Final_Project_Team_9-Code

December 11, 2023

Part 1- Feature extraction

[ ]:
```
import cv2
import matplotlib.pyplot as plt
import numpy as np
import imutils
from google.colab.patches import cv2_imshow
from IPython.display import display, Javascript
from google.colab.output import eval_js
from base64 import b64decode
import tensorflow as tf
import os
import pandas as pd
import matplotlib.patches as patches
from collections import defaultdict
from PIL import Image
```

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

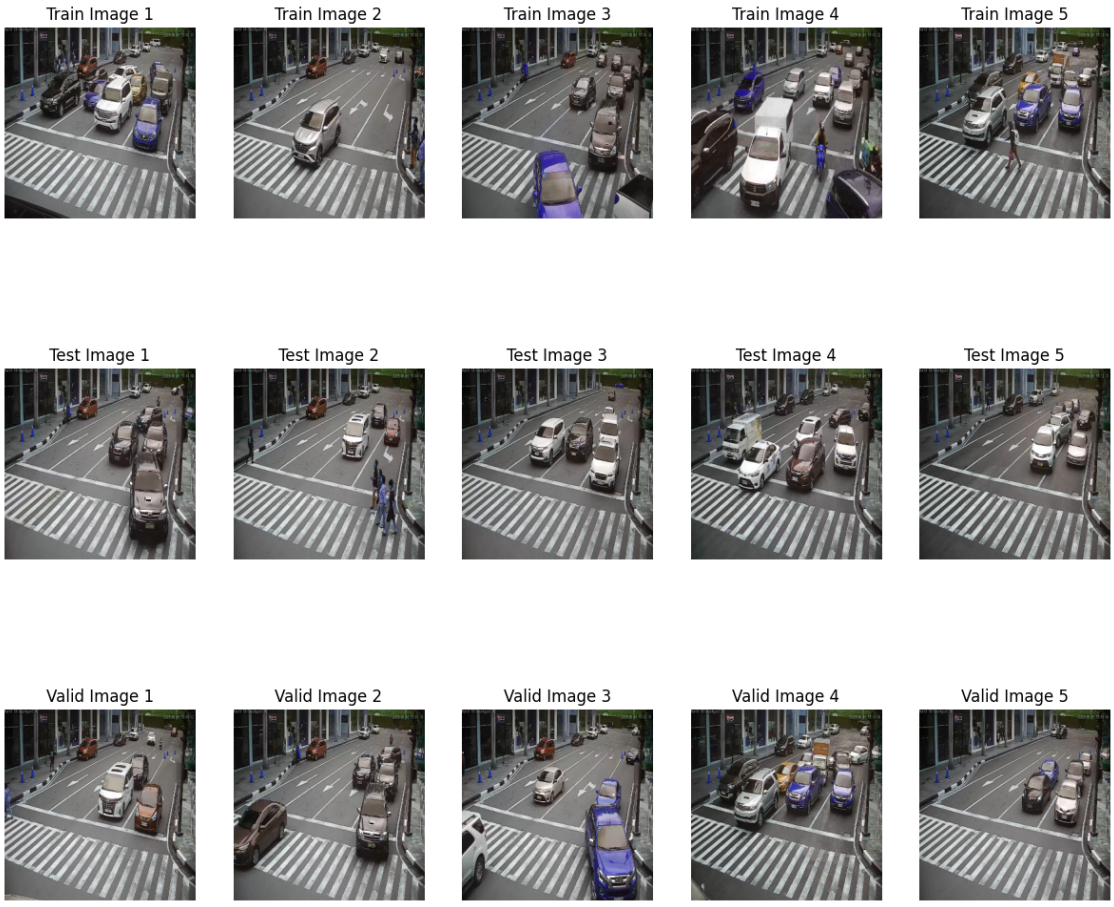
```
Mounted at /content/drive
```

[ ]:
```
#  base path for images and annotation files
base_image_path = '/content/drive/MyDrive/Vision/Project/dataset/'
annotations_base_path = '/content/drive/MyDrive/Vision/Project/dataset/'


# Function to load and preprocess images from a given folder
def load_and_preprocess_images(image_folder, annotation_file):
    annotations = pd.read_csv(annotation_file)
    images = {}
    bboxes = defaultdict(list)
    labels = defaultdict(list)
    scale_factor = 300 / 640  # resizing from 640x640 to 300x300

    for _, row in annotations.iterrows():
        filename = row['filename']
        image_path = os.path.join(image_folder, filename)
```

```
        if filename not in images:
            if os.path.exists(image_path):
                image = cv2.imread(image_path)
                image = cv2.resize(image, (300, 300))  # Resizing the image
                images[filename] = image
            else:
                print(f"Image {filename} not found.")
                continue

        # Scale bounding box coordinates
        xmin = int(row['xmin'] * scale_factor)
        ymin = int(row['ymin'] * scale_factor)
        xmax = int(row['xmax'] * scale_factor)
        ymax = int(row['ymax'] * scale_factor)
        bbox = [xmin, ymin, xmax, ymax]

        bboxes[filename].append(bbox)
        labels[filename].append(row['class'])

    # Convert the defaultdicts to lists
    images_list = list(images.values())
    bboxes_list = [bboxes[filename] for filename in images]
    labels_list = [labels[filename] for filename in images]

