

Dog Breed Identification

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Introduction

- ▶ In this presentation today, we will go through TF2.0 Keras to build a Convolutional Neural Network that helps us to identify the breed of a dog from its image. In the process, we will use Transfer Learning and learn how to design, train and test models with the provided dataset.
- ▶ We are going to use the Dog Breed Identification dataset which can be easily downloaded from the Kaggle datasets. The dataset is designed for multiclass classification problem as it has 120 breeds of dogs.
- ▶ We are going to use the Convolutional Neural Network . Specifically Transfer Learning. Here we use MobileNev2 as the pre-trained model.

Data Processing

- ▶ In the process , we will first create a function that is going to read the image from the path and also resize it to the desired size. Then, we perform normalization to make the image pixels smaller by dividing them with the 255.
- ▶ Now we will use TensorFlow tf.data functions to create the dataset pipeline for training. The tf.parse function preprocess the single instance of the complete dataset. It preprocesses a single image and its label and return it to the dataset function.

```
50 def tf_parse(x, y):
51     x, y = tf.numpy_function(parse_data, [x, y], [tf.float32, tf.int32])
52     x.set_shape((224, 224, 3))
53     y.set_shape((120))
54     return x, y
55
56 def tf_dataset(x, y, batch=8):
57     dataset = tf.data.Dataset.from_tensor_slices((x, y))
58     dataset = dataset.map(tf_parse)
59     dataset = dataset.batch(batch)
60     dataset = dataset.repeat()
61     return dataset
62
```

Training

- ▶ Till now we have built the model and the training dataset pipeline. Now we are ready the training the model on the actual dataset. First we set the desired path for the training images and the labels.csv file with contain the name of the breeds. we split the dataset in the training and validation set by 80/20 ratio. In every Train our Batch size was 224.
- ▶ I have made 4 different Tests.
- ▶ Test 1 was using 1000 images and 2 epoch. Accuracy : 54.41%
- ▶ Test 2 was using 5000 images and 5 epoch. Accuracy : 99.95%
- ▶ Test 3 was using 1000 images and 10 epoch. Accuracy : 98.03%
(Validated with 200 images)
- ▶ Test 4 was using 10222 images and 15 epoch. Accuracy : 100%

Test 1

```
77
78     for image_id in ids:
79         image_id = image_id.split("\\\\")[-1].split(".")[-1]
80         breed_name = list(labels_df[labels_df.id == image_id]["breed"])[0]
81         breed_idx = breed2id[breed_name]
82         labels.append(breed_idx)
83
84     ids = ids[:1000]
85     labels = labels[:1000]
86
87     ## Splitting the dataset
88     train_x, valid_x = train_test_split(ids, test_size=0.2, random_state=42)
89     train_y, valid_y = train_test_split(labels, test_size=0.2, random_state=42)
90
91     ## Parameters
92     size = 224
93     num_classes = 120
94     lr = 1e-4
95     batch = 16
96     epochs = 2
97
98     ## Model
99     model = build_model(size, num_classes)
100    model.compile(loss="categorical_crossentropy", optimizer=Adam(lr), metrics=["acc"])
101    # model.summary()
102
103    ## Dataset
104    train_dataset = tf_dataset(train_x, train_y, batch=batch)
105    valid_dataset = tf_dataset(valid_x, valid_y, batch=batch)
106
107    ## Training
108    callbacks = [
109        ModelCheckpoint("model.h5", verbose=1, save_best_only=True),
110        ReduceLROnPlateau(factor=0.1, patience=5, min_lr=1e-6)
111    ]
112    train_steps = (len(train_x)//batch) + 1
113    valid_steps = (len(valid_x)//batch) + 1
114    model.fit(train_dataset,
115              steps_per_epoch=train_steps,
116              validation_steps=valid_steps,
117              validation_data=valid_dataset,
118              epochs=epochs,
119              callbacks=callbacks)
120
```

Test 1

```
2020-09-25 13:00:56.521323: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
Number of Breed: 120
WARNING:tensorflow: `input_shape` is undefined or non-square, or `rows` is not in [96, 128, 160, 192, 224]. Weights for input shape (224, 224) will be loaded as the default.
2020-09-25 13:01:05.150014: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library nvcuda.dll
2020-09-25 13:01:05.169578: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1716] Found device 0 with properties:
pciBusID: 0000:01:00.0 name: GeForce GTX 980 Ti computeCapability: 5.2
coreClock: 1.2405GHz coreCount: 22 deviceMemorySize: 6.00GiB deviceMemoryBandwidth: 313.37GiB/s
2020-09-25 13:01:05.169930: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
2020-09-25 13:01:05.170262: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cUBLAS64_10.dll'; dlerror: cublas64_10.dll not found
2020-09-25 13:01:05.170579: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cuFFT64_10.dll'; dlerror: cufft64_10.dll not found
2020-09-25 13:01:05.170879: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cuRAND64_10.dll'; dlerror: curand64_10.dll not found
2020-09-25 13:01:05.171185: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cuSOLVER64_10.dll'; dlerror: cusolver64_10.dll not found
2020-09-25 13:01:05.171680: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cuSPARSE64_10.dll'; dlerror: cusparse64_10.dll not found
2020-09-25 13:01:05.171985: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cuDNN64_7.dll'; dlerror: cudnn64_7.dll not found
2020-09-25 13:01:05.172156: W tensorflow/core/common_runtime/gpu/gpu_device.cc:1753] Cannot dlopen some GPU libraries. Please make sure the missing libraries mentioned above are installed properly if you
Skipping registering GPU devices...
2020-09-25 13:01:05.172929: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instructions
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
2020-09-25 13:01:05.188067: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x1d931d3f460 initialized for platform Host (this does not guarantee that XLA will be used). Devices:
2020-09-25 13:01:05.188398: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): Host, Default Version
2020-09-25 13:01:05.188703: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1257] Device interconnect StreamExecutor with strength 1 edge matrix:
2020-09-25 13:01:05.188908: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1263]
Epoch 1/2
1/51 [=====>.....] - ETA: 0s - loss: 5.1739 - acc: 0.0000e+00
2/51 [>.....] - ETA: 48s - loss: 5.1255 - acc: 0.0000e+00
3/51 [>.....] - ETA: 1:03 - loss: 5.0265 - acc: 0.0000e+00
4/51 [=>.....] - ETA: 1:09 - loss: 5.0635 - acc: 0.0000e+00
5/51 [=>.....] - ETA: 1:13 - loss: 5.0493 - acc: 0.0000e+00
6/51 [==>.....] - ETA: 1:14 - loss: 5.0339 - acc: 0.0000e+00
7/51 [====>.....] - ETA: 1:14 - loss: 5.0660 - acc: 0.0000e+00
8/51 [====>.....] - ETA: 1:14 - loss: 4.9844 - acc: 0.0078
9/51 [====>.....] - ETA: 1:13 - loss: 4.9952 - acc: 0.0069
10/51 [====>.....] - ETA: 1:12 - loss: 4.9630 - acc: 0.0063
11/51 [====>.....] - ETA: 1:11 - loss: 4.9468 - acc: 0.0057
12/51 [=====>.....] - ETA: 1:10 - loss: 4.9621 - acc: 0.0052
13/51 [=====>.....] - ETA: 1:09 - loss: 4.9735 - acc: 0.0048
14/51 [=====>.....] - ETA: 1:08 - loss: 4.9771 - acc: 0.0045
15/51 [=====>.....] - ETA: 1:06 - loss: 4.9666 - acc: 0.0083
16/51 [=====>.....] - ETA: 1:04 - loss: 4.9647 - acc: 0.0117
17/51 [=====>.....] - ETA: 1:03 - loss: 4.9658 - acc: 0.0110
18/51 [=====>.....] - ETA: 1:01 - loss: 4.9710 - acc: 0.0104
19/51 [=====>.....] - ETA: 59s - loss: 4.9649 - acc: 0.0099
20/51 [=====>.....] - ETA: 58s - loss: 4.9586 - acc: 0.0094
21/51 [=====>.....] - ETA: 56s - loss: 4.9602 - acc: 0.0089
```

Test 1

```
22/51 [=====>.....] - ETA: 54s - loss: 4.9556 - acc: 0.0085
23/51 [=====>.....] - ETA: 53s - loss: 4.9506 - acc: 0.0109
24/51 [=====>.....] - ETA: 51s - loss: 4.9486 - acc: 0.0104
25/51 [=====>.....] - ETA: 49s - loss: 4.9445 - acc: 0.0125
26/51 [=====>.....] - ETA: 47s - loss: 4.9284 - acc: 0.0144
27/51 [=====>.....] - ETA: 45s - loss: 4.9283 - acc: 0.0139
28/51 [=====>.....] - ETA: 43s - loss: 4.9144 - acc: 0.0156
29/51 [=====>.....] - ETA: 42s - loss: 4.9106 - acc: 0.0151
30/51 [=====>.....] - ETA: 40s - loss: 4.9003 - acc: 0.0167
31/51 [=====>.....] - ETA: 38s - loss: 4.8969 - acc: 0.0181
32/51 [=====>.....] - ETA: 36s - loss: 4.8979 - acc: 0.0176
33/51 [=====>.....] - ETA: 34s - loss: 4.8893 - acc: 0.0170
34/51 [=====>.....] - ETA: 32s - loss: 4.8842 - acc: 0.0221
35/51 [=====>.....] - ETA: 30s - loss: 4.8694 - acc: 0.0250
36/51 [=====>.....] - ETA: 28s - loss: 4.8684 - acc: 0.0260
37/51 [=====>.....] - ETA: 27s - loss: 4.8643 - acc: 0.0270
38/51 [=====>.....] - ETA: 25s - loss: 4.8583 - acc: 0.0280
39/51 [=====>.....] - ETA: 23s - loss: 4.8567 - acc: 0.0272
< 40/51 [=====>.....] - ETA: 21s - loss: 4.8464 - acc: 0.0297
< 41/51 [=====>.....] - ETA: 19s - loss: 4.8395 - acc: 0.0290
42/51 [=====>.....] - ETA: 17s - loss: 4.8355 - acc: 0.0298
43/51 [=====>.....] - ETA: 15s - loss: 4.8332 - acc: 0.0320
44/51 [=====>.....] - ETA: 13s - loss: 4.8244 - acc: 0.0327
45/51 [=====>.....] - ETA: 11s - loss: 4.8189 - acc: 0.0319
46/51 [=====>.....] - ETA: 9s - loss: 4.8140 - acc: 0.0326
47/51 [=====>.....] - ETA: 7s - loss: 4.8066 - acc: 0.0332
48/51 [=====>..] - ETA: 5s - loss: 4.7975 - acc: 0.0365
49/51 [=====>..] - ETA: 3s - loss: 4.7925 - acc: 0.0370
50/51 [=====>..] - ETA: 1s - loss: 4.7884 - acc: 0.0375
51/51 [=====] - ETA: 0s - loss: 4.7415 - acc: 0.0564
Epoch 00001: val_loss improved from inf to 4.46624, saving model to model.h5
51/51 [=====] - 104s 2s/step - loss: 4.7415 - acc: 0.0564 - val_loss: 4.4662 - val_acc: 0.0900
Epoch 2/2
1/51 [.....] - ETA: 0s - loss: 2.8423 - acc: 0.8125
2/51 [>.....] - ETA: 47s - loss: 2.9163 - acc: 0.6875
3/51 [>.....] - ETA: 1:02 - loss: 2.9498 - acc: 0.7500
4/51 [=>.....] - ETA: 1:09 - loss: 2.9843 - acc: 0.7656
5/51 [=>.....] - ETA: 1:12 - loss: 2.9981 - acc: 0.7875
6/51 [==>.....] - ETA: 1:13 - loss: 3.0442 - acc: 0.7604
7/51 [==>.....] - ETA: 1:13 - loss: 3.0295 - acc: 0.7500
8/51 [==>.....] - ETA: 1:13 - loss: 3.0486 - acc: 0.7422
9/51 [==>.....] - ETA: 1:13 - loss: 3.0613 - acc: 0.7222
10/51 [==>.....] - ETA: 1:12 - loss: 3.0714 - acc: 0.7063
```

