

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

Mounted at /content/drive

```
cd /content/drive/MyDrive/1.Deep_Learning
```

/content/drive/MyDrive/1.Deep\_Learning

```
ls
```

1.TFOD/ 2.TFOD2/ training\_demo/ training\_demo.zip Untitled

```
!unzip training_demo.zip
```

[https://colab.research.google.com/github/sayakpaul/TF-2.0-Hacks/blob/master/Training\\_a\\_pets\\_detector\\_model\\_within\\_minutes\\_with\\_TFOD\\_API.ipynb#scrollTo=loO\\_t54Kegno](https://colab.research.google.com/github/sayakpaul/TF-2.0-Hacks/blob/master/Training_a_pets_detector_model_within_minutes_with_TFOD_API.ipynb#scrollTo=loO_t54Kegno)

```
import tensorflow as tf
print(tf.__version__)
```

2.8.0

```
cd /content/drive/MyDrive/1.Deep_Learning/training_demo
```

/content/drive/MyDrive/1.Deep\_Learning/training\_demo

```
!git clone https://github.com/tensorflow/models.git
```

fatal: destination path 'models' already exists and is not an empty directory.

```
%cd models/research
```

```
/content/drive/MyDrive/1.Deep_Learning/training_demo/models/research
```

```
# Compile protos.
```

```
!protoc object_detection/protos/*.proto --python_out=.
```

```
# Install TensorFlow Object Detection API.
```

```
!cp object_detection/packages/tf2/setup.py .
```

```
!python -m pip install .
```

```

    downloading portalocker-2.4.0-py2.py3-none-any.whl (16 KB)
Requirement already satisfied: tabulate>=0.8.9 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: scikit-learn>=0.21.3 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: joblib>=0.11 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: typeguard>=2.7 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: future in /usr/local/lib/python3.7/dist-packages (from
Requirement already satisfied: promise in /usr/local/lib/python3.7/dist-packages (from
Requirement already satisfied: importlib-resources in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: attrs>=18.1.0 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: tensorflow-metadata in /usr/local/lib/python3.7/dist-packages
Building wheels for collected packages: object-detection, py-cpuinfo, dill, avro-python3
  Building wheel for object-detection (setup.py) ... done
  Created wheel for object-detection: filename=object_detection-0.1-py3-none-any.whl
  Stored in directory: /tmp/pip-ephem-wheel-cache-u626h2l5/wheels/3c/1f/43/035ce827cc
  Building wheel for py-cpuinfo (setup.py) ... done
  Created wheel for py-cpuinfo: filename=py_cpuinfo-8.0.0-py3-none-any.whl size=22257
  Stored in directory: /root/.cache/pip/wheels/d2/f1/1f/041add21dc9c4220157f1bd2bd6af
  Building wheel for dill (setup.py) ... done
  Created wheel for dill: filename=dill-0.3.1.1-py3-none-any.whl size=78544 sha256=e4
  Stored in directory: /root/.cache/pip/wheels/a4/61/fd/c57e374e580aa78a45ed78d5859b3
  Building wheel for avro-python3 (setup.py) ... done
  Created wheel for avro-python3: filename=avro_python3-1.10.2-py3-none-any.whl size=
  Stored in directory: /root/.cache/pip/wheels/d6/e5/b1/6b151d9b535ee50aaa6ab27d145a0
  Building wheel for sequeval (setup.py) ... done
  Created wheel for sequeval: filename=sequeval-1.2.2-py3-none-any.whl size=16180 sha25
  Stored in directory: /root/.cache/pip/wheels/05/96/ee/7cac4e74f3b19e3158dce26a20a1c
Successfully built object-detection py-cpuinfo dill avro-python3 sequeval
Installing collected packages: requests, protobuf, tf-estimator-nightly, portalocker,
  Attempting uninstall: requests
    Found existing installation: requests 2.23.0
    Uninstalling requests-2.23.0:
      Successfully uninstalled requests-2.23.0
  Attempting uninstall: protobuf
    Found existing installation: protobuf 3.17.3
    Uninstalling protobuf-3.17.3:
      Successfully uninstalled protobuf-3.17.3
  Attempting uninstall: dill
    Found existing installation: dill 0.3.4
    Uninstalling dill-0.3.4:
      Successfully uninstalled dill-0.3.4
  Attempting uninstall: pyyaml
    Found existing installation: PyYAML 3.13
    Uninstalling PyYAML 3.13:

```

```

Uninstalling PyYAML-3.13.
Successfully uninstalled PyYAML-3.13
Attempting uninstall: pymongo
Found existing installation: pymongo 4.1.0
Uninstalling pymongo-4.1.0:
Successfully uninstalled pymongo-4.1.0
Attempting uninstall: cloudpickle
Found existing installation: cloudpickle 1.3.0
Uninstalling cloudpickle-1.3.0:
Successfully uninstalled cloudpickle-1.3.0
ERROR: pip's dependency resolver does not currently take into account all the package
multiprocess 0.70.12.2 requires dill>=0.3.4, but you have dill 0.3.1.1 which is incom
gym 0.17.3 requires cloudpickle<1.7.0,>=1.2.0, but you have cloudpickle 2.0.0 which i
google-colab 1.0.0 requires requests~2.23.0, but you have requests 2.27.1 which is i
datascience 0.10.6 requires folium==0.2.1, but you have folium 0.8.3 which is incompa

```

```
cd /models/research
```

```
[Errno 2] No such file or directory: '/models/research'
/content/drive/MyDrive/1.Deep_Learning/training_demo/models/research
```

```
pwd
```

```
'/content/drive/MyDrive/1.Deep_Learning/training_demo/models/research'
```

```
!python object_detection/builders/model_builder_tf2_test.py
```

```

Running tests under Python 3.7.13: /usr/bin/python3
[ RUN      ] ModelBuilderTF2Test.test_create_center_net_deepmac
2022-04-15 14:10:12.347063: W tensorflow/core/common_runtime/gpu/gpu_bfc_allocator.cc
W0415 14:10:12.684142 140063247366016 model_builder.py:1102] Building experimental De
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_center_net_deepmac): 3.
I0415 14:10:13.176468 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[ OK ] ModelBuilderTF2Test.test_create_center_net_deepmac
[ RUN      ] ModelBuilderTF2Test.test_create_center_net_model0 (customize_head_params
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_center_net_model0 (custo
I0415 14:10:13.861573 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[ OK ] ModelBuilderTF2Test.test_create_center_net_model0 (customize_head_params
[ RUN      ] ModelBuilderTF2Test.test_create_center_net_model1 (customize_head_params
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_center_net_model1 (custo
I0415 14:10:14.224009 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[ OK ] ModelBuilderTF2Test.test_create_center_net_model1 (customize_head_params
[ RUN      ] ModelBuilderTF2Test.test_create_center_net_model1 (customize_head_params
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_center_net_model1 (custo
I0415 14:10:14.558833 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[ OK ] ModelBuilderTF2Test.test_create_center_net_model1 (customize_head_params
[ RUN      ] ModelBuilderTF2Test.test_create_center_net_model_from_keypoints
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_center_net_model_from_k
I0415 14:10:14.558833 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[ OK ] ModelBuilderTF2Test.test_create_center_net_model_from_keypoints
[ RUN      ] ModelBuilderTF2Test.test_create_center_net_model_mobilenet
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_center_net_model_mobile
I0415 14:10:17.253685 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[ OK ] ModelBuilderTF2Test.test_create_center_net_model_mobilenet
[ RUN      ] ModelBuilderTF2Test.test_create_experimental_model
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_experimental_model): 0.0
I0415 14:10:17.254873 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF

```

```

[      OK ] ModelBuilderTF2Test.test_create_experimental_model
[ RUN      ] ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_featur
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_from_config
I0415 14:10:17.284246 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[      OK ] ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_featur
[ RUN      ] ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_featur
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_from_config
I0415 14:10:17.303801 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[      OK ] ModelBuilderTF2Test.test_create_faster_rcnn_from_config_with_crop_featur
[ RUN      ] ModelBuilderTF2Test.test_create_faster_rcnn_model_from_config_with_examp
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_model_from_
I0415 14:10:17.324357 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[      OK ] ModelBuilderTF2Test.test_create_faster_rcnn_model_from_config_with_examp
[ RUN      ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rc
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_
I0415 14:10:17.465739 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[      OK ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rc
[ RUN      ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rc
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_
I0415 14:10:17.602513 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[      OK ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_faster_rc
[ RUN      ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_
I0415 14:10:17.734387 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[      OK ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn
[ RUN      ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_faster_rcnn_models_from_
I0415 14:10:17.868176 140063247366016 test_util.py:2374] time(__main__.ModelBuilderTF
[      OK ] ModelBuilderTF2Test.test_create_faster_rcnn_models_from_config_mask_rcnn
[ RUN      ] ModelBuilderTF2Test.test_create_rfcn_model_from_config
INFO:tensorflow:time(__main__.ModelBuilderTF2Test.test_create_rfcn_model_from_config)