    return images_list, bboxes_list, labels_list

train_images, train_bboxes, train_labels = load_and_preprocess_images(
    os.path.join(base_image_path, 'train'),
    os.path.join(annotations_base_path, 'train/_annotations.csv')
)

test_images, test_bboxes, test_labels = load_and_preprocess_images(
    os.path.join(base_image_path, 'test'),
    os.path.join(annotations_base_path, 'test/_annotations.csv')
)

valid_images, valid_bboxes, valid_labels = load_and_preprocess_images(
    os.path.join(base_image_path, 'valid'),
    os.path.join(annotations_base_path, 'valid/_annotations.csv')
)
```

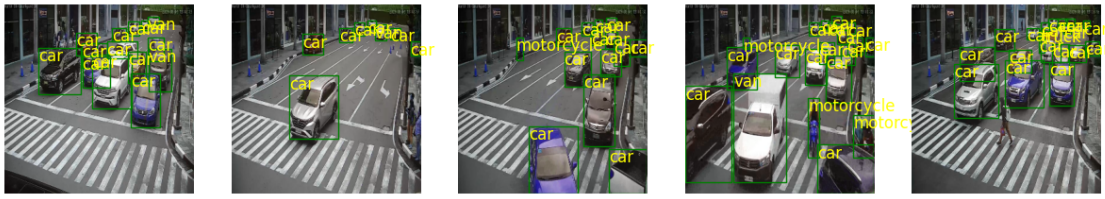
[ ]:
```
import matplotlib.pyplot as plt


def display_images(images, title):
    plt.figure(figsize=(15, 3))
    for i in range(min(5, len(images))):  # Display only the first 5 images
```

```
        plt.subplot(1, 5, i + 1)
        plt.imshow(images[i])
        plt.title(f"{title} {i+1}")
        plt.axis('off')
    plt.show()

# Display the first five images from each dataset
display_images(train_images, "Train Image")
display_images(test_images, "Test Image")
display_images(valid_images, "Valid Image")
```



[ ]:
```
# Function to display images with bounding boxes
def display_row_of_images_with_bboxes(image_list, bbox_list, label_list,␣
 ↪num_samples=5):

    num_samples = min(num_samples, len(image_list))
    plt.figure(figsize=(num_samples * 3, 3))
```

```
    for i in range(num_samples):
        ax = plt.subplot(1, num_samples, i + 1)
        plt.imshow(image_list[i])
        plt.axis('off')

        # Draw all bounding boxes for the current image
        for bbox, label in zip(bbox_list[i], label_list[i]):
            rect = patches.Rectangle(
                (bbox[0], bbox[1]), bbox[2] - bbox[0], bbox[3] - bbox[1],
                linewidth=1, edgecolor='g', facecolor='none'
            )
            ax.add_patch(rect)
            plt.text(bbox[0], bbox[1], label, color='yellow', fontsize=12,␣
 ↪verticalalignment='top')

    plt.show()

# Call the function with any of the datasets
display_row_of_images_with_bboxes(train_images, train_bboxes, train_labels)
```