Test 1

```
11/51 [=====>.....] - ETA: 1:11 - loss: 3.0869 - acc: 0.6932
12/51 [=====>.....] - ETA: 1:10 - loss: 3.0805 - acc: 0.7031
13/51 [=====>.....] - ETA: 1:09 - loss: 3.0767 - acc: 0.7067
14/51 [=====>.....] - ETA: 1:07 - loss: 3.0742 - acc: 0.6875
15/51 [=====>.....] - ETA: 1:06 - loss: 3.0754 - acc: 0.6750
16/51 [=====>.....] - ETA: 1:04 - loss: 3.0860 - acc: 0.6719
17/51 [=====>.....] - ETA: 1:03 - loss: 3.1038 - acc: 0.6581
18/51 [=====>.....] - ETA: 1:01 - loss: 3.1109 - acc: 0.6389
19/51 [=====>.....] - ETA: 59s - loss: 3.1108 - acc: 0.6349
20/51 [=====>.....] - ETA: 58s - loss: 3.1185 - acc: 0.6219
21/51 [=====>.....] - ETA: 56s - loss: 3.1247 - acc: 0.6131
22/51 [=====>.....] - ETA: 54s - loss: 3.1328 - acc: 0.6023
23/51 [=====>.....] - ETA: 53s - loss: 3.1413 - acc: 0.5924
24/51 [=====>.....] - ETA: 51s - loss: 3.1389 - acc: 0.5859
25/51 [=====>.....] - ETA: 49s - loss: 3.1272 - acc: 0.5875
26/51 [=====>.....] - ETA: 47s - loss: 3.1409 - acc: 0.5817
27/51 [=====>.....] - ETA: 45s - loss: 3.1239 - acc: 0.5833
28/51 [=====>.....] - ETA: 43s - loss: 3.1312 - acc: 0.5737
29/51 [=====>.....] - ETA: 42s - loss: 3.1267 - acc: 0.5711
30/51 [=====>.....] - ETA: 40s - loss: 3.1206 - acc: 0.5708
< 1/51 [=====>.....] - ETA: 38s - loss: 3.1319 - acc: 0.5585
32/51 [=====>.....] - ETA: 36s - loss: 3.1193 - acc: 0.5625
33/51 [=====>.....] - ETA: 34s - loss: 3.1186 - acc: 0.5568
34/51 [=====>.....] - ETA: 32s - loss: 3.1096 - acc: 0.5588
35/51 [=====>.....] - ETA: 30s - loss: 3.1174 - acc: 0.5536
36/51 [=====>.....] - ETA: 28s - loss: 3.1095 - acc: 0.5538
37/51 [=====>.....] - ETA: 26s - loss: 3.1083 - acc: 0.5490
38/51 [=====>.....] - ETA: 25s - loss: 3.1108 - acc: 0.5444
39/51 [=====>.....] - ETA: 23s - loss: 3.1039 - acc: 0.5417
40/51 [=====>.....] - ETA: 21s - loss: 3.1025 - acc: 0.5375
41/51 [=====>.....] - ETA: 19s - loss: 3.0951 - acc: 0.5366
42/51 [=====>.....] - ETA: 17s - loss: 3.0983 - acc: 0.5327
43/51 [=====>.....] - ETA: 15s - loss: 3.0920 - acc: 0.5334
44/51 [=====>.....] - ETA: 13s - loss: 3.0866 - acc: 0.5327
45/51 [=====>.....] - ETA: 11s - loss: 3.0823 - acc: 0.5333
46/51 [=====>.....] - ETA: 9s - loss: 3.0794 - acc: 0.5299
47/51 [=====>.....] - ETA: 7s - loss: 3.0700 - acc: 0.5319
48/51 [=====>.....] - ETA: 5s - loss: 3.0693 - acc: 0.5299
49/51 [=====>.....] - ETA: 3s - loss: 3.0730 - acc: 0.5255
50/51 [=====>.....] - ETA: 1s - loss: 3.0339 - acc: 0.5350
51/51 [=====] - ETA: 0s - loss: 3.0043 - acc: 0.5441
Epoch 00002: val_loss improved from 4.46624 to 3.99816, saving model to model.h5
51/51 [=====] - 102s 2s/step - loss: 3.0043 - acc: 0.5441 - val_loss: 3.9982 - val_acc: 0.1600
[Finished in 225.57s]
```

Test 1

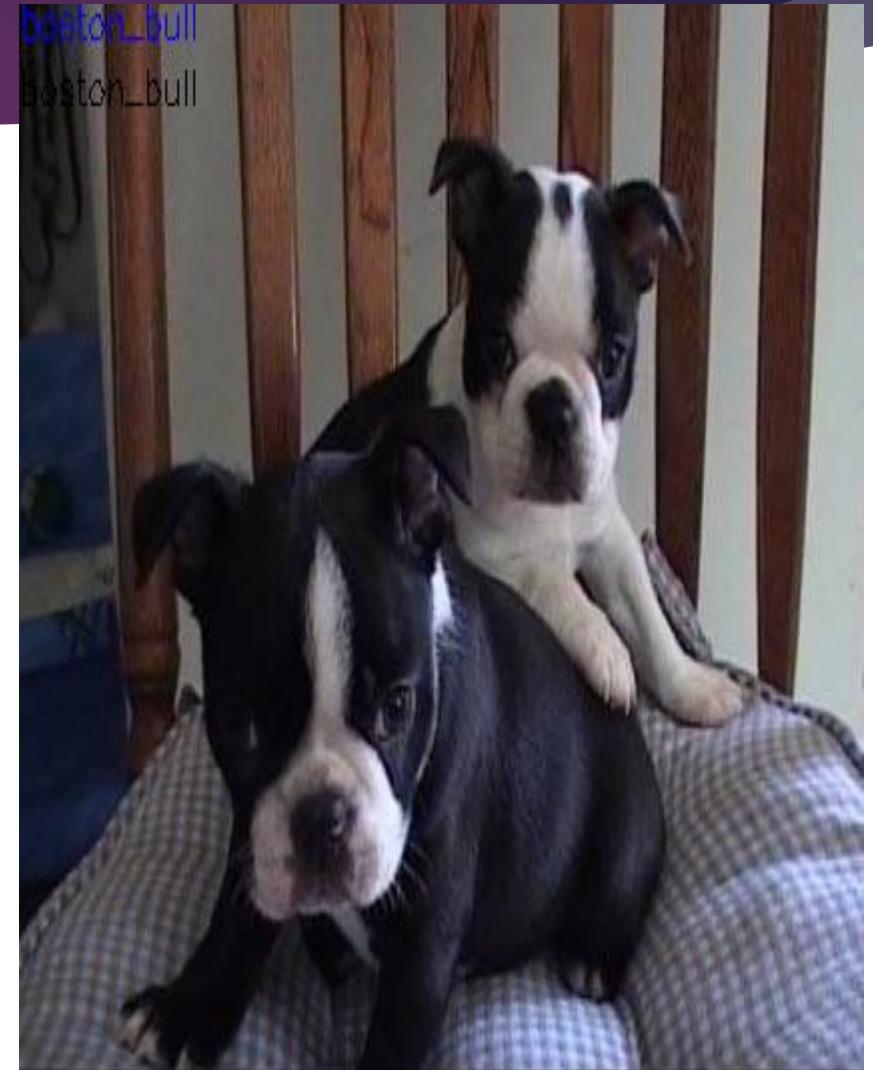
scottish_deerhound
scottish_deerhound



english_setter
english_setter



boston_bull
boston_bull



Test 1

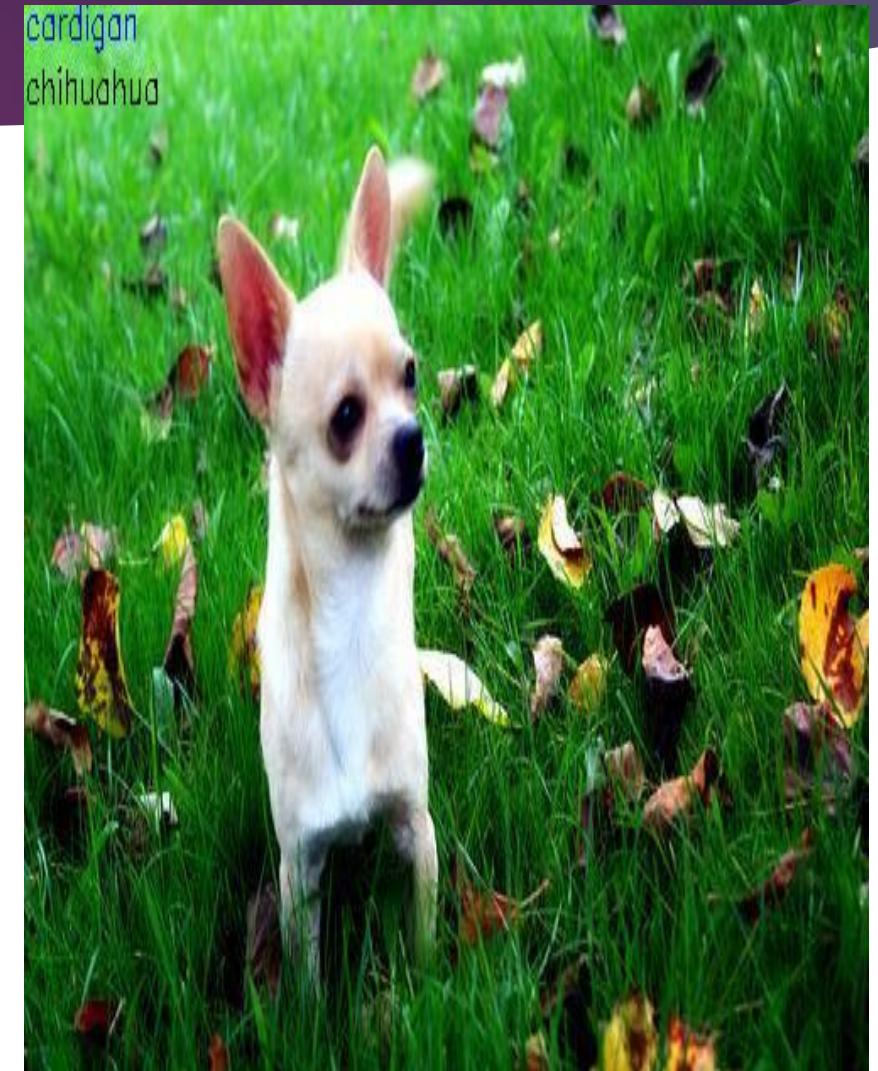
schipperke
irish_setter



newfoundland
irish_water_spaniel



cardigan
chihuahua



Test 2

```
69     labels_df = pd.read_csv(labels_path)
70     breed = labels_df["breed"].unique()
71     print("Number of Breed: ", len(breed))
72
73     breed2id = {name: i for i, name in enumerate(breed)}
74
75     ids = glob(train_path)
76     labels = []
77
78     for image_id in ids:
79         image_id = image_id.split("\\")[-1].split(".")[0]
80         breed_name = list(labels_df[labels_df.id == image_id]["breed"])[0]
81         breed_idx = breed2id[breed_name]
82         labels.append(breed_idx)
83
84     ids = ids[:5000]
85     labels = labels[:5000]
86
87     ## Splitting the dataset
88     train_x, valid_x = train_test_split(ids, test_size=0.2, random_state=42)
89     train_y, valid_y = train_test_split(labels, test_size=0.2, random_state=42)
90
91     ## Parameters
92     size = 224
93     num_classes = 120
94     lr = 1e-4
95     batch = 16
96     epochs = 5
97
98     ## Model
```

Test 2

```
2020-09-26 18:52:40.127102: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
Number of Breed: 120
WARNING:tensorflow:`input_shape` is undefined or non-square, or `rows` is not in [96, 128, 160, 192, 224]. Weights for input shape (224, 224) will be loaded as the default.
2020-09-26 18:52:48.886100: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library nvcuda.dll
2020-09-26 18:52:48.904440: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1716] Found device 0 with properties:
pciBusID: 0000:01:00.0 name: GeForce GTX 980 Ti computeCapability: 5.2
coreClock: 1.2405GHz coreCount: 22 deviceMemorySize: 6.00GiB deviceMemoryBandwidth: 313.37GiB/s
2020-09-26 18:52:48.904796: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
2020-09-26 18:52:48.906069: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cublas64_10.dll'; dlerror: cublas64_10.dll not found
2020-09-26 18:52:48.909731: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cufft64_10.dll
2020-09-26 18:52:48.911214: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library curand64_10.dll
2020-09-26 18:52:48.915234: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cusolver64_10.dll
2020-09-26 18:52:48.917366: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cusparse64_10.dll
2020-09-26 18:52:48.925964: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudnn64_7.dll
2020-09-26 18:52:48.926160: W tensorflow/core/common_runtime/gpu/gpu_device.cc:1753] Cannot dlopen some GPU libraries. Please make sure the missing libraries mentioned above are ins
Skipping registering GPU devices...
2020-09-26 18:52:48.926927: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN)to use the follo
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
```

```
2020-09-26 18:52:48.938683: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x29cfedfe1b0 initialized for platform Host (this does not guarantee that XLA will be used)
2020-09-26 18:52:48.939026: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): Host, Default Version
```

```
2020-09-26 18:52:48.939311: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1257] Device interconnect StreamExecutor with strength 1 edge matrix:
```

```
2020-09-26 18:52:48.939506: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1263]
```

```
Epoch 1/5
```

```
1/251 [........................] - ETA: 0s - loss: 4.9659 - acc: 0.0000e+00
2/251 [........................] - ETA: 4:19 - loss: 4.7582 - acc: 0.0312
3/251 [........................] - ETA: 5:41 - loss: 4.8468 - acc: 0.0208
4/251 [........................] - ETA: 6:17 - loss: 4.9044 - acc: 0.0156
5/251 [........................] - ETA: 6:41 - loss: 4.9715 - acc: 0.0125
6/251 [........................] - ETA: 6:59 - loss: 4.9762 - acc: 0.0104
7/251 [........................] - ETA: 7:09 - loss: 4.9652 - acc: 0.0089
8/251 [........................] - ETA: 7:16 - loss: 4.9776 - acc: 0.0078
9/251 [>........................] - ETA: 7:22 - loss: 4.9754 - acc: 0.0069
10/251 [>........................] - ETA: 7:27 - loss: 4.9731 - acc: 0.0063
11/251 [>........................] - ETA: 7:30 - loss: 4.9651 - acc: 0.0114
12/251 [>........................] - ETA: 7:31 - loss: 4.9688 - acc: 0.0104
13/251 [>........................] - ETA: 7:34 - loss: 4.9713 - acc: 0.0096
14/251 [>........................] - ETA: 7:35 - loss: 4.9423 - acc: 0.0089
```