```

## NEXT TO 1.TRAIN

```
cd /content
```

```
    /content
```

```
pwd
```

```
    '/content/models/research'
```

```
cd /content/drive/MyDrive/training_demo
```

```
[Errno 2] No such file or directory: '/content/drive/MyDrive/training_demo'
/content/drive/MyDrive/1.Deep_Learning/training_demo/models/research
```

```
!mkdir workspace
```

```
cd workspace
```

```
/content/drive/MyDrive/training_demo/workspace
```

```
!mkdir training_demo
!mkdir annotations
!mkdir exported-models
!mkdir images
!mkdir models
!mkdir pre-trained-models
```

```
!mkdir scripts
!mkdir preprocessing
```

```
cd images
```

```
/content/workspace/images
```

```
!mkdir test
!mkdir train
```

```
cd /content/workspace/download image
```

```
/content/workspace/download image
```

```
pwd
```

```
'/content/workspace/images'
```

```
cd ../models/
```

```
/content/workspace/pre-trained-models
```

```
!mkdir ssd_mobilenet_v2_fpn-lite
```

Double-click (or enter) to edit

```
pwd
```

```
'/content/drive/MyDrive/1.Deep_Learning/training_demo/models/research'
```

## 1. TRAIN DATA

```
cd /content/drive/MyDrive/1.Deep_Learning/training_demo

/content/drive/MyDrive/1.Deep_Learning/training_demo

ls

exporter_main_v2.py      generate_tfrecord.py  models/
export_tflite_graph_tf2.py  model_main_tf2.py    workspace/
```

## 2. Setup Paths

```
WORKSPACE_PATH = 'workspace'
SCRIPTS_PATH = WORKSPACE_PATH+'/scripts'
APIMODEL_PATH = WORKSPACE_PATH+ 'Tensorflow/models'
ANNOTATION_PATH = WORKSPACE_PATH+'/annotations'
IMAGE_PATH = WORKSPACE_PATH+'/images'
MODEL_PATH = WORKSPACE_PATH+'/models'
PRETRAINED_MODEL_PATH = WORKSPACE_PATH+'/pre-trained-models'
CONFIG_PATH = MODEL_PATH+'/my_ssd_mobnet/pipeline.config'
CHECKPOINT_PATH = MODEL_PATH+'/my_ssd_resnet101_v1_fpn/'
```

```
pwd

'/content/drive/MyDrive/1.Deep_Learning/training_demo'

cd ..

/content/drive/MyDrive/training_demo
```

## 3. Create Label Map

```
labels = [{'name':'hello', 'id':1}, {'name':'iloveyou', 'id':2}]

with open(ANNOTATION_PATH + '/label_map.pbtxt', 'w') as f:
    for label in labels:
        f.write('item { \n')
        f.write('\tname:\''+label['name']+'\n'.format(label['name']))
        f.write('\tid:'+label['id']+'\n'.format(label['id']))
        f.write('}\n')
```

## ▼ Generate tf record

```
!python {SCRIPTS_PATH + '/generate_tfrecord.py'} -x {IMAGE_PATH + '/train'} -l {ANNOTATION_PA
!python {SCRIPTS_PATH + '/generate_tfrecord.py'} -x{IMAGE_PATH + '/test'} -l {ANNOTATION_PATH

Successfully created the TFRecord file: workspace/annotations/train.record
Successfully created the TFRecord file: workspace/annotations/test.record
```

### 3. Download TF Models Pretrained Models from Tensorflow Model Zo

### 4. Copy Model Config to Training Folder

```
pwd
```

```
'/content/drive/MyDrive/1.Deep_Learning/training_demo'
```

```
CUSTOM_MODEL_NAME = 'my_ssd_resnet101_v1_fpn'
```

```
!mkdir {'/workspace/models/' + CUSTOM_MODEL_NAME}
```

```
mkdir: cannot create directory '/workspace/models/my_ssd_resnet101_v1_fpn': No such file
```