Try different approach here

[ ]:
```
!pip --quiet install tf_slim
!git clone --depth 1 https://github.com/tensorflow/models
!pip --quiet install cython pillow lxml matplotlib pandas contextlib2 tf-slim
!pip --quiet install git+https://github.com/philferriere/cocoapi.
 ↪git#subdirectory=PythonAPI
```

```
Cloning into 'models'…
remote: Enumerating objects: 4065, done.
remote: Counting objects: 100% (4065/4065), done.
remote: Compressing objects: 100% (3090/3090), done.
remote: Total 4065 (delta 1186), reused 1949 (delta 915), pack-reused 0
Receiving objects: 100% (4065/4065), 54.71 MiB | 14.77 MiB/s, done.
Resolving deltas: 100% (1186/1186), done.
Updating files: 100% (3677/3677), done.
  Preparing metadata (setup.py) … done
  Building wheel for pycocotools (setup.py) … done
```

[ ]:
```
%cd /content/models/research
!protoc object_detection/protos/*.proto --python_out=.
os.environ['PYTHONPATH'] += ':/content/models/research:/content/models/research/
 ↪slim'
```

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

[ ]:
```
!python object_detection/builders/model_builder_tf2_test.py
```

```
2023-12-10 21:27:35.782801: W
tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not
find TensorRT
Traceback (most recent call last):
  File
"/content/models/research/object_detection/builders/model_builder_tf2_test.py",
line 24, in <module>
    from object_detection.builders import model_builder
  File "/content/models/research/object_detection/builders/model_builder.py",
line 37, in <module>
    from object_detection.meta_architectures import deepmac_meta_arch
  File "/content/models/research/object_detection/meta_architectures/deepmac_met
a_arch.py", line 28, in <module>
    import tensorflow_io as tfio  # pylint:disable=g-import-not-at-top
ModuleNotFoundError: No module named 'tensorflow_io'
```

[ ]:
```
import urllib.request
import tarfile
from object_detection.utils import config_util


MODEL_NAME = 'ssd_mobilenet_v2_fpnlite_320x320_coco17_tpu-8'
MODEL_DATE = '20200711'
MODEL_URL = f'http://download.tensorflow.org/models/object_detection/tf2/
 ↪{MODEL_DATE}/{MODEL_NAME}.tar.gz'


model_tar = tf.keras.utils.get_file(fname=MODEL_NAME + '.tar.gz',
                                    origin=MODEL_URL,
                                    untar=False)

# Extract the model
if not os.path.isdir(model_tar.replace('.tar.gz', '')):
    with tarfile.open(model_tar, "r:gz") as tar:
        tar.extractall(path=os.path.dirname(model_tar))

model_dir = model_tar.replace('.tar.gz', '')
```

```
# Set the path to the pipeline config file
pipeline_config_path = os.path.join(model_dir, 'pipeline.config')

# Load the pipeline config file
configs = config_util.get_configs_from_pipeline_file(pipeline_config_path)

print(f"Model {MODEL_NAME} downloaded and unpacked successfully.")
```

```
Downloading data from http://download.tensorflow.org/models/object_detection/tf2
/20200711/ssd_mobilenet_v2_fpnlite_320x320_coco17_tpu-8.tar.gz
20515344/20515344 [==============================] - 0s 0us/step
Model ssd_mobilenet_v2_fpnlite_320x320_coco17_tpu-8 downloaded and unpacked
successfully.
```