Test 2

```
238/251 [=====>..] - ETA: 27s - loss: 3.7353 - acc: 0.1970
239/251 [=====>..] - ETA: 25s - loss: 3.7353 - acc: 0.1980
240/251 [=====>..] - ETA: 22s - loss: 3.7305 - acc: 0.1982
241/251 [=====>..] - ETA: 20s - loss: 3.7266 - acc: 0.1984
242/251 [=====>..] - ETA: 18s - loss: 3.7258 - acc: 0.1978
243/251 [=====>..] - ETA: 16s - loss: 3.7191 - acc: 0.1991
244/251 [=====>..] - ETA: 14s - loss: 3.7160 - acc: 0.1990
245/251 [=====>..] - ETA: 12s - loss: 3.7098 - acc: 0.2000
246/251 [=====>..] - ETA: 10s - loss: 3.7040 - acc: 0.2002
247/251 [=====>..] - ETA: 8s - loss: 3.6978 - acc: 0.2009
248/251 [=====>..] - ETA: 6s - loss: 3.6924 - acc: 0.2026
249/251 [=====>..] - ETA: 4s - loss: 3.6878 - acc: 0.2026
250/251 [=====>..] - ETA: 2s - loss: 3.6835 - acc: 0.2027
251/251 [=====] - ETA: 0s - loss: 3.6747 - acc: 0.2049
Epoch 00001: val_loss improved from inf to 2.47832, saving model to model.h5
251/251 [=====] - 539s 2s/step - loss: 3.6747 - acc: 0.2049 - val_loss: 2.4783 - val_acc: 0.3510
Epoch 2/5
1/251 [.....] - ETA: 0s - loss: 1.5056 - acc: 0.6250
2/251 [.....] - ETA: 4:13 - loss: 1.8092 - acc: 0.5625
3/251 [.....] - ETA: 5:43 - loss: 1.9232 - acc: 0.5833
4/251 [.....] - ETA: 6:28 - loss: 1.9189 - acc: 0.5781
5/251 [.....] - ETA: 6:55 - loss: 1.8427 - acc: 0.6000
6/251 [.....] - ETA: 7:25 - loss: 1.7763 - acc: 0.6042
7/251 [.....] - ETA: 7:41 - loss: 1.7981 - acc: 0.5893
8/251 [.....] - ETA: 7:52 - loss: 1.8430 - acc: 0.5781
9/251 [>.....] - ETA: 7:56 - loss: 1.8631 - acc: 0.5694
10/251 [>.....] - ETA: 8:01 - loss: 1.8477 - acc: 0.5750
11/251 [>.....] - ETA: 8:02 - loss: 1.8360 - acc: 0.5795
12/251 [>.....] - ETA: 8:02 - loss: 1.8242 - acc: 0.5781
13/251 [>.....] - ETA: 8:02 - loss: 1.8455 - acc: 0.5721
14/251 [>.....] - ETA: 8:01 - loss: 1.8336 - acc: 0.5714
15/251 [>.....] - ETA: 8:00 - loss: 1.8458 - acc: 0.5625
16/251 [>.....] - ETA: 8:00 - loss: 1.8502 - acc: 0.5625
```

Test 2

```
[=====>..] - ETA: 23s - loss: 1.4008 - acc: 0.6401
241/251 [=====>..] - ETA: 21s - loss: 1.4031 - acc: 0.6393
242/251 [=====>..] - ETA: 19s - loss: 1.4011 - acc: 0.6397
243/251 [=====>..] - ETA: 17s - loss: 1.4006 - acc: 0.6399
244/251 [=====>..] - ETA: 15s - loss: 1.3977 - acc: 0.6406
245/251 [=====>..] - ETA: 12s - loss: 1.3963 - acc: 0.6413
246/251 [=====>..] - ETA: 10s - loss: 1.3934 - acc: 0.6423
247/251 [=====>..] - ETA: 8s - loss: 1.3909 - acc: 0.6427
248/251 [=====>..] - ETA: 6s - loss: 1.3890 - acc: 0.6436
249/251 [=====>..] - ETA: 4s - loss: 1.3874 - acc: 0.6443
250/251 [=====>..] - ETA: 2s - loss: 1.3835 - acc: 0.6457
251/251 [=====] - ETA: 0s - loss: 1.3799 - acc: 0.6469
Epoch 00002: val_loss improved from 2.47832 to 1.81427, saving model to model.h5
251/251 [=====] - 556s 2s/step - loss: 1.3799 - acc: 0.6469 - val_loss: 1.8143 - val_acc: 0.4790
Epoch 3/5
1/251 [.....] - ETA: 0s - loss: 1.1382 - acc: 0.7500
2/251 [.....] - ETA: 4:38 - loss: 0.9742 - acc: 0.8125
3/251 [.....] - ETA: 6:11 - loss: 0.9466 - acc: 0.8125
4/251 [.....] - ETA: 6:57 - loss: 0.8046 - acc: 0.8438
5/251 [.....] - ETA: 7:24 - loss: 0.7252 - acc: 0.8500
6/251 [.....] - ETA: 7:44 - loss: 0.7228 - acc: 0.8438
7/251 [.....] - ETA: 7:53 - loss: 0.7512 - acc: 0.8393
8/251 [.....] - ETA: 7:57 - loss: 0.7501 - acc: 0.8359
9/251 [>.....] - ETA: 8:00 - loss: 0.7480 - acc: 0.8333
10/251 [>.....] - ETA: 8:02 - loss: 0.7351 - acc: 0.8313
11/251 [>.....] - ETA: 8:02 - loss: 0.7096 - acc: 0.8466
12/251 [>.....] - ETA: 8:03 - loss: 0.7265 - acc: 0.8333
13/251 [>.....] - ETA: 8:04 - loss: 0.7333 - acc: 0.8269
14/251 [>.....] - ETA: 8:04 - loss: 0.7321 - acc: 0.8304
```

Test 2

```
233/251 [=====>...] - ETA: 30s - loss: 0.1545 - acc: 0.9917
234/251 [=====>...] - ETA: 36s - loss: 0.1342 - acc: 0.9917
235/251 [=====>...] - ETA: 34s - loss: 0.1339 - acc: 0.9918
236/251 [=====>...] - ETA: 32s - loss: 0.1336 - acc: 0.9918
237/251 [=====>...] - ETA: 30s - loss: 0.1334 - acc: 0.9918
238/251 [=====>...] - ETA: 28s - loss: 0.1333 - acc: 0.9919
239/251 [=====>...] - ETA: 25s - loss: 0.1334 - acc: 0.9919
240/251 [=====>...] - ETA: 23s - loss: 0.1332 - acc: 0.9919
241/251 [=====>...] - ETA: 21s - loss: 0.1332 - acc: 0.9920
242/251 [=====>...] - ETA: 19s - loss: 0.1329 - acc: 0.9920
243/251 [=====>...] - ETA: 17s - loss: 0.1326 - acc: 0.9920
244/251 [=====>...] - ETA: 15s - loss: 0.1326 - acc: 0.9921
245/251 [=====>...] - ETA: 12s - loss: 0.1323 - acc: 0.9921
246/251 [=====>...] - ETA: 10s - loss: 0.1320 - acc: 0.9921
247/251 [=====>...] - ETA: 8s - loss: 0.1317 - acc: 0.9922
248/251 [=====>...] - ETA: 6s - loss: 0.1315 - acc: 0.9922
249/251 [=====>...] - ETA: 4s - loss: 0.1314 - acc: 0.9922
250/251 [=====>...] - ETA: 2s - loss: 0.1312 - acc: 0.9923
251/251 [=====] - ETA: 0s - loss: 0.1308 - acc: 0.9923
Epoch 00004: val_loss improved from 1.59814 to 1.46840, saving model to model.h5
251/251 [=====] - 558s 2s/step - loss: 0.1308 - acc: 0.9923 - val_loss: 1.4684 - val_acc: 0.5830
Epoch 5/5
 1/251 [.....] - ETA: 0s - loss: 0.0703 - acc: 1.0000
 2/251 [.....] - ETA: 4:36 - loss: 0.0553 - acc: 1.0000
 3/251 [.....] - ETA: 6:04 - loss: 0.0533 - acc: 1.0000
 4/251 [.....] - ETA: 6:45 - loss: 0.0524 - acc: 1.0000
 5/251 [.....] - ETA: 7:08 - loss: 0.0505 - acc: 1.0000
 6/251 [.....] - ETA: 7:23 - loss: 0.0534 - acc: 1.0000
 7/251 [.....] - ETA: 7:34 - loss: 0.0550 - acc: 1.0000
 8/251 [.....] - ETA: 7:41 - loss: 0.0565 - acc: 1.0000
 9/251 [>.....] - ETA: 7:47 - loss: 0.0571 - acc: 1.0000
10/251 [>.....] - ETA: 7:51 - loss: 0.0593 - acc: 1.0000
11/251 [>.....] - ETA: 7:54 - loss: 0.0602 - acc: 1.0000
12/251 [>.....] - ETA: 7:56 - loss: 0.0627 - acc: 1.0000
13/251 [>.....] - ETA: 7:57 - loss: 0.0665 - acc: 1.0000
14/251 [>.....] - ETA: 7:59 - loss: 0.0677 - acc: 1.0000
15/251 [>.....] - ETA: 7:59 - loss: 0.0730 - acc: 0.9958
```

Test 2

```
230/251 [=====>...] - ETA: 45s - loss: 0.0506 - acc: 0.9995
231/251 [=====>...] - ETA: 43s - loss: 0.0505 - acc: 0.9995
232/251 [=====>...] - ETA: 41s - loss: 0.0506 - acc: 0.9995
233/251 [=====>...] - ETA: 38s - loss: 0.0505 - acc: 0.9995
234/251 [=====>...] - ETA: 36s - loss: 0.0505 - acc: 0.9995
235/251 [=====>...] - ETA: 34s - loss: 0.0504 - acc: 0.9995
236/251 [=====>...] - ETA: 32s - loss: 0.0504 - acc: 0.9995
237/251 [=====>...] - ETA: 30s - loss: 0.0503 - acc: 0.9995
238/251 [=====>...] - ETA: 28s - loss: 0.0503 - acc: 0.9995
239/251 [=====>...] - ETA: 25s - loss: 0.0503 - acc: 0.9995
240/251 [=====>...] - ETA: 23s - loss: 0.0503 - acc: 0.9995
241/251 [=====>...] - ETA: 21s - loss: 0.0502 - acc: 0.9995
242/251 [=====>...] - ETA: 19s - loss: 0.0502 - acc: 0.9995
243/251 [=====>.] - ETA: 17s - loss: 0.0502 - acc: 0.9995
244/251 [=====>.] - ETA: 15s - loss: 0.0501 - acc: 0.9995
245/251 [=====>.] - ETA: 12s - loss: 0.0501 - acc: 0.9995
246/251 [=====>.] - ETA: 10s - loss: 0.0501 - acc: 0.9995
247/251 [=====>.] - ETA: 8s - loss: 0.0500 - acc: 0.9995
248/251 [=====>.] - ETA: 6s - loss: 0.0499 - acc: 0.9995
249/251 [=====>.] - ETA: 4s - loss: 0.0498 - acc: 0.9995
250/251 [=====>.] - ETA: 2s - loss: 0.0497 - acc: 0.9995
251/251 [=====] - ETA: 0s - loss: 0.0497 - acc: 0.9995
Epoch 00005: val_loss improved from 1.46840 to 1.36209, saving model to model.h5
251/251 [=====] - 558s 2s/step - loss: 0.0497 - acc: 0.9995 - val_loss: 1.3621 - val_acc: 0.6070
[Finished in 2793.335s]
```

