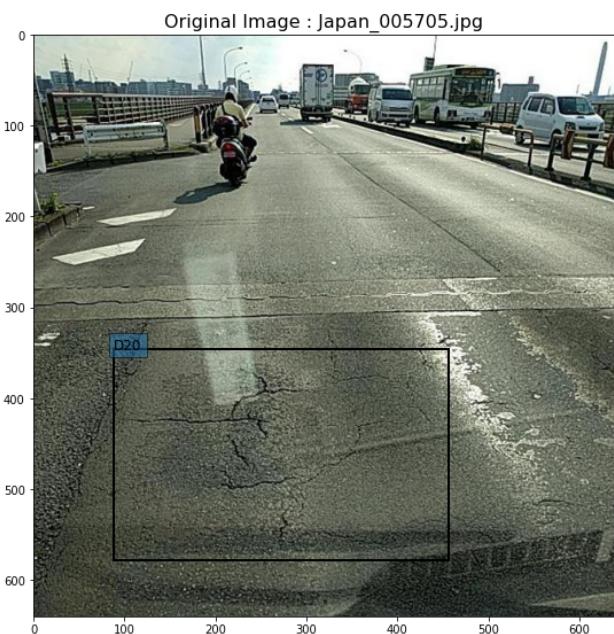
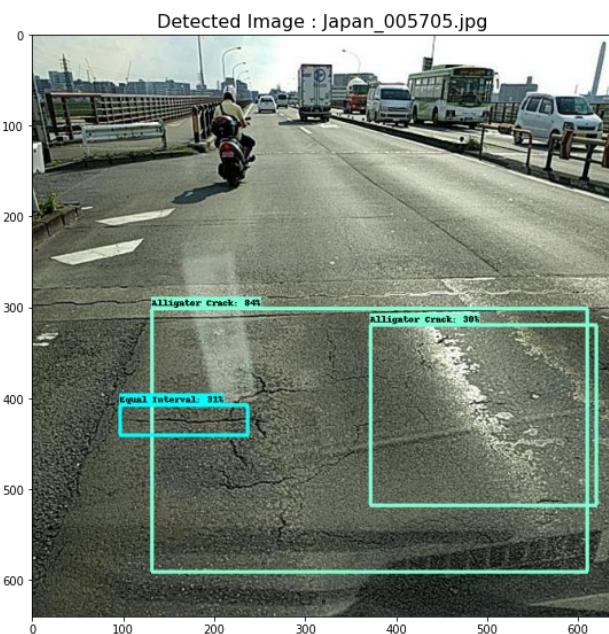