Shaping the data to feed the algorithm

[ ]:
```
label_map = """
item {
  id: 1
  name: 'car'
}
item {
  id: 2
  name: 'van'
}
item {
  id: 3
  name: 'motorcycle'
}
item {
  id: 4
  name: 'truck'
}
item {
  id: 5
  name: 'jeepney'
}
item {
  id: 6
  name: 'bus'
}
item {
  id: 7
  name: 'tricycle'
}
"""

# Save the label map
```

```
with open("/content/label_map.pbtxt", "w") as file:
    file.write(label_map)
```

[ ]:
```
# /content/label_map.pbtxt

from object_detection.utils import label_map_util

# Path to the label map file
label_map_path = '/content/label_map.pbtxt'

# Create the label map dictionary
label_map_dict = label_map_util.get_label_map_dict(label_map_path)
```

[ ]:
```
import tensorflow as tf
print(tf.__version__)
```

```
2.12.0
```

[ ]:
```
!pip --quiet install tf_slim
!git --quiet clone --depth 1 https://github.com/tensorflow/models
%cd /content/models/research
!protoc object_detection/protos/*.proto --python_out=.
!cp object_detection/packages/tf2/setup.py .
!python -m pip --quiet install .
```

```
unknown option: --quiet
usage: git [--version] [--help] [-C <path>] [-c <name>=<value>]
           [--exec-path[=<path>]] [--html-path] [--man-path] [--info-path]
           [-p | --paginate | -P | --no-pager] [--no-replace-objects] [--bare]
           [--git-dir=<path>] [--work-tree=<path>] [--namespace=<name>]
           [--super-prefix=<path>] [--config-env=<name>=<envvar>]
           <command> [<args>]
/content/models/research
  Preparing metadata (setup.py) … done
  Preparing metadata (setup.py) … done
                             14.7/14.7 MB
31.8 MB/s eta 0:00:00
                             2.7/2.7 MB
35.2 MB/s eta 0:00:00
                             28.8/28.8 MB
31.6 MB/s eta 0:00:00
                             67.8/67.8 kB
5.5 MB/s eta 0:00:00
                             116.6/116.6
kB 11.8 MB/s eta 0:00:00
                             1.3/1.3 MB
65.5 MB/s eta 0:00:00
```

```
                                    43.6/43.6 kB
4.5 MB/s eta 0:00:00
  Preparing metadata (setup.py) … done
                                    241.2/241.2
kB 22.7 MB/s eta 0:00:00
                                    5.2/5.2 MB
93.4 MB/s eta 0:00:00
                                    475.2/475.2
MB 2.0 MB/s eta 0:00:00
                                    89.7/89.7 kB
9.1 MB/s eta 0:00:00
  Preparing metadata (setup.py) … done
                                    138.7/138.7
kB 15.0 MB/s eta 0:00:00
                                    152.0/152.0
kB 17.2 MB/s eta 0:00:00
  Preparing metadata (setup.py) … done
                                    3.1/3.1 MB
68.1 MB/s eta 0:00:00
                                    43.5/43.5 kB
4.0 MB/s eta 0:00:00
  Preparing metadata (setup.py) … done
                                    1.0/1.0 MB
50.2 MB/s eta 0:00:00
                                    677.1/677.1
kB 37.1 MB/s eta 0:00:00
                                    5.4/5.4 MB
64.6 MB/s eta 0:00:00
  Preparing metadata (setup.py) … done
                                    300.4/300.4
kB 19.0 MB/s eta 0:00:00
                                    5.5/5.5 MB
54.8 MB/s eta 0:00:00
                                    442.0/442.0
kB 30.2 MB/s eta 0:00:00
                                    1.7/1.7 MB
59.6 MB/s eta 0:00:00
  Building wheel for object-detection (setup.py) … done
  Building wheel for avro-python3 (setup.py) … done
  Building wheel for crcmod (setup.py) … done
  Building wheel for dill (setup.py) … done
  Building wheel for hdfs (setup.py) … done
  Building wheel for seqeval (setup.py) … done
  Building wheel for pyjsparser (setup.py) … done
```

```
[ ]: import os
     import io
     import pandas as pd
     import tensorflow as tf

     from PIL import Image
     from object_detection.utils import dataset_util, label_map_util

     def create_tf_example(image, bboxes, labels, label_map):
         # Convert the ndarray image to bytes
         image_encoded = tf.io.encode_jpeg(tf.constant(image)).numpy()

         # Image shape
         height, width, _ = image.shape

         xmins, xmaxs, ymins, ymaxs = [], [], [], []
         classes_text, classes = [], []

         for bbox, label in zip(bboxes, labels):
             # Normalizing bounding box coordinates
             xmins.append(bbox[0] / width)
             xmaxs.append(bbox[2] / width)
             ymins.append(bbox[1] / height)
             ymaxs.append(bbox[3] / height)

             classes_text.append(label.encode('utf8'))
             classes.append(label_map[label])

         tf_example = tf.train.Example(features=tf.train.Features(feature={
             'image/height': dataset_util.int64_feature(height),
             'image/width': dataset_util.int64_feature(width),
             'image/encoded': dataset_util.bytes_feature(image_encoded),
             'image/format': dataset_util.bytes_feature(b'jpeg'),
             'image/object/bbox/xmin': dataset_util.float_list_feature(xmins),
             'image/object/bbox/xmax': dataset_util.float_list_feature(xmaxs),
             'image/object/bbox/ymin': dataset_util.float_list_feature(ymins),
             'image/object/bbox/ymax': dataset_util.float_list_feature(ymaxs),
             'image/object/class/text': dataset_util.
      ↪bytes_list_feature(classes_text),
             'image/object/class/label': dataset_util.int64_list_feature(classes),
         }))
         return tf_example

     def create_tf_record(output_filename, label_map, images, bboxes, labels):
         writer = tf.io.TFRecordWriter(output_filename)
         for image, bbox, label in zip(images, bboxes, labels):
             tf_example = create_tf_example(image, bbox, label, label_map)
```

```
        writer.write(tf_example.SerializeToString())
    writer.close()
    print(f"Successfully created TFRecord file: {output_filename}")

create_tf_record('/content/train.record', label_map_dict, train_images,␣
 ↪train_bboxes, train_labels)
```

```
Successfully created TFRecord file: /content/train.record
```