### 5. Update Config For Transfer Learning

```
import tensorflow as tf
from object_detection.utils import config_util
from object_detection.protos import pipeline_pb2
from google.protobuf import text_format
```

```
CONFIG_PATH = MODEL_PATH+'/' +CUSTOM_MODEL_NAME+'/pipeline.config'
```

```
CONFIG_PATH
```

```
'workspace/models/my_ssd_resnet101_v1_fpn/pipeline.config'
```

```
config = config_util.get_configs_from_pipeline_file(CONFIG_PATH)
```

```
config
```

```
{'eval_config': metrics_set: "coco_detection_metrics"
  use_moving_averages: false,
```

```

'eval_input_config': label_map_path: "workspace/annotations/label_map.pbtxt"
shuffle: false
num_epochs: 1
tf_record_input_reader {
  input_path: "workspace/annotations/test.record"
},
'eval_input_configs': [label_map_path: "workspace/annotations/label_map.pbtxt"
shuffle: false
num_epochs: 1
tf_record_input_reader {
  input_path: "workspace/annotations/test.record"
}
],
'model': ssd {
  num_classes: 2
  image_resizer {
    fixed_shape_resizer {
      height: 512
      width: 512
    }
  }
  feature_extractor {
    type: "ssd_resnet101_v1_fpn_keras"
    depth_multiplier: 1.0
    min_depth: 16
    conv_hyperparams {
      regularizer {
        l2_regularizer {
          weight: 0.00039999998989515007
        }
      }
      initializer {
        truncated_normal_initializer {
          mean: 0.0
          stddev: 0.029999999329447746
        }
      }
      activation: RELU_6
      batch_norm {
        decay: 0.996999979019165
        scale: true
        epsilon: 0.0010000000474974513
      }
    }
    override_base_feature_extractor_hyperparams: true
    fpn {
      min_level: 3
      max_level: 7
    }
  }
  box_coder {
    faster_rcnn_box_coder {
      y_scale: 10.0
      x_scale: 10.0
      height_scale: 5.0

```



```

pipeline_config = pipeline_pb2.TrainEvalPipelineConfig()
with tf.io.gfile.GFile(CONFIG_PATH, "r") as f:
    proto_str = f.read()
    text_format.Merge(proto_str, pipeline_config)

pipeline_config.model.ssd.num_classes = 2
pipeline_config.train_config.batch_size = 8
pipeline_config.train_config.fine_tune_checkpoint = PRETRAINED_MODEL_PATH + '/ssd_resnet101_v1_
pipeline_config.train_config.fine_tune_checkpoint_type = "detection"
pipeline_config.train_input_reader.label_map_path= ANNOTATION_PATH + '/label_map.pbtxt'
pipeline_config.train_input_reader.tf_record_input_reader.input_path[:] = [ANNOTATION_PATH +
pipeline_config.eval_input_reader[0].label_map_path = ANNOTATION_PATH + '/label_map.pbtxt'
pipeline_config.eval_input_reader[0].tf_record_input_reader.input_path[:] = [ANNOTATION_PATH

config_text = text_format.MessageToString(pipeline_config)
with tf.io.gfile.GFile(CONFIG_PATH, "wb") as f:
    f.write(config_text)

```

## 6. Train the model

```

print("""--model_dir={}/{}""".format(API_MODEL_PATH, MODEL_PATH, CUSTOM_MODEL_NAME, MODEL_PATH, C

--model_dir=workspaceTensorflow/models/workspace/models

print("""python {}/research/object_detection/model_main_tf2.py --model_dir={}/{} --pipeline_

python /workspaceTensorflow/models/research/object_detection/model_main_tf2.py --model_c

```

train

pwd

```

'/content/drive/MyDrive/training_demo'

```

```

!pip uninstall opencv-python-headless==4.5.5.62 -y
!pip install opencv-python-headless==4.5.2.52

```

```

Found existing installation: opencv-python-headless 4.5.5.64
Uninstalling opencv-python-headless-4.5.5.64:
  Successfully uninstalled opencv-python-headless-4.5.5.64
Collecting opencv-python-headless==4.5.2.52
  Downloading opencv_python_headless-4.5.2.52-cp37-cp37m-manylinux2014_x86_64.whl (38.2
  |████████████████████████████████████████████████████████████████████████████████| 38.2 MB 1.3 MB/s
Requirement already satisfied: numpy>=1.14.5 in /usr/local/lib/python3.7/dist-packages (