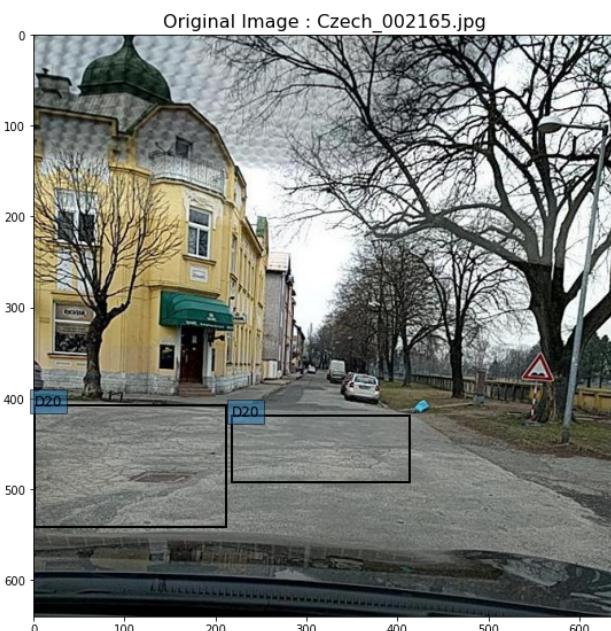
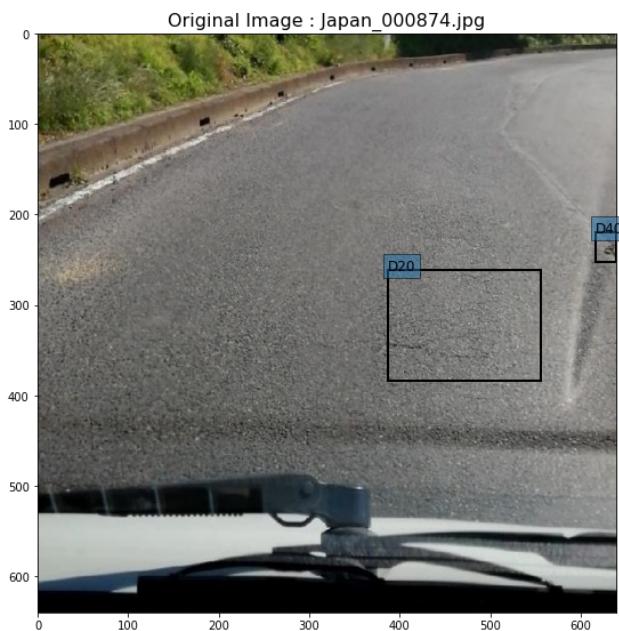
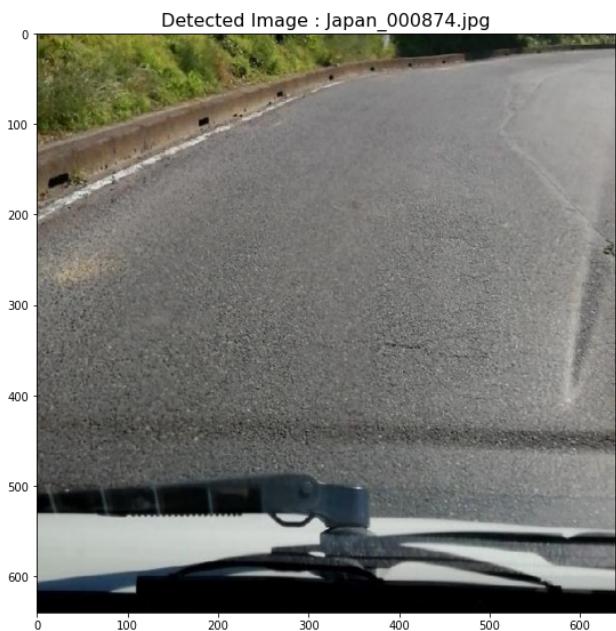
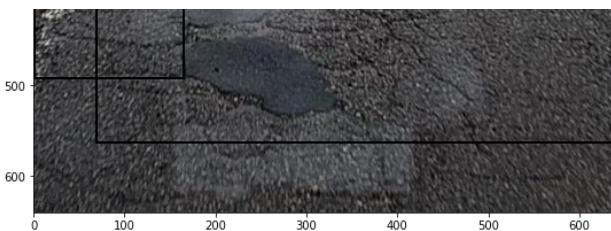
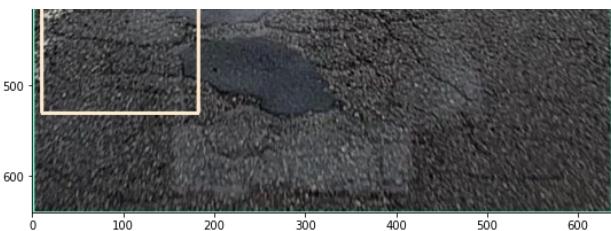


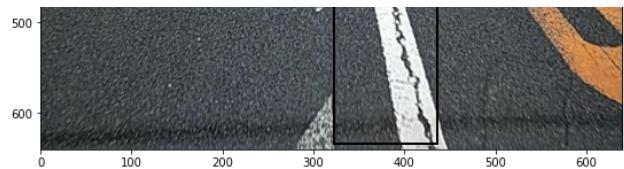
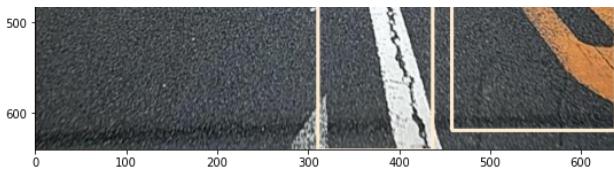