[ ]:
```
import tensorflow as tf
from google.protobuf import text_format
from object_detection.protos import pipeline_pb2

pipeline_config = pipeline_pb2.TrainEvalPipelineConfig()

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

pipeline_config.model.ssd.num_classes = 7  # Set number of classes
pipeline_config.train_config.batch_size = 4  # Example batch size, adjust as␣
 ↪needed
pipeline_config.train_config.fine_tune_checkpoint = os.path.join(model_dir,␣
 ↪"checkpoint/ckpt-0")
pipeline_config.train_config.fine_tune_checkpoint_type = "detection"
pipeline_config.train_input_reader.label_map_path = '/content/label_map.pbtxt'
pipeline_config.train_input_reader.tf_record_input_reader.input_path[:] = ['/
 ↪content/train.record']
pipeline_config.eval_input_reader[0].label_map_path = '/content/label_map.pbtxt'
pipeline_config.eval_input_reader[0].tf_record_input_reader.input_path[:] = ['/
 ↪content/valid.record']  # Update with your validation record

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

[ ]:
```
pipeline_config_path = os.path.join(model_dir, 'pipeline.config')
```

[ ]:
```
!python /content/models/research/object_detection/model_main_tf2.py \
    --pipeline_config_path={pipeline_config_path} \
    --model_dir=/content/training \
    --alsologtostderr \
    --num_train_steps=5000 \
    --sample_1_of_n_eval_examples=1 \
    --num_eval_steps=500
```