```

Installing collected packages: opencv-python-headless  
 Successfully installed opencv-python-headless-4.5.2.52

```
!python model_main_tf2.py --model_dir=workspace/models/my_ssd_resnet101_v1_fpn --pipeline_con
```

```
2022-04-15 14:34:29.350172: W tensorflow/core/common_runtime/gpu/gpu_bfc_allocator.cc
INFO:tensorflow:Using MirroredStrategy with devices ('/job:localhost/replica:0/task:0
I0415 14:34:29.357186 140012924012416 mirrored_strategy.py:374] Using MirroredStrategy
INFO:tensorflow:Maybe overwriting train_steps: None
I0415 14:34:29.363899 140012924012416 config_util.py:552] Maybe overwriting train_steps
INFO:tensorflow:Maybe overwriting use_bfloat16: False
I0415 14:34:29.364115 140012924012416 config_util.py:552] Maybe overwriting use_bfloat16
WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/object_detection/model
Instructions for updating:
rename to distribute_datasets_from_function
W0415 14:34:29.530227 140012924012416 deprecation.py:343] From /usr/local/lib/python3
Instructions for updating:
rename to distribute_datasets_from_function
INFO:tensorflow:Reading unweighted datasets: ['workspace/annotations/train.record']
I0415 14:34:29.540631 140012924012416 dataset_builder.py:162] Reading unweighted data
INFO:tensorflow:Reading record datasets for input file: ['workspace/annotations/train
I0415 14:34:29.541064 140012924012416 dataset_builder.py:79] Reading record datasets
INFO:tensorflow:Number of filenames to read: 1
I0415 14:34:29.541230 140012924012416 dataset_builder.py:80] Number of filenames to read
WARNING:tensorflow:num_readers has been reduced to 1 to match input file shards.
W0415 14:34:29.541376 140012924012416 dataset_builder.py:87] num_readers has been reduced
WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/object_detection/build
Instructions for updating:
Use `tf.data.Dataset.interleave(map_func, cycle_length, block_length, num_parallel_calls)
W0415 14:34:29.544359 140012924012416 deprecation.py:343] From /usr/local/lib/python3
Instructions for updating:
Use `tf.data.Dataset.interleave(map_func, cycle_length, block_length, num_parallel_calls)
WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/object_detection/build
Instructions for updating:
Use `tf.data.Dataset.map()`
W0415 14:34:29.568969 140012924012416 deprecation.py:343] From /usr/local/lib/python3
Instructions for updating:
Use `tf.data.Dataset.map()`
WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/tensorflow/python/util
Instructions for updating:
Create a `tf.sparse.SparseTensor` and use `tf.sparse.to_dense` instead.
W0415 14:34:38.327234 140012924012416 deprecation.py:343] From /usr/local/lib/python3
Instructions for updating:
Create a `tf.sparse.SparseTensor` and use `tf.sparse.to_dense` instead.
WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/tensorflow/python/util
Instructions for updating:
`seed2` arg is deprecated. Use sample_distorted_bounding_box_v2 instead.
W0415 14:34:42.088109 140012924012416 deprecation.py:343] From /usr/local/lib/python3
Instructions for updating:
`seed2` arg is deprecated. Use sample_distorted_bounding_box_v2 instead.
WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/tensorflow/python/util
Instructions for updating:
Use `tf.cast` instead.
W0415 14:34:44.179200 140012924012416 deprecation.py:343] From /usr/local/lib/python3
```

```

Instructions for updating:
Use `tf.cast` instead.
/usr/local/lib/python3.7/dist-packages/keras/backend.py:450: UserWarning: `tf.keras.b
  warnings.warn("`tf.keras.backend.set_learning_phase` is deprecated and '
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast
I0415 14:35:30.586774 140012924012416 cross_device_ops.py:618] Reduce to /job:localho
INFO:tensorflow:Reduce to /job:localhost/replica:0/task:0/device:CPU:0 then broadcast
I0415 14:35:30.588457 140012924012416 cross_device_ops.py:618] Reduce to /job:localho

```

## evaluasi mmodel dengan tensor board

pwd

```
'/content/drive/MyDrive/1.Deep_Learning/training_demo'
```

```
!tensorboard --logdir=workspace/models/my_ssd_resnet50_v1_fpn
```

