# predict_load

July 15, 2025

[1]:
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# Explanation of prediction output when activation is sigmoid:
# https://forum.freecodecamp.org/t/model-predict-output/470349

import tensorflow as tf
import tensorflow_datasets as tfds
import logging, os
import pandas as pd
import time
from tensorflow.keras.models import load_model
import numpy as np
from sklearn import metrics
import matplotlib.pyplot as plt

BASE_PATH = "../../../../local_data/practice/tfds/"
DATA_PATH = "../../../../local_data/tfds/"
OUTPUT_PATH = BASE_PATH+"predict_example_01/"
os.system("mkdir -p " + OUTPUT_PATH)


# Load the dataset
(train_dataset, test_dataset), metadata = tfds.load(
    'cats_vs_dogs',
    data_dir=DATA_PATH,
    # split=['train[:80%]', 'train[80%:]'],
    split=['train[:80%]', 'train[99%:]'],
    with_info=True,
    as_supervised=True
)

print(f"Number of test samples: {test_dataset.cardinality()}")


# Preprocess the data
def preprocess(image, label):
    image = tf.cast(image, tf.float32)
    image = tf.image.resize(image, [256, 256])
    image = image / 255.0
```

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    return image, label

train_dataset = train_dataset.map(preprocess)
test_dataset = test_dataset.map(preprocess)

batch_size = 64
train_dataset = train_dataset.cache().batch(batch_size).prefetch(buffer_size=10)
test_dataset = test_dataset.cache().batch(batch_size).prefetch(buffer_size=10)

# Load model
filename = "epochs_5.000_date_20250708-215035.h5"
filename = "acc_0.966_epochs_8.000_date_20250710-211155.h5"
filename = "acc_0.703_epochs_1.000_date_20250711-141215.h5"
filename = "acc_0.742_epochs_1.000_date_20250711-142521.h5"
fullpath = f"{OUTPUT_PATH}{filename}"
model = load_model(fullpath)
model.summary()


# Make predictions
predictions = model.predict(test_dataset)
allpreds=predictions.flatten()
allpnorms = np.where(allpreds > 0.5, 1, 0)

alllabels=np.empty(0)
for images, labels in test_dataset:
    alllabels = np.append(alllabels, labels.numpy().flatten())

score = metrics.accuracy_score(alllabels, allpnorms)
print("Validation accuracy score: {}".format(score))

collabels = pd.DataFrame(alllabels, columns=["l"])
colpreds = pd.DataFrame( allpreds, columns=["pred"])
pnorm = pd.DataFrame( allpnorms, columns=["pnorm"])
diff = collabels["l"] - pnorm["pnorm"]

compare = pd.concat([collabels, colpreds,pnorm,diff], axis=1)
compare.columns = ["l", "pred", "pnorm","diff"]
print(compare)

compare.to_csv(OUTPUT_PATH + "pred_test_load.csv", index=False)
```

```
2025-07-15 20:56:43.299663: 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
2025-07-15 20:56:43.299696: E
external/local_xla/xla/stream_executor/cuda/cuda_fft.cc:607] Unable to register
```