```
2023-12-10 21:30:26.561925: E
```

```
external/local_xla/xla/stream_executor/cuda/cuda_dnn.cc:9261] Unable to register
cuDNN factory: Attempting to register factory for plugin cuDNN when one has
already been registered
2023-12-10 21:30:26.562011: E
external/local_xla/xla/stream_executor/cuda/cuda_fft.cc:607] Unable to register
cuFFT factory: Attempting to register factory for plugin cuFFT when one has
already been registered
2023-12-10 21:30:26.563358: E
external/local_xla/xla/stream_executor/cuda/cuda_blas.cc:1515] Unable to
register cuBLAS factory: Attempting to register factory for plugin cuBLAS when
one has already been registered
2023-12-10 21:30:28.483698: W
tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not
find TensorRT
INFO:tensorflow:Using MirroredStrategy with devices
('/job:localhost/replica:0/task:0/device:CPU:0',)
I1210 21:30:39.990427 135636053291008 mirrored_strategy.py:423] Using
MirroredStrategy with devices ('/job:localhost/replica:0/task:0/device:CPU:0',)
INFO:tensorflow:Maybe overwriting train_steps: 5000
I1210 21:30:40.030739 135636053291008 config_util.py:552] Maybe overwriting
train_steps: 5000
INFO:tensorflow:Maybe overwriting use_bfloat16: False
I1210 21:30:40.031188 135636053291008 config_util.py:552] Maybe overwriting
use_bfloat16: False
WARNING:tensorflow:From
/content/models/research/object_detection/model_lib_v2.py:563:
StrategyBase.experimental_distribute_datasets_from_function (from
tensorflow.python.distribute.distribute_lib) is deprecated and will be removed
in a future version.
Instructions for updating:
rename to distribute_datasets_from_function
W1210 21:30:40.093429 135636053291008 deprecation.py:50] From
/content/models/research/object_detection/model_lib_v2.py:563:
StrategyBase.experimental_distribute_datasets_from_function (from
tensorflow.python.distribute.distribute_lib) is deprecated and will be removed
in a future version.
Instructions for updating:
rename to distribute_datasets_from_function
INFO:tensorflow:Reading unweighted datasets: ['/content/train.record']
I1210 21:30:40.108077 135636053291008 dataset_builder.py:162] Reading unweighted
datasets: ['/content/train.record']
INFO:tensorflow:Reading record datasets for input file:
['/content/train.record']
I1210 21:30:40.108438 135636053291008 dataset_builder.py:79] Reading record
datasets for input file: ['/content/train.record']
INFO:tensorflow:Number of filenames to read: 1
I1210 21:30:40.108573 135636053291008 dataset_builder.py:80] Number of filenames
to read: 1
```

```
WARNING:tensorflow:num_readers has been reduced to 1 to match input file shards.
W1210 21:30:40.108669 135636053291008 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:100:
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.AUTOTUNE)` instead. If sloppy execution is desired,
use `tf.data.Options.deterministic`.
W1210 21:30:40.121199 135636053291008 deprecation.py:50] From
/content/models/research/object_detection/builders/dataset_builder.py:100:
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.AUTOTUNE)` instead. If sloppy execution is desired,
use `tf.data.Options.deterministic`.
WARNING:tensorflow:From
/content/models/research/object_detection/builders/dataset_builder.py:235:
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()
W1210 21:30:40.184843 135636053291008 deprecation.py:50] From
/content/models/research/object_detection/builders/dataset_builder.py:235:
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()
Traceback (most recent call last):
  File "/content/models/research/object_detection/model_main_tf2.py", line 114,
in <module>
    tf.compat.v1.app.run()
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/platform/app.py", line 36, in run
    _run(main=main, argv=argv, flags_parser=_parse_flags_tolerate_undef)
  File "/usr/local/lib/python3.10/dist-packages/absl/app.py", line 308, in run
    _run_main(main, args)
  File "/usr/local/lib/python3.10/dist-packages/absl/app.py", line 254, in
_run_main
    sys.exit(main(argv))
  File "/content/models/research/object_detection/model_main_tf2.py", line 105,
in main
    model_lib_v2.train_loop(
```