NOTE: Using experimental fast data loading logic. To disable, pass  
 "--load\_fast=false" and report issues on GitHub. More details:  
<https://github.com/tensorflow/tensorboard/issues/4784>

Serving TensorBoard on localhost; to expose to the network, use a proxy or pass --bind\_@  
 TensorBoard 2.8.0 at <http://localhost:6006/> (Press CTRL+C to quit)

Error in atexit.\_run\_exitfuncs:

Traceback (most recent call last):

```
File "/usr/lib/python3.7/logging/__init__.py", line 2035, in shutdown
    h.acquire()
```

```
File "/usr/lib/python3.7/logging/__init__.py", line 842, in acquire
    if self.lock:
```

KeyboardInterrupt

During handling of the above exception, another exception occurred:

Traceback (most recent call last):

```
File "/usr/lib/python3.7/logging/__init__.py", line 2045, in shutdown
    h.release()
```

```
File "/usr/lib/python3.7/logging/__init__.py", line 850, in release
    self.lock.release()
```

RuntimeError: cannot release un-acquired lock

## Mengekspor Model Terlatih

```
cd /content/drive/MyDrive/1.Deep_Learning/training_demo
```

```
/content/drive/MyDrive/1.Deep_Learning/training_demo
```

```
pwd
```

```
'/content/drive/MyDrive/1.Deep_Learning/training_demo/models/research'
```

```
!python exporter_main_v2.py --input_type image_tensor --pipeline_config_path workspace/models
```

```

2022-04-15 17:29:58.721787: W tensorflow/core/common_runtime/gpu/gpu_bfc_allocator.cc:39
WARNING:tensorflow:From /usr/local/lib/python3.7/dist-packages/tensorflow/python/autogra
Instructions for updating:
back_prop=False is deprecated. Consider using tf.stop_gradient instead.
Instead of:
results = tf.map_fn(fn, elems, back_prop=False)
Use:
results = tf.nest.map_structure(tf.stop_gradient, tf.map_fn(fn, elems))
W0415 17:29:58.922650 139903474018176 deprecation.py:615] From /usr/local/lib/python3.7,
Instructions for updating:
back_prop=False is deprecated. Consider using tf.stop_gradient instead.
Instead of:
results = tf.map_fn(fn, elems, back_prop=False)
Use:
results = tf.nest.map_structure(tf.stop_gradient, tf.map_fn(fn, elems))
2022-04-15 17:30:26.688021: W tensorflow/python/util/util.cc:368] Sets are not currently
WARNING:tensorflow:Skipping full serialization of Keras layer <object_detection.meta_arc
W0415 17:30:31.223267 139903474018176 save_impl.py:72] Skipping full serialization of Ke
W0415 17:31:17.312363 139903474018176 save.py:265] Found untraced functions such as Weig
INFO:tensorflow:Assets written to: workspace/exported-models/my_model/saved_model/assets:
I0415 17:31:32.106069 139903474018176 builder_impl.py:780] Assets written to: workspace,
INFO:tensorflow:Writing pipeline config file to workspace/exported-models/my_model/pipel
I0415 17:31:33.317781 139903474018176 config_util.py:254] Writing pipeline config file t

```

```
pwd
```

```
'/content/drive/MyDrive/1.Deep_Learning/training_demo'
```

```
"""
```

```
Object Detection (On Image) From TF2 Saved Model
```

```
=====
```

```
"""
```

```

import os
os.environ['TF_CPP_MIN_LOG_LEVEL'] = '2'    # Suppress TensorFlow logging (1)
import pathlib
import tensorflow as tf
import cv2
import argparse
from google.colab.patches import cv2_imshow