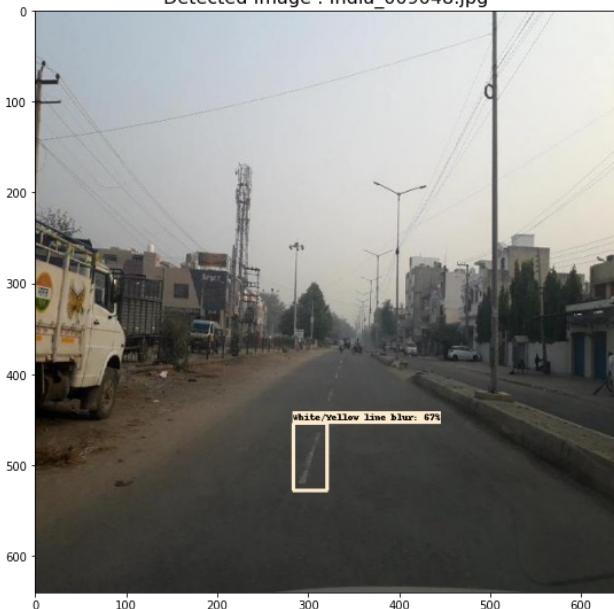




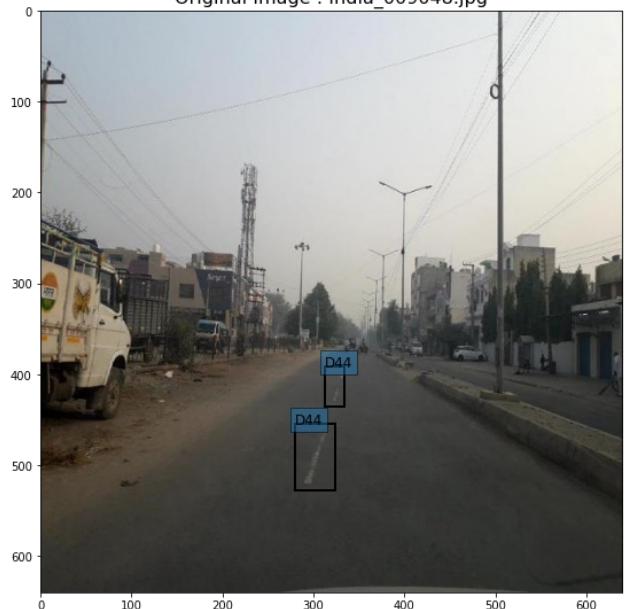




Detected Image : India_009048.jpg



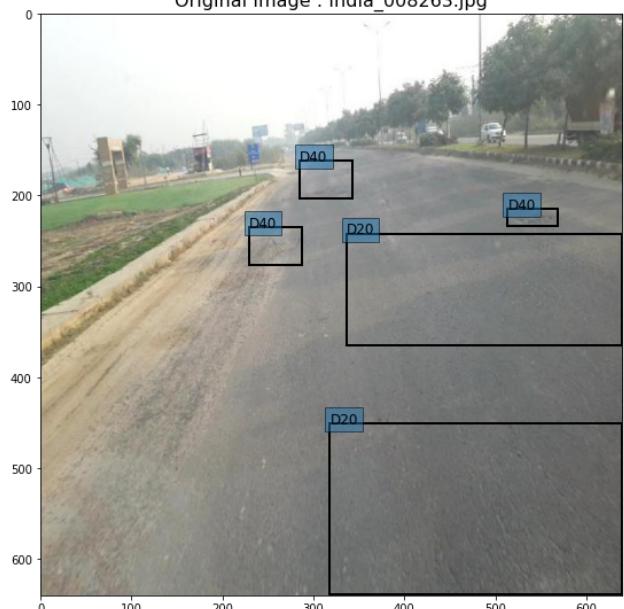
Original Image : India_009048.jpg



Detected Image : India_008263.jpg



Original Image : India_008263.jpg

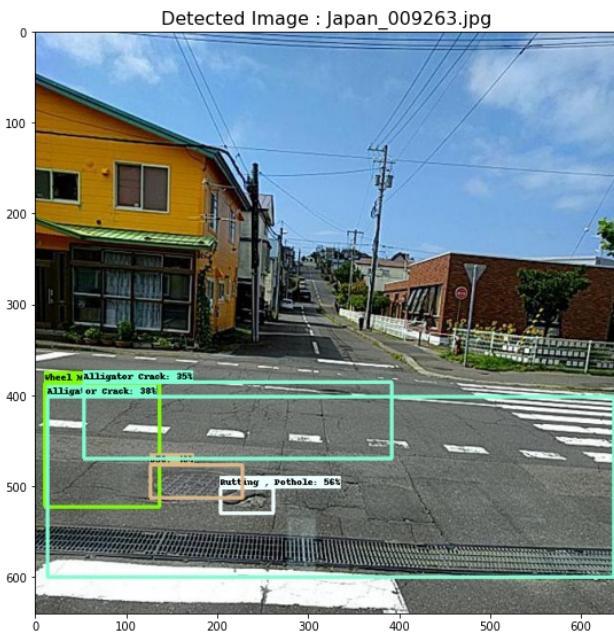
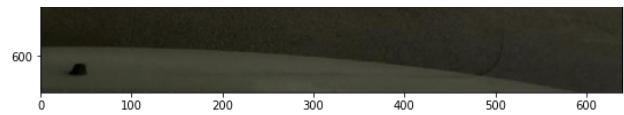


Detected Image : India_006098.jpg



Original Image : India_006098.jpg





As from evaluation we can see we got total loss 0.947698.Which high compare to Faster RCNN which was train upto 25k iterations (steps).

SSD_mobilnet is faster compare to Faster RCNN model but not able to minimize the loss even after 60k steps.In Faster RCNN we get total loss 0.69 after 25k steps.