```
  File "/content/models/research/object_detection/model_lib_v2.py", line 563, in
train_loop
    train_input = strategy.experimental_distribute_datasets_from_function(
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/util/deprecation.py", line 383, in new_func
    return func(*args, **kwargs)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/distribute/distribute_lib.py", line 1563, in
experimental_distribute_datasets_from_function
    return self.distribute_datasets_from_function(dataset_fn, options)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/distribute/distribute_lib.py", line 1554, in
distribute_datasets_from_function
    return self._extended._distribute_datasets_from_function(  # pylint:
disable=protected-access
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/distribute/mirrored_strategy.py", line 613, in
_distribute_datasets_from_function
    return input_util.get_distributed_datasets_from_function(
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/distribute/input_util.py", line 144, in
get_distributed_datasets_from_function
    return input_lib.DistributedDatasetsFromFunction(
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/distribute/input_lib.py", line 1143, in __init__
    self.build()
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/distribute/input_lib.py", line 1165, in build
    _create_datasets_from_function_with_input_context(
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/distribute/input_lib.py", line 1680, in
_create_datasets_from_function_with_input_context
    dataset = dataset_fn(ctx)
  File "/content/models/research/object_detection/model_lib_v2.py", line 554, in
train_dataset_fn
    train_input = inputs.train_input(
  File "/content/models/research/object_detection/inputs.py", line 908, in
train_input
    dataset = INPUT_BUILDER_UTIL_MAP['dataset_build'](
  File "/content/models/research/object_detection/builders/dataset_builder.py",
line 250, in build
    dataset = dataset_map_fn(dataset, decoder.decode, batch_size,
  File "/content/models/research/object_detection/builders/dataset_builder.py",
line 235, in dataset_map_fn
    dataset = dataset.map_with_legacy_function(
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/util/deprecation.py", line 383, in new_func
    return func(*args, **kwargs)
```

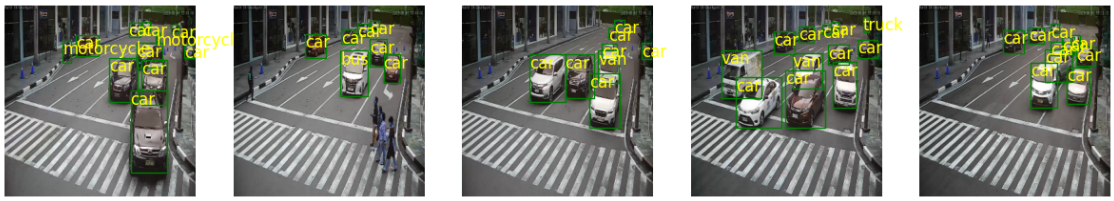
```
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/data/ops/dataset_ops.py", line 4128, in
map_with_legacy_function
    return map_op._map_v1_with_legacy_function(
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/data/ops/map_op.py", line 85, in
_map_v1_with_legacy_function
    _ParallelMapDataset(
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/data/ops/map_op.py", line 148, in __init__
    self._map_func = structured_function.StructuredFunctionWrapper(
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/data/ops/structured_function.py", line 272, in
__init__
    self._function.add_to_graph(ops.get_default_graph())
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/framework/function.py", line 579, in add_to_graph
    self._create_definition_if_needed()
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/framework/function.py", line 412, in
_create_definition_if_needed
    self._create_definition_if_needed_impl()
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/framework/function.py", line 430, in
_create_definition_if_needed_impl
    temp_graph = func_graph_from_py_func(
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/framework/function.py", line 1007, in
func_graph_from_py_func
    outputs = func(*func_graph.inputs)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/data/ops/structured_function.py", line 178, in
wrapped_fn
    ret = wrapper_helper(*args)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/data/ops/structured_function.py", line 161, in
wrapper_helper
    ret = autograph.tf_convert(self._func, ag_ctx)(*nested_args)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/impl/api.py", line 693, in wrapper
    raise e.ag_error_metadata.to_exception(e)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/impl/api.py", line 690, in wrapper
    return converted_call(f, args, kwargs, options=options)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/impl/api.py", line 439, in converted_call
    result = converted_f(*effective_args, **kwargs)
  File "/tmp/__autograph_generated_filebnj1sggw.py", line 74, in tf__decode
```