Test 2



Test 2

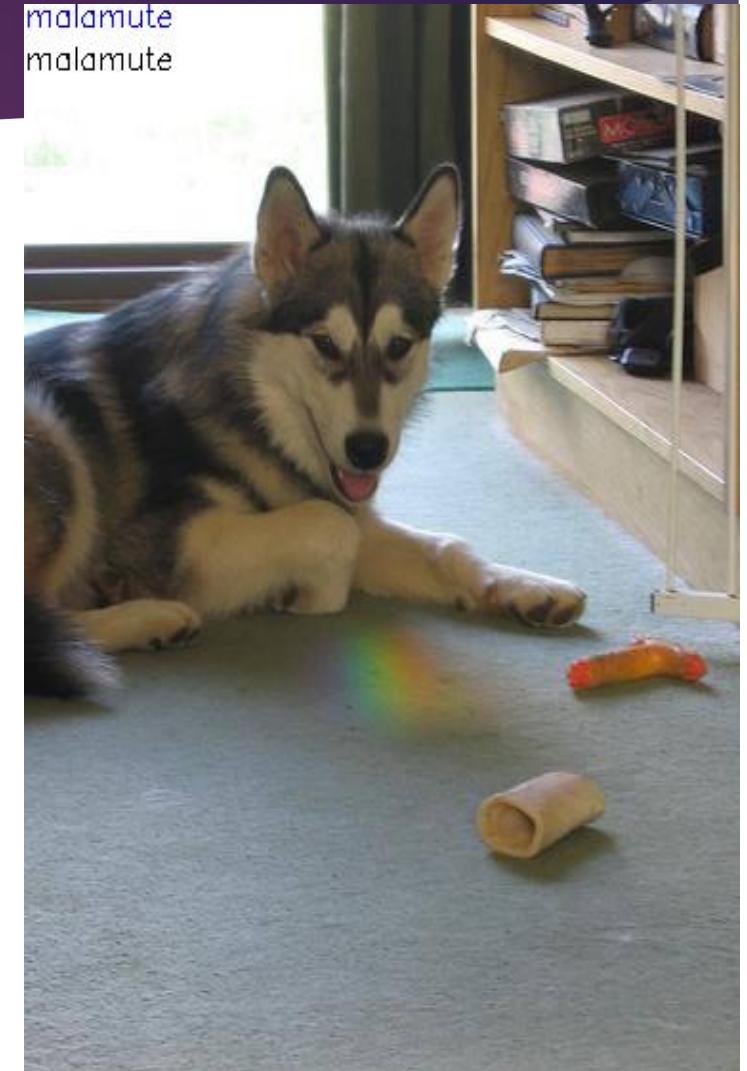
border_collarie
collie



siberian_husky
malamute



malamute
malamute



Test 3

```
90  
91      ## Parameters  
92      size = 224  
93      num_classes = 120  
94      lr = 1e-4  
95      batch = 16  
96      epochs = 10
```

< 7

08

Model

Test 3

```
2020-09-25 13:43:33.655150: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
Number of Breed: 120
WARNING:tensorflow: `input_shape` is undefined or non-square, or `rows` is not in [96, 128, 160, 192, 224]. Weights for input shape (224, 224) will be loaded as the default.
2020-09-25 13:43:42.778964: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library nvcuda.dll
2020-09-25 13:43:42.799335: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1716] Found device 0 with properties:
pciBusID: 0000:01:00.0 name: GeForce GTX 980 Ti computeCapability: 5.2
coreClock: 1.2405GHz coreCount: 22 deviceMemorySize: 6.00GiB deviceMemoryBandwidth: 313.37GiB/s
2020-09-25 13:43:42.799643: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
2020-09-25 13:43:42.800708: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cublas64_10.dll'; dlerror: cublas64_10.dll not found
2020-09-25 13:43:42.801029: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cufft64_10.dll'; dlerror: cufft64_10.dll not found
2020-09-25 13:43:42.801329: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'curand64_10.dll'; dlerror: curand64_10.dll not found
2020-09-25 13:43:42.801629: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cusolver64_10.dll'; dlerror: cusolver64_10.dll not found
2020-09-25 13:43:42.801960: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cusparse64_10.dll'; dlerror: cusparse64_10.dll not found
2020-09-25 13:43:42.802475: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cudnn64_7.dll'; dlerror: cudnn64_7.dll not found
2020-09-25 13:43:42.802649: W tensorflow/core/common_runtime/gpu/gpu_device.cc:1753] Cannot dlopen some GPU libraries. Please make sure the missing libraries mentioned above are installed properly if you
Skipping registering GPU devices...
2020-09-25 13:43:42.803386: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instructions
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.

2020-09-25 13:43:42.818377: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x20786362600 initialized for platform Host (this does not guarantee that XLA will be used). Devices:
2020-09-25 13:43:42.818752: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): Host, Default Version
2020-09-25 13:43:42.819059: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1257] Device interconnect StreamExecutor with strength 1 edge matrix:
2020-09-25 13:43:42.819395: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1263]
Epoch 1/10
1/501 [........................] - ETA: 0s - loss: 5.0826 - acc: 0.0000e+00
2/501 [........................] - ETA: 8:43 - loss: 5.0077 - acc: 0.0000e+00
3/501 [........................] - ETA: 11:36 - loss: 4.9567 - acc: 0.0000e+00
4/501 [........................] - ETA: 13:14 - loss: 4.9383 - acc: 0.0000e+00
5/501 [........................] - ETA: 13:50 - loss: 4.9264 - acc: 0.0000e+00
6/501 [........................] - ETA: 14:12 - loss: 4.9316 - acc: 0.0000e+00
7/501 [........................] - ETA: 14:31 - loss: 4.9031 - acc: 0.0000e+00
8/501 [........................] - ETA: 14:50 - loss: 4.8901 - acc: 0.0000e+00
9/501 [........................] - ETA: 15:05 - loss: 4.8794 - acc: 0.0000e+00
10/501 [........................] - ETA: 15:12 - loss: 4.9012 - acc: 0.0000e+00
11/501 [........................] - ETA: 15:14 - loss: 4.8857 - acc: 0.0000e+00
12/501 [........................] - ETA: 15:16 - loss: 4.8558 - acc: 0.0052
13/501 [........................] - ETA: 15:19 - loss: 4.8672 - acc: 0.0048
14/501 [........................] - ETA: 15:20 - loss: 4.8646 - acc: 0.0045
```

Test 3

```
474/501 [=====>..] - ETA: 52s - loss: 2.8609 - acc: 0.3244
475/501 [=====>..] - ETA: 50s - loss: 2.8585 - acc: 0.3245
476/501 [=====>..] - ETA: 48s - loss: 2.8571 - acc: 0.3247
477/501 [=====>..] - ETA: 46s - loss: 2.8551 - acc: 0.3251
478/501 [=====>..] - ETA: 44s - loss: 2.8524 - acc: 0.3252
479/501 [=====>..] - ETA: 42s - loss: 2.8494 - acc: 0.3258
480/501 [=====>..] - ETA: 40s - loss: 2.8453 - acc: 0.3267
481/501 [=====>..] - ETA: 38s - loss: 2.8447 - acc: 0.3268
482/501 [=====>..] - ETA: 37s - loss: 2.8439 - acc: 0.3269
483/501 [=====>..] - ETA: 35s - loss: 2.8404 - acc: 0.3276
484/501 [=====>..] - ETA: 33s - loss: 2.8372 - acc: 0.3283
485/501 [=====>..] - ETA: 31s - loss: 2.8363 - acc: 0.3282
486/501 [=====>..] - ETA: 29s - loss: 2.8343 - acc: 0.3284
487/501 [=====>..] - ETA: 27s - loss: 2.8319 - acc: 0.3291
488/501 [=====>..] - ETA: 25s - loss: 2.8282 - acc: 0.3298
489/501 [=====>..] - ETA: 23s - loss: 2.8249 - acc: 0.3306
490/501 [=====>..] - ETA: 21s - loss: 2.8234 - acc: 0.3307
491/501 [=====>..] - ETA: 19s - loss: 2.8218 - acc: 0.3311
492/501 [=====>..] - ETA: 17s - loss: 2.8201 - acc: 0.3313
493/501 [=====>..] - ETA: 15s - loss: 2.8180 - acc: 0.3318
494/501 [=====>..] - ETA: 13s - loss: 2.8152 - acc: 0.3322
495/501 [=====>..] - ETA: 11s - loss: 2.8131 - acc: 0.3326
496/501 [=====>..] - ETA: 9s - loss: 2.8109 - acc: 0.3328
497/501 [=====>..] - ETA: 7s - loss: 2.8089 - acc: 0.3330
498/501 [=====>..] - ETA: 5s - loss: 2.8065 - acc: 0.3333
499/501 [=====>..] - ETA: 3s - loss: 2.8047 - acc: 0.3338
500/501 [=====>..] - ETA: 1s - loss: 2.8015 - acc: 0.3344
501/501 [=====] - ETA: 0s - loss: 2.7987 - acc: 0.3350
Epoch 00001: val_loss improved from inf to 1.75029, saving model to model.h5
501/501 [=====] - 1011s 2s/step - loss: 2.7987 - acc: 0.3350 - val_loss: 1.7503 - val_acc: 0.4807
Epoch 2/10
1/501 [.....] - ETA: 0s - loss: 1.2353 - acc: 0.6875
2/501 [.....] - ETA: 7:48 - loss: 1.4209 - acc: 0.5938
3/501 [.....] - ETA: 10:25 - loss: 1.2991 - acc: 0.6458
4/501 [.....] - ETA: 11:43 - loss: 1.3697 - acc: 0.6406
5/501 [.....] - ETA: 12:26 - loss: 1.3298 - acc: 0.6375
6/501 [.....] - ETA: 12:57 - loss: 1.3251 - acc: 0.6250
```

Test 3

```
489/501 [=====>.] - ETA: 22s - loss: 0.9973 - acc: 0.7143
490/501 [=====>.] - ETA: 20s - loss: 0.9970 - acc: 0.7144
491/501 [=====>.] - ETA: 18s - loss: 0.9959 - acc: 0.7147
492/501 [=====>.] - ETA: 16s - loss: 0.9958 - acc: 0.7148
493/501 [=====>.] - ETA: 14s - loss: 0.9947 - acc: 0.7154
494/501 [=====>.] - ETA: 12s - loss: 0.9936 - acc: 0.7158
495/501 [=====>.] - ETA: 11s - loss: 0.9929 - acc: 0.7160
496/501 [=====>.] - ETA: 9s - loss: 0.9924 - acc: 0.7159
497/501 [=====>.] - ETA: 7s - loss: 0.9916 - acc: 0.7162
498/501 [=====>.] - ETA: 5s - loss: 0.9911 - acc: 0.7161
499/501 [=====>.] - ETA: 3s - loss: 0.9902 - acc: 0.7164
500/501 [=====>.] - ETA: 1s - loss: 0.9899 - acc: 0.7166
501/501 [=====] - ETA: 0s - loss: 0.9887 - acc: 0.7169
Epoch 00002: val_loss improved from 1.75029 to 1.30063, saving model to model.h5
501/501 [=====] - 955s 2s/step - loss: 0.9887 - acc: 0.7169 - val_loss: 1.3006 - val_acc: 0.6101
Epoch 3/10
 1/501 [.....] - ETA: 0s - loss: 0.7480 - acc: 0.8125
 2/501 [.....] - ETA: 7:42 - loss: 0.4875 - acc: 0.9062
 3/501 [.....] - ETA: 10:12 - loss: 0.5298 - acc: 0.8958
 4/501 [.....] - ETA: 11:31 - loss: 0.5247 - acc: 0.8906
 5/501 [.....] - ETA: 12:17 - loss: 0.5080 - acc: 0.9000
 6/501 [.....] - ETA: 12:47 - loss: 0.4969 - acc: 0.8854
 7/501 [.....] - ETA: 13:10 - loss: 0.5248 - acc: 0.8750
 8/501 [.....] - ETA: 13:30 - loss: 0.5146 - acc: 0.8672
 9/501 [.....] - ETA: 13:39 - loss: 0.5822 - acc: 0.8403
10/501 [.....] - ETA: 13:45 - loss: 0.5686 - acc: 0.8500
11/501 [.....] - ETA: 13:52 - loss: 0.5542 - acc: 0.8523
12/501 [.....] - ETA: 13:59 - loss: 0.5643 - acc: 0.8333
13/501 [.....] - ETA: 14:01 - loss: 0.5681 - acc: 0.8365
14/501 [.....] - ETA: 14:05 - loss: 0.5586 - acc: 0.8393
15/501 [.....] - ETA: 14:08 - loss: 0.5719 - acc: 0.8375
16/501 [.....] - ETA: 14:10 - loss: 0.5599 - acc: 0.8438
17/501 [>.....] - ETA: 14:11 - loss: 0.5499 - acc: 0.8529
18/501 [>.....] - ETA: 14:13 - loss: 0.5665 - acc: 0.8472
19/501 [>.....] - ETA: 14:14 - loss: 0.5592 - acc: 0.8487
20/501 [>.....] - ETA: 14:15 - loss: 0.5668 - acc: 0.8500
21/501 [>.....] - ETA: 14:16 - loss: 0.5774 - acc: 0.8452
```