```

```

# PROVIDE PATH TO IMAGE DIRECTORY
IMAGE_PATHS = '/content/drive/MyDrive/1.Deep_Learning/training_demo/workspace/images/test_tra

# PROVIDE PATH TO MODEL DIRECTORY
PATH_TO_MODEL_DIR = '/content/drive/MyDrive/1.Deep_Learning/training_demo/workspace/exported-

# PROVIDE PATH TO LABEL MAP
PATH_TO_LABELS = '/content/drive/MyDrive/1.Deep_Learning/training_demo/workspace/annotations/

# PROVIDE THE MINIMUM CONFIDENCE THRESHOLD
MIN_CONF_THRESH = float(0.60)

# LOAD THE MODEL

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

PATH_TO_SAVED_MODEL = PATH_TO_MODEL_DIR + "/saved_model"

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

# LOAD SAVED MODEL AND BUILD 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))

# LOAD LABEL MAP DATA FOR PLOTTING

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

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

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))

print('Running inference for {}... '.format(IMAGE_PATHS), end='')

image = cv2.imread(IMAGE_PATHS)
image_rgb = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)
image_expanded = np.expand_dims(image_rgb, axis=0)

# The input needs to be a tensor, convert it using `tf.convert_to_tensor`.
input_tensor = tf.convert_to_tensor(image)
# The model expects a batch of images, so add an axis with `tf.newaxis`.
input_tensor = input_tensor[tf.newaxis, ...]

# input_tensor = np.expand_dims(image_np, 0)
detections = detect_fn(input_tensor)

# 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

# detection_classes should be ints.
detections['detection_classes'] = detections['detection_classes'].astype(np.int64)

image_with_detections = image.copy()

# SET MIN_SCORE_THRESH BASED ON YOU MINIMUM THRESHOLD FOR DETECTIONS
viz_utils.visualize_boxes_and_labels_on_image_array(
    image_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=0.5,
    agnostic_mode=False)

print('Done')
# DISPLAYS OUTPUT IMAGE
cv2_imshow(image_with_detections)
# CLOSSES WINDOW ONCE KEY IS PRESSED

```

Loading model...Done! Took 32.23614692687988 seconds

Running inference for /content/drive/MyDrive/1.Deep\_Learning/training\_demo/workspace/ima



PATH\_TO\_SAVED\_MODEL

```
'/workspace/exported-models/my_model/saved_model'
```

PATH\_TO\_MODEL\_DIR

```
'/workspace/exported-models/my_model'
```

```
pwd
```

```
'/content/drive/MyDrive/3.Tensorflow_models/models/research'
```

```
cd ../../../../
```

```
/content/drive/MyDrive
```

```
cd /content/drive/MyDrive/training_demo
```

```
/content/drive/MyDrive/training_demo
```

```
PATH_TO_MODEL_DIR = WORKSPACE_PATH+'/exported-models/my_model'
```

```
PATH_TO_LABELS = '/content/drive/MyDrive/training_demo/workspace/annotations/label_map.pbtxt'
```

```
PATH_TO_LABELS
```

```
'/content/drive/MyDrive/training_demo/workspace/annotations/label_map.pbtxt'
```

```
import time
```

```
from object_detection.utils import label_map_util
```

```
from object_detection.utils import visualization_utils as viz_utils
```

```
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 36.228121757507324 seconds
```

### ***Load label map data (for plotting)***

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

```
category_index
```



```
{1: {'id': 1, 'name': 'hello'}, 2: {'id': 2, 'name': 'iloveyou'}}
```

## ▼ Putting everything together

```
IMAGE_PATHS = '/content/drive/MyDrive/training_demo/workspace/images/test_train'
image_path = 'workspace/images/test_train/Salinan hello.cb53f245-808b-11ec-a933-f43909d8ce0f.j
```

```
image_path= config_util.get_configs_from_pipeline_file(image_path)
```

```
image_path
```

```
'workspace/images/test_train/Salinan hello.cb53f245-808b-11ec-a933-f43909d8ce0f.jpg'
```

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

```
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))
```

```
for image_path in IMAGE_PATHS:
```

```
    print('Running inference for {}... '.format(image_path), end='')
```

```
    image_np = load_image_into_numpy_array(image_path)
```

```
    # 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`.
input_tensor = input_tensor[tf.newaxis, ...]

# input_tensor = np.expand_dims(image_np, 0)
detections = detect_fn(input_tensor)

# 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

# detection_classes should be ints.
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()
plt.imshow(image_np_with_detections)
print('Done')
plt.show()

# sphinx_gallery_thumbnail_number = 2
```

Running inference for /...

```
-----  
IsADirectoryError                                Traceback (most recent call last)  
<ipython-input-44-235f1e21b5e7> in <module>()  
    25     print('Running inference for {}'.format(image_path), end='')  
    26  
---> 27     image_np = load_image_into_numpy_array(image_path)  
    28  
    29     # Things to try:
```

1 frames