```
    tensors = ag__.converted_call(ag__.ld(decoder).decode,
(ag__.ld(serialized_example),), dict(items=ag__.ld(keys)), fscope)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/impl/api.py", line 439, in converted_call
    result = converted_f(*effective_args, **kwargs)
  File "/tmp/__autograph_generated_filei_av3all.py", line 81, in tf__decode
    ag__.for_stmt(ag__.ld(items), None, loop_body_1, get_state_3, set_state_3,
(), {'iterate_names': 'item'})
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/operators/control_flow.py", line 449, in
for_stmt
    for_fn(iter_, extra_test, body, get_state, set_state, symbol_names, opts)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/operators/control_flow.py", line 500, in
_py_for_stmt
    body(target)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/operators/control_flow.py", line 466, in
protected_body
    original_body(protected_iter)
  File "/tmp/__autograph_generated_filei_av3all.py", line 77, in loop_body_1
    ag__.converted_call(ag__.ld(outputs).append,
(ag__.converted_call(ag__.ld(handler).tensors_to_item,
(ag__.ld(keys_to_tensors),), None, fscope),), None, fscope)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/impl/api.py", line 441, in converted_call
    result = converted_f(*effective_args)
  File "/tmp/__autograph_generated_filedbof5tuo.py", line 39, in
tf__tensors_to_item
    ag__.if_stmt(ag__.ld(self)._repeated, if_body, else_body, get_state,
set_state, ('do_return', 'retval_'), 2)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/operators/control_flow.py", line 1217, in
if_stmt
    _py_if_stmt(cond, body, orelse)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/operators/control_flow.py", line 1270, in
_py_if_stmt
    return body() if cond else orelse()
  File "/tmp/__autograph_generated_filedbof5tuo.py", line 35, in else_body
    retval_ = ag__.converted_call(ag__.ld(self)._decode, (ag__.ld(image_buffer),
ag__.ld(image_format)), None, fscope)
  File "/usr/local/lib/python3.10/dist-
packages/tensorflow/python/autograph/impl/api.py", line 441, in converted_call
    result = converted_f(*effective_args)
  File "/tmp/__autograph_generated_filelcye6ujp.py", line 80, in tf___decode
    image = ag__.converted_call(ag__.ld(control_flow_ops).case,
(ag__.ld(pred_fn_pairs),), dict(default=ag__.ld(check_jpeg), exclusive=True),
```

```
fscope)
AttributeError: in user code:

    File
"/content/models/research/object_detection/data_decoders/tf_example_decoder.py",
line 556, in decode  *
        tensors = decoder.decode(serialized_example, items=keys)
    File "/usr/local/lib/python3.10/dist-
packages/tf_slim/data/tfexample_decoder.py", line 722, in decode  *
        outputs.append(handler.tensors_to_item(keys_to_tensors))
    File "/usr/local/lib/python3.10/dist-
packages/tf_slim/data/tfexample_decoder.py", line 405, in tensors_to_item  *
        return self._decode(image_buffer, image_format)
    File "/usr/local/lib/python3.10/dist-
packages/tf_slim/data/tfexample_decoder.py", line 453, in _decode  *
        image = control_flow_ops.case(

    AttributeError: module 'tensorflow.python.ops.control_flow_ops' has no
attribute 'case'
```

[ ]:
```
%load_ext tensorboard
%tensorboard --logdir /content/drive/MyDrive/Vision/Project/dataset/train
```

[ ]:
```
display_row_of_images_with_bboxes(test_images, test_bboxes, test_labels)
```



[ ]:
```
display_row_of_images_with_bboxes(valid_images, valid_bboxes, valid_labels)
```