Test 3

```
495/501 [=====>.] - ETA: 11s - loss: 0.3445 - acc: 0.9222
496/501 [=====>.] - ETA: 9s - loss: 0.3441 - acc: 0.9224
497/501 [=====>.] - ETA: 7s - loss: 0.3440 - acc: 0.9223
498/501 [=====>.] - ETA: 5s - loss: 0.3436 - acc: 0.9224
499/501 [=====>.] - ETA: 3s - loss: 0.3434 - acc: 0.9225
500/501 [=====>.] - ETA: 1s - loss: 0.3431 - acc: 0.9226
501/501 [=====] - ETA: 0s - loss: 0.3432 - acc: 0.9225
Epoch 00003: val_loss improved from 1.30063 to 1.22361, saving model to model.h5
501/501 [=====] - 957s 2s/step - loss: 0.3432 - acc: 0.9225 - val_loss: 1.2236 - val_acc: 0.6319
Epoch 4/10
1/501 [.....] - ETA: 0s - loss: 0.0690 - acc: 1.0000
2/501 [.....] - ETA: 7:38 - loss: 0.1093 - acc: 1.0000
3/501 [.....] - ETA: 10:10 - loss: 0.1418 - acc: 1.0000
4/501 [.....] - ETA: 11:30 - loss: 0.1263 - acc: 1.0000
5/501 [.....] - ETA: 12:17 - loss: 0.1161 - acc: 1.0000
6/501 [.....] - ETA: 12:46 - loss: 0.1501 - acc: 0.9792
7/501 [.....] - ETA: 13:09 - loss: 0.1518 - acc: 0.9821
8/501 [.....] - ETA: 13:25 - loss: 0.1703 - acc: 0.9688
9/501 [.....] - ETA: 13:39 - loss: 0.1713 - acc: 0.9722
10/501 [.....] - ETA: 13:45 - loss: 0.1734 - acc: 0.9750
11/501 [.....] - ETA: 13:51 - loss: 0.1976 - acc: 0.9716
12/501 [.....] - ETA: 13:56 - loss: 0.1946 - acc: 0.9688
13/501 [.....] - ETA: 14:02 - loss: 0.1889 - acc: 0.9712
14/501 [.....] - ETA: 14:05 - loss: 0.1995 - acc: 0.9643
15/501 [.....] - ETA: 14:09 - loss: 0.1946 - acc: 0.9667
16/501 [.....] - ETA: 14:11 - loss: 0.1924 - acc: 0.9688
17/501 [>.....] - ETA: 14:13 - loss: 0.1927 - acc: 0.9706
18/501 [>.....] - ETA: 14:14 - loss: 0.1893 - acc: 0.9722
19/501 [>.....] - ETA: 14:15 - loss: 0.1920 - acc: 0.9704
20/501 [>.....] - ETA: 14:16 - loss: 0.1913 - acc: 0.9719
21/501 [>.....] - ETA: 14:17 - loss: 0.1979 - acc: 0.9673
22/501 [>.....] - ETA: 14:17 - loss: 0.1937 - acc: 0.9688
23/501 [>.....] - ETA: 14:17 - loss: 0.1888 - acc: 0.9701
24/501 [>.....] - ETA: 14:17 - loss: 0.1831 - acc: 0.9714
25/501 [>.....] - ETA: 14:16 - loss: 0.1842 - acc: 0.9700
26/501 [>.....] - ETA: 14:15 - loss: 0.1811 - acc: 0.9712
27/501 [>.....] - ETA: 14:15 - loss: 0.1802 - acc: 0.9722
-----
```

Test 3

```
478/501 [=====>..] - ETA: 42s - loss: 0.0419 - acc: 0.9974
479/501 [=====>..] - ETA: 40s - loss: 0.0418 - acc: 0.9974
480/501 [=====>..] - ETA: 38s - loss: 0.0418 - acc: 0.9974
481/501 [=====>..] - ETA: 37s - loss: 0.0418 - acc: 0.9974
482/501 [=====>..] - ETA: 35s - loss: 0.0418 - acc: 0.9974
483/501 [=====>..] - ETA: 33s - loss: 0.0418 - acc: 0.9974
484/501 [=====>..] - ETA: 31s - loss: 0.0417 - acc: 0.9974
485/501 [=====>..] - ETA: 29s - loss: 0.0416 - acc: 0.9974
486/501 [=====>..] - ETA: 27s - loss: 0.0416 - acc: 0.9974
487/501 [=====>..] - ETA: 25s - loss: 0.0416 - acc: 0.9974
488/501 [=====>..] - ETA: 24s - loss: 0.0415 - acc: 0.9974
489/501 [=====>..] - ETA: 22s - loss: 0.0415 - acc: 0.9974
490/501 [=====>..] - ETA: 20s - loss: 0.0415 - acc: 0.9974
< 491/501 [=====>..] - ETA: 18s - loss: 0.0414 - acc: 0.9975
492/501 [=====>..] - ETA: 16s - loss: 0.0413 - acc: 0.9975
493/501 [=====>..] - ETA: 14s - loss: 0.0413 - acc: 0.9975
494/501 [=====>..] - ETA: 13s - loss: 0.0413 - acc: 0.9975
495/501 [=====>..] - ETA: 11s - loss: 0.0413 - acc: 0.9975
496/501 [=====>..] - ETA: 9s - loss: 0.0412 - acc: 0.9975
497/501 [=====>..] - ETA: 7s - loss: 0.0412 - acc: 0.9975
498/501 [=====>..] - ETA: 5s - loss: 0.0411 - acc: 0.9975
499/501 [=====>..] - ETA: 3s - loss: 0.0411 - acc: 0.9975
500/501 [=====>..] - ETA: 1s - loss: 0.0410 - acc: 0.9975
501/501 [=====] - ETA: 0s - loss: 0.0410 - acc: 0.9975
Epoch 00005: val_loss improved from 1.15738 to 1.08585, saving model to model.h5
501/501 [=====] - 957s 2s/step - loss: 0.0410 - acc: 0.9975 - val_loss: 1.0859 - val_acc: 0.6835
Epoch 6/10
 1/501 [.....] - ETA: 0s - loss: 0.0142 - acc: 1.0000
 2/501 [.....] - ETA: 7:45 - loss: 0.0167 - acc: 1.0000
 3/501 [.....] - ETA: 10:24 - loss: 0.0160 - acc: 1.0000
 4/501 [.....] - ETA: 11:41 - loss: 0.0163 - acc: 1.0000
 5/501 [.....] - ETA: 12:29 - loss: 0.0170 - acc: 1.0000
 6/501 [.....] - ETA: 12:58 - loss: 0.0166 - acc: 1.0000
 7/501 [.....] - ETA: 13:20 - loss: 0.0192 - acc: 1.0000
 8/501 [.....] - ETA: 13:34 - loss: 0.0188 - acc: 1.0000
 9/501 [.....] - ETA: 13:45 - loss: 0.0214 - acc: 1.0000
10/501 [.....] - ETA: 13:53 - loss: 0.0203 - acc: 1.0000
11/501 [.....]
```

Test 3

```
494/501 [=====>.] - ETA: 13s - loss: 0.0180 - acc: 0.9995
495/501 [=====>.] - ETA: 11s - loss: 0.0180 - acc: 0.9995
496/501 [=====>.] - ETA: 9s - loss: 0.0180 - acc: 0.9995
497/501 [=====>.] - ETA: 7s - loss: 0.0180 - acc: 0.9995
498/501 [=====>.] - ETA: 5s - loss: 0.0180 - acc: 0.9995
499/501 [=====>.] - ETA: 3s - loss: 0.0180 - acc: 0.9995
500/501 [=====>.] - ETA: 1s - loss: 0.0180 - acc: 0.9995
501/501 [=====] - ETA: 0s - loss: 0.0180 - acc: 0.9995
Epoch 00006: val_loss did not improve from 1.08585
501/501 [=====] - 958s 2s/step - loss: 0.0180 - acc: 0.9995 - val_loss: 1.1242 - val_acc: 0.6905
Epoch 7/10
1/501 [.....] - ETA: 0s - loss: 0.0053 - acc: 1.0000
2/501 [.....] - ETA: 7:39 - loss: 0.0087 - acc: 1.0000
3/501 [.....] - ETA: 10:18 - loss: 0.0079 - acc: 1.0000
4/501 [.....] - ETA: 11:42 - loss: 0.0074 - acc: 1.0000
5/501 [.....] - ETA: 12:25 - loss: 0.0084 - acc: 1.0000
6/501 [.....] - ETA: 12:55 - loss: 0.0089 - acc: 1.0000
7/501 [.....] - ETA: 13:15 - loss: 0.0088 - acc: 1.0000
8/501 [.....] - ETA: 13:28 - loss: 0.0096 - acc: 1.0000
9/501 [.....] - ETA: 13:39 - loss: 0.0099 - acc: 1.0000
10/501 [.....] - ETA: 13:44 - loss: 0.0103 - acc: 1.0000
11/501 [.....] - ETA: 13:52 - loss: 0.0111 - acc: 1.0000
12/501 [.....] - ETA: 13:57 - loss: 0.0109 - acc: 1.0000
13/501 [.....] - ETA: 14:03 - loss: 0.0121 - acc: 1.0000
14/501 [.....] - ETA: 14:06 - loss: 0.0119 - acc: 1.0000
15/501 [.....] - ETA: 14:09 - loss: 0.0118 - acc: 1.0000
16/501 [.....] - ETA: 14:12 - loss: 0.0120 - acc: 1.0000
17/501 [>.....] - ETA: 14:15 - loss: 0.0118 - acc: 1.0000
18/501 [>.....] - ETA: 14:17 - loss: 0.0118 - acc: 1.0000
19/501 [>.....] - ETA: 14:18 - loss: 0.0117 - acc: 1.0000
20/501 [>.....] - ETA: 14:19 - loss: 0.0114 - acc: 1.0000
21/501 [>.....] - ETA: 14:20 - loss: 0.0114 - acc: 1.0000
22/501 [>.....] - ETA: 14:21 - loss: 0.0114 - acc: 1.0000
23/501 [>.....] - ETA: 14:20 - loss: 0.0113 - acc: 1.0000
24/501 [>.....] - ETA: 14:20 - loss: 0.0111 - acc: 1.0000
25/501 [>.....] - ETA: 14:20 - loss: 0.0110 - acc: 1.0000
26/501 [>.....] - ETA: 14:19 - loss: 0.0107 - acc: 1.0000
27/501 [>.....] - ETA: 14:18 - loss: 0.0108 - acc: 1.0000
```

Test 3

```
491/501 [=====>.] - ETA: 18s - loss: 0.0171 - acc: 0.9982
492/501 [=====>.] - ETA: 16s - loss: 0.0170 - acc: 0.9982
493/501 [=====>.] - ETA: 14s - loss: 0.0171 - acc: 0.9982
494/501 [=====>.] - ETA: 13s - loss: 0.0171 - acc: 0.9982
495/501 [=====>.] - ETA: 11s - loss: 0.0172 - acc: 0.9981
496/501 [=====>.] - ETA: 9s - loss: 0.0172 - acc: 0.9981
497/501 [=====>.] - ETA: 7s - loss: 0.0172 - acc: 0.9981
498/501 [=====>.] - ETA: 5s - loss: 0.0172 - acc: 0.9981
499/501 [=====>.] - ETA: 3s - loss: 0.0172 - acc: 0.9981
500/501 [=====>.] - ETA: 1s - loss: 0.0172 - acc: 0.9981
501/501 [=====] - ETA: 0s - loss: 0.0172 - acc: 0.9981
Epoch 00007: val_loss did not improve from 1.08585

01/501 [=====] - 957s 2s/step - loss: 0.0172 - acc: 0.9981 - val_loss: 1.3059 - val_acc: 0.6548
Epoch 8/10
1/501 [.....] - ETA: 0s - loss: 0.0145 - acc: 1.0000
2/501 [.....] - ETA: 7:42 - loss: 0.0846 - acc: 0.9688
3/501 [.....] - ETA: 10:15 - loss: 0.0624 - acc: 0.9792
4/501 [.....] - ETA: 11:30 - loss: 0.0559 - acc: 0.9844
5/501 [.....] - ETA: 12:12 - loss: 0.0484 - acc: 0.9875
6/501 [.....] - ETA: 12:41 - loss: 0.0428 - acc: 0.9896
7/501 [.....] - ETA: 13:01 - loss: 0.0452 - acc: 0.9911
8/501 [.....] - ETA: 13:19 - loss: 0.0408 - acc: 0.9922
9/501 [.....] - ETA: 13:32 - loss: 0.0410 - acc: 0.9931
10/501 [.....] - ETA: 13:40 - loss: 0.0409 - acc: 0.9937
11/501 [.....] - ETA: 13:49 - loss: 0.0443 - acc: 0.9886
12/501 [.....] - ETA: 13:54 - loss: 0.0422 - acc: 0.9896
13/501 [.....] - ETA: 13:59 - loss: 0.0418 - acc: 0.9904
14/501 [.....] - ETA: 14:02 - loss: 0.0445 - acc: 0.9911
15/501 [.....] - ETA: 14:05 - loss: 0.0438 - acc: 0.9917
16/501 [.....] - ETA: 14:08 - loss: 0.0419 - acc: 0.9922
17/501 [>.....] - ETA: 14:09 - loss: 0.0406 - acc: 0.9926
18/501 [>.....] - ETA: 14:10 - loss: 0.0386 - acc: 0.9931
19/501 [>.....] - ETA: 14:12 - loss: 0.0375 - acc: 0.9934
20/501 [>.....] - ETA: 14:13 - loss: 0.0367 - acc: 0.9937
21/501 [>.....] - ETA: 14:14 - loss: 0.0360 - acc: 0.9940
22/501 [>.....] - ETA: 14:15 - loss: 0.0373 - acc: 0.9943
```