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cuFFT factory: Attempting to register factory for plugin cuFFT when one has
already been registered
2025-07-15 20:56:43.300542: 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
2025-07-15 20:56:43.305537: I tensorflow/core/platform/cpu_feature_guard.cc:182]
This TensorFlow binary is optimized to use available CPU instructions in
performance-critical operations.
To enable the following instructions: SSE4.1 SSE4.2 AVX AVX2 FMA, in other
operations, rebuild TensorFlow with the appropriate compiler flags.
2025-07-15 20:56:45.545967: I
external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.546254: I
external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.607106: I
external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.607413: I
external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.607644: I
external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.607867: I
external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.753013: I
```

external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero. See more at https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-pci#L344-L355
2025-07-15 20:56:45.753271: I external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero. See more at https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-pci#L344-L355
2025-07-15 20:56:45.753488: I external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero. See more at https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-pci#L344-L355
2025-07-15 20:56:45.753694: I external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero. See more at https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-pci#L344-L355
2025-07-15 20:56:45.753894: I external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero. See more at https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-pci#L344-L355
2025-07-15 20:56:45.754098: I external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero. See more at https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-pci#L344-L355
2025-07-15 20:56:45.763479: I external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero. See more at https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-pci#L344-L355
2025-07-15 20:56:45.763713: I external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful NUMA node read from SysFS had negative value (-1), but there must be at least one NUMA node, so returning NUMA node zero. See more at https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-pci#L344-L355
2025-07-15 20:56:45.763931: I

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external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.764140: I
external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.764352: I
external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.764514: I
tensorflow/core/common_runtime/gpu/gpu_device.cc:1929] Created device
/job:localhost/replica:0/task:0/device:GPU:0 with 22462 MB memory:  -> device:
0, name: NVIDIA GeForce RTX 3090, pci bus id: 0000:81:00.0, compute capability:
8.6
2025-07-15 20:56:45.764967: I
external/local_xla/xla/stream_executor/cuda/cuda_executor.cc:901] successful
NUMA node read from SysFS had negative value (-1), but there must be at least
one NUMA node, so returning NUMA node zero. See more at
https://github.com/torvalds/linux/blob/v6.0/Documentation/ABI/testing/sysfs-bus-
pci#L344-L355
2025-07-15 20:56:45.765134: I
tensorflow/core/common_runtime/gpu/gpu_device.cc:1929] Created device
/job:localhost/replica:0/task:0/device:GPU:1 with 22462 MB memory:  -> device:
1, name: NVIDIA GeForce RTX 3090, pci bus id: 0000:c1:00.0, compute capability:
8.6

Number of test samples: 233
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 254, 254, 32)      896

 max_pooling2d (MaxPooling2  (None, 127, 127, 32)      0
 D)

 conv2d_1 (Conv2D)           (None, 125, 125, 64)      18496

 max_pooling2d_1 (MaxPoolin  (None, 62, 62, 64)        0
 g2D)
```

```
 flatten (Flatten)           (None, 246016)            0

 dense (Dense)               (None, 512)               125960704

 dense_1 (Dense)             (None, 1)                 513

=================================================================
Total params: 125980609 (480.58 MB)
Trainable params: 125980609 (480.58 MB)
Non-trainable params: 0 (0.00 Byte)
_________________________________________________________________
2025-07-15 20:56:53.175174: I
external/local_xla/xla/stream_executor/cuda/cuda_dnn.cc:454] Loaded cuDNN
version 8907
4/4 [==============================] - 1s 78ms/step
Validation accuracy score: 0.7424892703862661
       l      pred  pnorm  diff
0    1.0  0.688788      1   0.0
1    0.0  0.463511      0   0.0
2    1.0  0.753269      1   0.0
3    1.0  0.557541      1   0.0
4    1.0  0.857560      1   0.0
..   …       …    …   …
228  0.0  0.070332      0   0.0
229  0.0  0.873075      1  -1.0
230  0.0  0.272616      0   0.0
231  1.0  0.787487      1   0.0
232  0.0  0.276509      0   0.0

[233 rows x 4 columns]
```

[2]:
```python
# Load the dataset
(train_dataset, test_dataset), metadata = tfds.load(
    'cats_vs_dogs',
    data_dir=DATA_PATH,
    # split=['train[:80%]', 'train[80%:]'],
    split=['train[:80%]', 'train[99%:]'],
    with_info=True,
    as_supervised=True
)
number_of_images=233
allcorrect = (allpnorms == alllabels)

new_df=tfds.as_dataframe(test_dataset.take(number_of_images), metadata)
# new_df
```

```
new_df['predictions'] = allpreds[0:number_of_images]
new_df['pred norm'] = allpnorms[0:number_of_images]
new_df['correct'] = allcorrect[0:number_of_images]
new_df
```

[2]:

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                                                 image  label  predictions  \
0    [[[9, 0, 4], [10, 0, 5], [11, 2, 7], [13, 7, 1…      1     0.688788
1    [[[65, 86, 87], [58, 79, 80], [59, 80, 81], [7…      0     0.463511
2    [[[5, 7, 4], [5, 6, 1], [5, 4, 0], [12, 8, 0],…      1     0.753269
3    [[[42, 77, 37], [45, 80, 40], [47, 82, 42], [4…      1     0.557541
4    [[[44, 48, 31], [44, 48, 31], [45, 47, 33], [4…      1     0.857560
..                                                 …    …          …
228  [[[82, 91, 88], [82, 91, 88], [82, 91, 88], [8…      0     0.070332
229  [[[68, 74, 36], [68, 76, 37], [65, 75, 38], [5…      0     0.873075
230  [[[96, 86, 76], [101, 91, 81], [108, 99, 90], …      0     0.272616
231  [[[51, 45, 47], [52, 46, 48], [52, 46, 48], [5…      1     0.787487
232  [[[108, 108, 108], [112, 112, 112], [116, 116,…      0     0.276509

     pred norm  correct
0            1     True
1            0     True
2            1     True
3            1     True
4            1     True
..         …      …
228          0     True
229          1    False
230          0     True
231          1     True
232          0     True

[233 rows x 5 columns]
```