Test 3

```
491/501 [=====>.] - ETA: 18s - loss: 0.1325 - acc: 0.9640
492/501 [=====>.] - ETA: 16s - loss: 0.1329 - acc: 0.9639
493/501 [=====>.] - ETA: 14s - loss: 0.1335 - acc: 0.9637
494/501 [=====>.] - ETA: 13s - loss: 0.1345 - acc: 0.9636
495/501 [=====>.] - ETA: 11s - loss: 0.1354 - acc: 0.9633
496/501 [=====>.] - ETA: 9s - loss: 0.1364 - acc: 0.9628
497/501 [=====>.] - ETA: 7s - loss: 0.1366 - acc: 0.9628
498/501 [=====>.] - ETA: 5s - loss: 0.1371 - acc: 0.9625
499/501 [=====>.] - ETA: 3s - loss: 0.1374 - acc: 0.9624
500/501 [=====>.] - ETA: 1s - loss: 0.1375 - acc: 0.9624
501/501 [=====] - ETA: 0s - loss: 0.1379 - acc: 0.9621
Epoch 00008: val_loss did not improve from 1.08585

: 01/501 [=====] - 962s 2s/step - loss: 0.1379 - acc: 0.9621 - val_loss: 2.5432 - val_acc: 0.4960
Epoch 9/10
1/501 [.....] - ETA: 0s - loss: 0.2841 - acc: 0.9375
2/501 [.....] - ETA: 7:43 - loss: 0.4460 - acc: 0.8750
3/501 [.....] - ETA: 10:15 - loss: 0.4542 - acc: 0.8542
4/501 [.....] - ETA: 11:47 - loss: 0.4544 - acc: 0.8594
5/501 [.....] - ETA: 12:26 - loss: 0.4639 - acc: 0.8750
6/501 [.....] - ETA: 12:53 - loss: 0.4953 - acc: 0.8750
7/501 [.....] - ETA: 13:19 - loss: 0.4939 - acc: 0.8661
8/501 [.....] - ETA: 13:37 - loss: 0.4684 - acc: 0.8750
9/501 [.....] - ETA: 13:46 - loss: 0.4782 - acc: 0.8750
10/501 [.....] - ETA: 13:53 - loss: 0.5127 - acc: 0.8687
11/501 [.....] - ETA: 14:00 - loss: 0.5035 - acc: 0.8693
12/501 [.....] - ETA: 14:07 - loss: 0.4863 - acc: 0.8750
13/501 [.....] - ETA: 14:11 - loss: 0.5485 - acc: 0.8702
14/501 [.....] - ETA: 14:13 - loss: 0.5296 - acc: 0.8750
15/501 [.....] - ETA: 14:16 - loss: 0.5528 - acc: 0.8625
16/501 [.....] - ETA: 14:20 - loss: 0.5727 - acc: 0.8594
17/501 [>.....] - ETA: 14:23 - loss: 0.5723 - acc: 0.8566
18/501 [>.....] - ETA: 14:24 - loss: 0.5651 - acc: 0.8576
19/501 [>.....] - ETA: 14:25 - loss: 0.5428 - acc: 0.8651
20/501 [>.....] - ETA: 14:25 - loss: 0.5275 - acc: 0.8656
21/501 [>.....] - ETA: 14:26 - loss: 0.5066 - acc: 0.8690
22/501 [>.....] - ETA: 14:27 - loss: 0.4856 - acc: 0.8750
```

Test 3

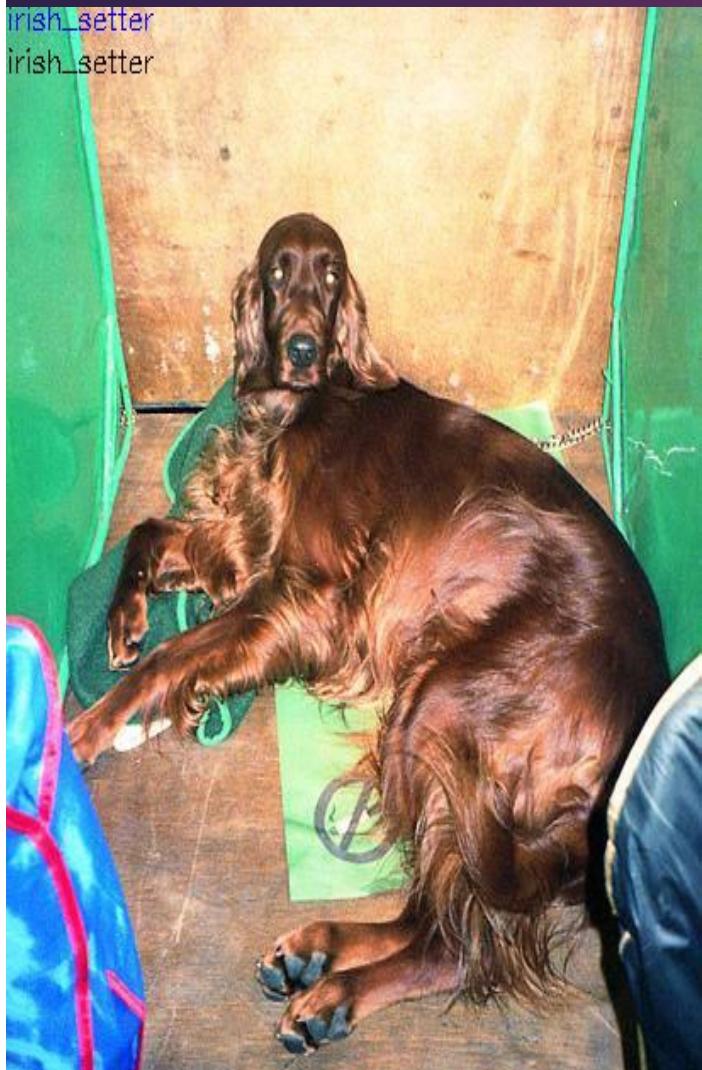
```
Python - train.py:96 ✓
477/501 [=====>..] - ETA: 45s - loss: 0.2396 - acc: 0.9266
478/501 [=====>..] - ETA: 43s - loss: 0.2391 - acc: 0.9268
479/501 [=====>..] - ETA: 41s - loss: 0.2391 - acc: 0.9268
480/501 [=====>..] - ETA: 39s - loss: 0.2387 - acc: 0.9270
481/501 [=====>..] - ETA: 37s - loss: 0.2383 - acc: 0.9271
482/501 [=====>..] - ETA: 35s - loss: 0.2379 - acc: 0.9273
483/501 [=====>..] - ETA: 33s - loss: 0.2378 - acc: 0.9273
484/501 [=====>..] - ETA: 32s - loss: 0.2373 - acc: 0.9274
485/501 [=====>..] - ETA: 30s - loss: 0.2370 - acc: 0.9276
486/501 [=====>..] - ETA: 28s - loss: 0.2372 - acc: 0.9276
487/501 [=====>..] - ETA: 26s - loss: 0.2368 - acc: 0.9277
488/501 [=====>..] - ETA: 24s - loss: 0.2368 - acc: 0.9278
489/501 [=====>..] - ETA: 22s - loss: 0.2364 - acc: 0.9279
490/501 [=====>..] - ETA: 20s - loss: 0.2360 - acc: 0.9281
491/501 [=====>..] - ETA: 18s - loss: 0.2356 - acc: 0.9282
492/501 [=====>..] - ETA: 16s - loss: 0.2352 - acc: 0.9284
493/501 [=====>..] - ETA: 15s - loss: 0.2349 - acc: 0.9284
494/501 [=====>..] - ETA: 13s - loss: 0.2349 - acc: 0.9284
495/501 [=====>..] - ETA: 11s - loss: 0.2349 - acc: 0.9283
496/501 [=====>..] - ETA: 9s - loss: 0.2345 - acc: 0.9284
497/501 [=====>..] - ETA: 7s - loss: 0.2341 - acc: 0.9286
498/501 [=====>..] - ETA: 5s - loss: 0.2340 - acc: 0.9286
499/501 [=====>..] - ETA: 3s - loss: 0.2341 - acc: 0.9286
500/501 [=====>..] - ETA: 1s - loss: 0.2340 - acc: 0.9286
501/501 [=====] - ETA: 0s - loss: 0.2344 - acc: 0.9283
Epoch 00009: val_loss did not improve from 1.08585
501/501 [=====] - 972s 2s/step - loss: 0.2344 - acc: 0.9283 - val_loss: 1.6999 - val_acc: 0.5997
Epoch 10/10
1/501 [.....] - ETA: 0s - loss: 0.1850 - acc: 0.9375
2/501 [.....] - ETA: 7:35 - loss: 0.2098 - acc: 0.9062
3/501 [.....] - ETA: 10:20 - loss: 0.1459 - acc: 0.9375
4/501 [.....] - ETA: 11:34 - loss: 0.1166 - acc: 0.9531
5/501 [.....] - ETA: 12:22 - loss: 0.1592 - acc: 0.9250
6/501 [.....] - ETA: 12:53 - loss: 0.1554 - acc: 0.9375
7/501 [.....] - ETA: 13:12 - loss: 0.1405 - acc: 0.9464
8/501 [.....] - ETA: 13:27 - loss: 0.1439 - acc: 0.9375
9/501 [.....] - ETA: 13:44 - loss: 0.1337 - acc: 0.9444
```

Test 3

```
Python - train.py:96 ✓
468/501 [=====>..] - ETA: 1:01 - loss: 0.0799 - acc: 0.9793
469/501 [=====>..] - ETA: 59s - loss: 0.0798 - acc: 0.9793
470/501 [=====>..] - ETA: 57s - loss: 0.0798 - acc: 0.9793
471/501 [=====>..] - ETA: 55s - loss: 0.0796 - acc: 0.9793
472/501 [=====>..] - ETA: 54s - loss: 0.0795 - acc: 0.9793
473/501 [=====>..] - ETA: 52s - loss: 0.0797 - acc: 0.9793
474/501 [=====>..] - ETA: 50s - loss: 0.0798 - acc: 0.9793
475/501 [=====>..] - ETA: 48s - loss: 0.0796 - acc: 0.9793
476/501 [=====>..] - ETA: 46s - loss: 0.0796 - acc: 0.9794
477/501 [=====>..] - ETA: 44s - loss: 0.0795 - acc: 0.9794
478/501 [=====>..] - ETA: 42s - loss: 0.0793 - acc: 0.9795
479/501 [=====>..] - ETA: 41s - loss: 0.0793 - acc: 0.9795
480/501 [=====>..] - ETA: 39s - loss: 0.0791 - acc: 0.9796
< 81/501 [=====>..] - ETA: 37s - loss: 0.0792 - acc: 0.9796
482/501 [=====>..] - ETA: 35s - loss: 0.0790 - acc: 0.9796
483/501 [=====>..] - ETA: 33s - loss: 0.0789 - acc: 0.9797
484/501 [=====>..] - ETA: 31s - loss: 0.0789 - acc: 0.9797
485/501 [=====>..] - ETA: 29s - loss: 0.0788 - acc: 0.9798
486/501 [=====>..] - ETA: 27s - loss: 0.0787 - acc: 0.9798
487/501 [=====>..] - ETA: 26s - loss: 0.0786 - acc: 0.9799
488/501 [=====>..] - ETA: 24s - loss: 0.0785 - acc: 0.9799
489/501 [=====>..] - ETA: 22s - loss: 0.0784 - acc: 0.9799
490/501 [=====>..] - ETA: 20s - loss: 0.0782 - acc: 0.9800
491/501 [=====>..] - ETA: 18s - loss: 0.0781 - acc: 0.9800
492/501 [=====>..] - ETA: 16s - loss: 0.0780 - acc: 0.9801
493/501 [=====>..] - ETA: 14s - loss: 0.0778 - acc: 0.9801
494/501 [=====>..] - ETA: 13s - loss: 0.0778 - acc: 0.9800
495/501 [=====>..] - ETA: 11s - loss: 0.0777 - acc: 0.9801
496/501 [=====>..] - ETA: 9s - loss: 0.0776 - acc: 0.9801
497/501 [=====>..] - ETA: 7s - loss: 0.0775 - acc: 0.9801
498/501 [=====>..] - ETA: 5s - loss: 0.0774 - acc: 0.9802
499/501 [=====>..] - ETA: 3s - loss: 0.0773 - acc: 0.9802
500/501 [=====>..] - ETA: 1s - loss: 0.0772 - acc: 0.9803
501/501 [=====] - ETA: 0s - loss: 0.0770 - acc: 0.9803
Epoch 00010: val_loss did not improve from 1.08585
501/501 [=====] - 962s 2s/step - loss: 0.0770 - acc: 0.9803 - val_loss: 1.6527 - val_acc: 0.6339
[Finished in 9684.335s]
```

Test 3

irish_setter
irish_setter



papillon
papillon



keeshond
keeshond



Test 3

border_collar
collie



old_english_sheepdog
toy_poodle



great_pyrenees
samoyed



Test 4

```
2020-09-26 13:55:56.045895: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
Number of Breed: 120
WARNING:tensorflow: `input_shape` is undefined or non-square, or `rows` is not in [96, 128, 160, 192, 224]. Weights for input shape (224, 224) will be loaded as the default.
2020-09-26 13:56:06.512721: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library nvcuda.dll
2020-09-26 13:56:06.650973: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1716] Found device 0 with properties:
pciBusID: 0000:01:00.0 name: GeForce GTX 980 Ti computeCapability: 5.2
coreClock: 1.2405GHz coreCount: 22 deviceMemorySize: 6.00GiB deviceMemoryBandwidth: 313.37GiB/s
2020-09-26 13:56:06.651309: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
2020-09-26 13:56:06.661752: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cublas64_10.dll'; dlsym error: cublas64_10.dll not found
2020-09-26 13:56:06.696173: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cufft64_10.dll
2020-09-26 13:56:06.708148: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library curand64_10.dll
2020-09-26 13:56:06.745939: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cusolver64_10.dll
2020-09-26 13:56:06.767108: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cusparse64_10.dll
2020-09-26 13:56:06.832676: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudnn64_7.dll
2020-09-26 13:56:06.832872: W tensorflow/core/common_runtime/gpu/gpu_device.cc:1753] Cannot dlopen some GPU libraries. Please make sure the missing libraries mentioned above are installed properly if you
Skipping registering GPU devices...
2020-09-26 13:56:06.834338: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN)to use the following CPU instructions
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.
2020-09-26 13:56:06.856422: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x1f23859f320 initialized for platform Host (this does not guarantee that XLA will be used). Devices:
2020-09-26 13:56:06.856721: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): Host, Default Version
2020-09-26 13:56:06.857535: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1257] Device interconnect StreamExecutor with strength 1 edge matrix:
2020-09-26 13:56:06.857700: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1263]
Epoch 1/15
1/512 [........................] - ETA: 0s - loss: 5.2186 - acc: 0.0000e+00
2/512 [........................] - ETA: 7:42 - loss: 5.0669 - acc: 0.0000e+00
3/512 [........................] - ETA: 10:26 - loss: 4.9861 - acc: 0.0208
4/512 [........................] - ETA: 11:48 - loss: 5.0349 - acc: 0.0156
5/512 [........................] - ETA: 12:31 - loss: 5.0885 - acc: 0.0125
6/512 [........................] - ETA: 13:25 - loss: 5.0448 - acc: 0.0104
7/512 [........................] - ETA: 13:45 - loss: 5.0640 - acc: 0.0089
8/512 [........................] - ETA: 13:56 - loss: 5.0656 - acc: 0.0078
9/512 [........................] - ETA: 14:04 - loss: 5.0251 - acc: 0.0208
10/512 [........................] - ETA: 14:11 - loss: 5.0415 - acc: 0.0188
11/512 [........................] - ETA: 14:19 - loss: 5.0161 - acc: 0.0170
12/512 [........................] - ETA: 14:24 - loss: 4.9958 - acc: 0.0208
13/512 [........................] - ETA: 14:28 - loss: 4.9934 - acc: 0.0192
14/512 [........................] - ETA: 14:30 - loss: 4.9911 - acc: 0.0179
15/512 [........................] - ETA: 14:32 - loss: 4.9901 - acc: 0.0208
16/512 [........................] - ETA: 14:33 - loss: 4.9811 - acc: 0.0195
17/512 [........................] - ETA: 14:33 - loss: 4.9816 - acc: 0.0184
18/512 [>........................] - ETA: 14:33 - loss: 4.9706 - acc: 0.0174
```

Test 4

```
506/512 [=====>.] - ETA: 11s - loss: 2.7837 - acc: 0.3388
507/512 [=====>.] - ETA: 9s - loss: 2.7807 - acc: 0.3394
508/512 [=====>.] - ETA: 7s - loss: 2.7779 - acc: 0.3399
509/512 [=====>.] - ETA: 5s - loss: 2.7754 - acc: 0.3401
510/512 [=====>.] - ETA: 3s - loss: 2.7736 - acc: 0.3403
511/512 [=====>.] - ETA: 1s - loss: 2.7705 - acc: 0.3409
512/512 [=====] - ETA: 0s - loss: 2.7707 - acc: 0.3408
Epoch 00001: val_loss improved from inf to 1.76321, saving model to model.h5
512/512 [=====] - 989s 2s/step - loss: 2.7707 - acc: 0.3408 - val_loss: 1.7632 - val_acc: 0.5100
Epoch 2/15
  1/512 [.....] - ETA: 0s - loss: 1.0813 - acc: 0.6875
  2/512 [.....] - ETA: 7:51 - loss: 1.4163 - acc: 0.6250
  3/512 [.....] - ETA: 10:32 - loss: 1.4084 - acc: 0.6458
  4/512 [.....] - ETA: 11:42 - loss: 1.3575 - acc: 0.6719
  5/512 [.....] - ETA: 12:25 - loss: 1.3575 - acc: 0.6500
  6/512 [.....] - ETA: 12:53 - loss: 1.4009 - acc: 0.6354
  7/512 [.....] - ETA: 13:14 - loss: 1.4615 - acc: 0.6250
  8/512 [.....] - ETA: 13:27 - loss: 1.4730 - acc: 0.6250
  9/512 [.....] - ETA: 13:38 - loss: 1.5541 - acc: 0.6111
  10/512 [.....] - ETA: 13:46 - loss: 1.5209 - acc: 0.6250
  11/512 [.....] - ETA: 13:53 - loss: 1.4894 - acc: 0.6136
  12/512 [.....] - ETA: 13:59 - loss: 1.5072 - acc: 0.6042
  13/512 [.....] - ETA: 14:03 - loss: 1.5472 - acc: 0.5913
  14/512 [.....] - ETA: 14:05 - loss: 1.5316 - acc: 0.5938
  15/512 [.....] - ETA: 14:10 - loss: 1.5232 - acc: 0.5875
  16/512 [.....] - ETA: 14:13 - loss: 1.5114 - acc: 0.5820
  17/512 [.....] - ETA: 14:15 - loss: 1.5048 - acc: 0.5846
```

Test 4

```
Python - train.py:96 ✓
499/512 [=====>.] - ETA: 24s - loss: 0.9647 - acc: 0.7255
500/512 [=====>.] - ETA: 22s - loss: 0.9637 - acc: 0.7259
501/512 [=====>.] - ETA: 20s - loss: 0.9631 - acc: 0.7258
502/512 [=====>.] - ETA: 18s - loss: 0.9632 - acc: 0.7257
503/512 [=====>.] - ETA: 16s - loss: 0.9627 - acc: 0.7256
504/512 [=====>.] - ETA: 14s - loss: 0.9630 - acc: 0.7257
505/512 [=====>.] - ETA: 13s - loss: 0.9623 - acc: 0.7260
506/512 [=====>.] - ETA: 11s - loss: 0.9615 - acc: 0.7262
507/512 [=====>.] - ETA: 9s - loss: 0.9605 - acc: 0.7265
508/512 [=====>.] - ETA: 7s - loss: 0.9599 - acc: 0.7266
509/512 [=====>.] - ETA: 5s - loss: 0.9596 - acc: 0.7267
510/512 [=====>.] - ETA: 3s - loss: 0.9591 - acc: 0.7270
511/512 [=====>.] - ETA: 1s - loss: 0.9579 - acc: 0.7274
512/512 [=====] - ETA: 0s - loss: 0.9582 - acc: 0.7274
Epoch 00002: val_loss improved from 1.76321 to 1.44518, saving model to model.h5
512/512 [=====] - 976s 2s/step - loss: 0.9582 - acc: 0.7274 - val_loss: 1.4452 - val_acc: 0.5995
Epoch 3/15
< 1/512 [.....] - ETA: 0s - loss: 0.3313 - acc: 0.9375
  2/512 [.....] - ETA: 7:58 - loss: 0.4654 - acc: 0.9062
  3/512 [.....] - ETA: 10:34 - loss: 0.4519 - acc: 0.9167
  4/512 [.....] - ETA: 11:48 - loss: 0.4759 - acc: 0.8906
  5/512 [.....] - ETA: 12:37 - loss: 0.5243 - acc: 0.8375
  6/512 [.....] - ETA: 13:07 - loss: 0.5397 - acc: 0.8333
  7/512 [.....] - ETA: 13:28 - loss: 0.5575 - acc: 0.8393
  8/512 [.....] - ETA: 13:41 - loss: 0.5671 - acc: 0.8438
  9/512 [.....] - ETA: 13:58 - loss: 0.6462 - acc: 0.8194
 10/512 [.....] - ETA: 14:08 - loss: 0.6355 - acc: 0.8313
 11/512 [.....] - ETA: 14:15 - loss: 0.6167 - acc: 0.8409
 12/512 [.....] - ETA: 14:18 - loss: 0.6245 - acc: 0.8385
 13/512 [.....] - ETA: 14:23 - loss: 0.6376 - acc: 0.8317
 14/512 [.....] - ETA: 14:25 - loss: 0.6173 - acc: 0.8393
 15/512 [.....] - ETA: 14:27 - loss: 0.6056 - acc: 0.8458
 16/512 [.....] - ETA: 14:28 - loss: 0.5988 - acc: 0.8438
 17/512 [.....] - ETA: 14:30 - loss: 0.5877 - acc: 0.8493
 18/512 [>.....] - ETA: 14:33 - loss: 0.5819 - acc: 0.8542
 19/512 [>.....] - ETA: 14:34 - loss: 0.5938 - acc: 0.8487
 20/512 [>.....] - ETA: 14:35 - loss: 0.6206 - acc: 0.8438
```

Test 4

```
Python - train.py:96 ✓
485/512 [=====>..] - ETA: 30s - loss: 0.3301 - acc: 0.9227
486/512 [=====>..] - ETA: 48s - loss: 0.3301 - acc: 0.9226
487/512 [=====>..] - ETA: 46s - loss: 0.3298 - acc: 0.9226
488/512 [=====>..] - ETA: 44s - loss: 0.3294 - acc: 0.9228
489/512 [=====>..] - ETA: 42s - loss: 0.3292 - acc: 0.9228
490/512 [=====>..] - ETA: 41s - loss: 0.3288 - acc: 0.9230
491/512 [=====>..] - ETA: 39s - loss: 0.3285 - acc: 0.9230
492/512 [=====>..] - ETA: 37s - loss: 0.3281 - acc: 0.9231
493/512 [=====>..] - ETA: 35s - loss: 0.3280 - acc: 0.9232
494/512 [=====>..] - ETA: 33s - loss: 0.3276 - acc: 0.9233
495/512 [=====>..] - ETA: 31s - loss: 0.3271 - acc: 0.9235
496/512 [=====>..] - ETA: 29s - loss: 0.3273 - acc: 0.9235
497/512 [=====>..] - ETA: 28s - loss: 0.3268 - acc: 0.9237
498/512 [=====>..] - ETA: 26s - loss: 0.3264 - acc: 0.9238
499/512 [=====>..] - ETA: 24s - loss: 0.3259 - acc: 0.9240
500/512 [=====>..] - ETA: 22s - loss: 0.3256 - acc: 0.9240
501/512 [=====>..] - ETA: 20s - loss: 0.3252 - acc: 0.9242
502/512 [=====>..] - ETA: 18s - loss: 0.3253 - acc: 0.9242
< 03/512 [=====>..] - ETA: 16s - loss: 0.3250 - acc: 0.9242
504/512 [=====>..] - ETA: 14s - loss: 0.3251 - acc: 0.9242
505/512 [=====>..] - ETA: 13s - loss: 0.3248 - acc: 0.9244
506/512 [=====>..] - ETA: 11s - loss: 0.3243 - acc: 0.9245
507/512 [=====>..] - ETA: 9s - loss: 0.3241 - acc: 0.9246
508/512 [=====>..] - ETA: 7s - loss: 0.3239 - acc: 0.9246
509/512 [=====>..] - ETA: 5s - loss: 0.3237 - acc: 0.9245
510/512 [=====>..] - ETA: 3s - loss: 0.3232 - acc: 0.9246
511/512 [=====>..] - ETA: 1s - loss: 0.3228 - acc: 0.9248
512/512 [=====>..] - ETA: 0s - loss: 0.3229 - acc: 0.9248
Epoch 00003: val_loss improved from 1.44518 to 1.37425, saving model to model.h5
512/512 [=====>..] - 981s 2s/step - loss: 0.3229 - acc: 0.9248 - val_loss: 1.3742 - val_acc: 0.6225
Epoch 4/15
1/512 [.....] - ETA: 0s - loss: 0.1281 - acc: 0.9375
2/512 [.....] - ETA: 8:07 - loss: 0.1252 - acc: 0.9688
3/512 [.....] - ETA: 10:47 - loss: 0.1370 - acc: 0.9792
4/512 [.....] - ETA: 12:06 - loss: 0.1247 - acc: 0.9844
5/512 [.....] - ETA: 12:50 - loss: 0.1426 - acc: 0.9750
6/512 [.....] - ETA: 13:20 - loss: 0.1546 - acc: 0.9688
7/512 [.....] - ETA: 13:43 - loss: 0.1556 - acc: 0.9732
8/512 [.....] - ETA: 13:58 - loss: 0.1674 - acc: 0.9688
9/512 [.....] - ETA: 14:06 - loss: 0.1943 - acc: 0.9653
10/512 [.....] - ETA: 14:12 - loss: 0.1863 - acc: 0.9688
11/512 [.....] - ETA: 14:19 - loss: 0.1802 - acc: 0.9716
```

Test 4

```
485/512 [=====>..] - ETA: 38s - loss: 0.1040 - acc: 0.9867
486/512 [=====>..] - ETA: 48s - loss: 0.1039 - acc: 0.9868
487/512 [=====>..] - ETA: 46s - loss: 0.1039 - acc: 0.9867
488/512 [=====>..] - ETA: 45s - loss: 0.1038 - acc: 0.9867
489/512 [=====>..] - ETA: 43s - loss: 0.1037 - acc: 0.9867
490/512 [=====>..] - ETA: 41s - loss: 0.1035 - acc: 0.9867
491/512 [=====>..] - ETA: 39s - loss: 0.1034 - acc: 0.9868
492/512 [=====>..] - ETA: 37s - loss: 0.1034 - acc: 0.9868
493/512 [=====>..] - ETA: 35s - loss: 0.1033 - acc: 0.9868
494/512 [=====>..] - ETA: 33s - loss: 0.1032 - acc: 0.9868
495/512 [=====>..] - ETA: 31s - loss: 0.1030 - acc: 0.9869
496/512 [=====>..] - ETA: 30s - loss: 0.1029 - acc: 0.9869
497/512 [=====>..] - ETA: 28s - loss: 0.1028 - acc: 0.9869
498/512 [=====>..] - ETA: 26s - loss: 0.1027 - acc: 0.9869
499/512 [=====>..] - ETA: 24s - loss: 0.1027 - acc: 0.9870
500/512 [=====>..] - ETA: 22s - loss: 0.1027 - acc: 0.9870
501/512 [=====>..] - ETA: 20s - loss: 0.1026 - acc: 0.9870
502/512 [=====>..] - ETA: 18s - loss: 0.1026 - acc: 0.9871
< 03/512 [=====>..] - ETA: 16s - loss: 0.1026 - acc: 0.9870
504/512 [=====>..] - ETA: 15s - loss: 0.1025 - acc: 0.9870
505/512 [=====>..] - ETA: 13s - loss: 0.1025 - acc: 0.9870
506/512 [=====>..] - ETA: 11s - loss: 0.1024 - acc: 0.9870
507/512 [=====>..] - ETA: 9s - loss: 0.1023 - acc: 0.9871
508/512 [=====>..] - ETA: 7s - loss: 0.1022 - acc: 0.9871
509/512 [=====>..] - ETA: 5s - loss: 0.1021 - acc: 0.9871
510/512 [=====>..] - ETA: 3s - loss: 0.1020 - acc: 0.9871
511/512 [=====>..] - ETA: 1s - loss: 0.1019 - acc: 0.9872
512/512 [=====] - ETA: 0s - loss: 0.1019 - acc: 0.9872
Epoch 00004: val_loss improved from 1.37425 to 1.32449, saving model to model.h5
512/512 [=====] - 986s 2s/step - loss: 0.1019 - acc: 0.9872 - val_loss: 1.3245 - val_acc: 0.6411
Epoch 5/15
 1/512 [.....] - ETA: 0s - loss: 0.0433 - acc: 1.0000
 2/512 [.....] - ETA: 8:04 - loss: 0.0653 - acc: 1.0000
 3/512 [.....] - ETA: 10:43 - loss: 0.0772 - acc: 0.9792
 4/512 [.....] - ETA: 12:02 - loss: 0.0886 - acc: 0.9688
 5/512 [.....] - ETA: 12:44 - loss: 0.0891 - acc: 0.9750
 6/512 [.....] - ETA: 13:11 - loss: 0.0780 - acc: 0.9792
 7/512 [.....] - ETA: 13:29 - loss: 0.0737 - acc: 0.9821
 8/512 [.....] - ETA: 13:45 - loss: 0.0694 - acc: 0.9844
 9/512 [.....] - ETA: 13:56 - loss: 0.0671 - acc: 0.9861
10/512 [.....] - ETA: 14:06 - loss: 0.0646 - acc: 0.9875
```

Test 4

```
+00/512 [=====>..] - ETA: 20s - loss: 0.0412 - acc: 0.9965
486/512 [=====>..] - ETA: 48s - loss: 0.0412 - acc: 0.9965
487/512 [=====>..] - ETA: 46s - loss: 0.0411 - acc: 0.9965
488/512 [=====>..] - ETA: 44s - loss: 0.0411 - acc: 0.9965
489/512 [=====>..] - ETA: 42s - loss: 0.0411 - acc: 0.9965
490/512 [=====>..] - ETA: 41s - loss: 0.0411 - acc: 0.9966
491/512 [=====>..] - ETA: 39s - loss: 0.0410 - acc: 0.9966
492/512 [=====>..] - ETA: 37s - loss: 0.0410 - acc: 0.9966
493/512 [=====>..] - ETA: 35s - loss: 0.0409 - acc: 0.9966
494/512 [=====>..] - ETA: 33s - loss: 0.0409 - acc: 0.9966
495/512 [=====>..] - ETA: 31s - loss: 0.0409 - acc: 0.9966
496/512 [=====>..] - ETA: 29s - loss: 0.0408 - acc: 0.9966
497/512 [=====>..] - ETA: 28s - loss: 0.0409 - acc: 0.9966
498/512 [=====>..] - ETA: 26s - loss: 0.0408 - acc: 0.9966
499/512 [=====>..] - ETA: 24s - loss: 0.0408 - acc: 0.9966
500/512 [=====>..] - ETA: 22s - loss: 0.0407 - acc: 0.9966
501/512 [=====>..] - ETA: 20s - loss: 0.0406 - acc: 0.9966
502/512 [=====>..] - ETA: 18s - loss: 0.0407 - acc: 0.9966
503/512 [=====>..] - ETA: 16s - loss: 0.0407 - acc: 0.9966
504/512 [=====>..] - ETA: 14s - loss: 0.0408 - acc: 0.9967
505/512 [=====>..] - ETA: 13s - loss: 0.0408 - acc: 0.9967
506/512 [=====>..] - ETA: 11s - loss: 0.0407 - acc: 0.9967
507/512 [=====>..] - ETA: 9s - loss: 0.0407 - acc: 0.9967
508/512 [=====>..] - ETA: 7s - loss: 0.0406 - acc: 0.9967
509/512 [=====>..] - ETA: 5s - loss: 0.0406 - acc: 0.9967
510/512 [=====>..] - ETA: 3s - loss: 0.0405 - acc: 0.9967
511/512 [=====>..] - ETA: 1s - loss: 0.0405 - acc: 0.9967
512/512 [=====] - ETA: 0s - loss: 0.0405 - acc: 0.9967
Epoch 00005: val_loss improved from 1.32449 to 1.22149, saving model to model.h5
512/512 [=====] - 982s 2s/step - loss: 0.0405 - acc: 0.9967 - val_loss: 1.2215 - val_acc: 0.6866
Epoch 6/15
 1/512 [.....] - ETA: 0s - loss: 0.0143 - acc: 1.0000
 2/512 [.....] - ETA: 7:44 - loss: 0.0193 - acc: 1.0000
 3/512 [.....] - ETA: 10:26 - loss: 0.0183 - acc: 1.0000
 4/512 [.....] - ETA: 11:44 - loss: 0.0209 - acc: 1.0000
 5/512 [.....] - ETA: 12:35 - loss: 0.0216 - acc: 1.0000
 6/512 [.....] - ETA: 13:03 - loss: 0.0223 - acc: 1.0000
 7/512 [.....] - ETA: 13:27 - loss: 0.0213 - acc: 1.0000
 8/512 [.....] - ETA: 13:44 - loss: 0.0211 - acc: 1.0000
 9/512 [.....] - ETA: 13:54 - loss: 0.0218 - acc: 1.0000
10/512 [.....] - ETA: 14:03 - loss: 0.0230 - acc: 1.0000
```

Test 4

```
400/512 [=====>..] - ETA: 50s - loss: 0.0188 - acc: 0.9994
486/512 [=====>..] - ETA: 48s - loss: 0.0188 - acc: 0.9994
487/512 [=====>..] - ETA: 46s - loss: 0.0188 - acc: 0.9994
488/512 [=====>..] - ETA: 44s - loss: 0.0188 - acc: 0.9994
489/512 [=====>..] - ETA: 43s - loss: 0.0188 - acc: 0.9994
490/512 [=====>..] - ETA: 41s - loss: 0.0187 - acc: 0.9994
491/512 [=====>..] - ETA: 39s - loss: 0.0187 - acc: 0.9994
492/512 [=====>..] - ETA: 37s - loss: 0.0187 - acc: 0.9994
493/512 [=====>..] - ETA: 35s - loss: 0.0187 - acc: 0.9994
494/512 [=====>..] - ETA: 33s - loss: 0.0187 - acc: 0.9994
495/512 [=====>..] - ETA: 31s - loss: 0.0186 - acc: 0.9994
496/512 [=====>..] - ETA: 29s - loss: 0.0187 - acc: 0.9994
497/512 [=====>..] - ETA: 28s - loss: 0.0186 - acc: 0.9994
498/512 [=====>..] - ETA: 26s - loss: 0.0186 - acc: 0.9994
499/512 [=====>..] - ETA: 24s - loss: 0.0186 - acc: 0.9994
500/512 [=====>..] - ETA: 22s - loss: 0.0186 - acc: 0.9994
501/512 [=====>..] - ETA: 20s - loss: 0.0187 - acc: 0.9994
502/512 [=====>..] - ETA: 18s - loss: 0.0187 - acc: 0.9994
503/512 [=====>..] - ETA: 16s - loss: 0.0187 - acc: 0.9994
504/512 [=====>..] - ETA: 14s - loss: 0.0186 - acc: 0.9994
505/512 [=====>..] - ETA: 13s - loss: 0.0186 - acc: 0.9994
506/512 [=====>..] - ETA: 11s - loss: 0.0187 - acc: 0.9994
507/512 [=====>..] - ETA: 9s - loss: 0.0186 - acc: 0.9994
508/512 [=====>..] - ETA: 7s - loss: 0.0186 - acc: 0.9994
509/512 [=====>..] - ETA: 5s - loss: 0.0186 - acc: 0.9994
510/512 [=====>..] - ETA: 3s - loss: 0.0186 - acc: 0.9994
511/512 [=====>..] - ETA: 1s - loss: 0.0186 - acc: 0.9994
512/512 [=====] - ETA: 0s - loss: 0.0186 - acc: 0.9994
Epoch 00006: val_loss improved from 1.22149 to 1.16262, saving model to model.h5
512/512 [=====] - 983s 2s/step - loss: 0.0186 - acc: 0.9994 - val_loss: 1.1626 - val_acc: 0.6973
Epoch 7/15
1/512 [.....] - ETA: 0s - loss: 0.0135 - acc: 1.0000
2/512 [.....] - ETA: 8:03 - loss: 0.0100 - acc: 1.0000
3/512 [.....] - ETA: 10:46 - loss: 0.0116 - acc: 1.0000
4/512 [.....] - ETA: 12:00 - loss: 0.0105 - acc: 1.0000
5/512 [.....] - ETA: 12:42 - loss: 0.0160 - acc: 1.0000
6/512 [.....] - ETA: 13:12 - loss: 0.0154 - acc: 1.0000
7/512 [.....] - ETA: 13:30 - loss: 0.0152 - acc: 1.0000
8/512 [.....] - ETA: 13:48 - loss: 0.0150 - acc: 1.0000
9/512 [.....] - ETA: 13:58 - loss: 0.0147 - acc: 1.0000
10/512 [.....] - ETA: 14:07 - loss: 0.0140 - acc: 1.0000
11/512 [.....] - ETA: 14:13 - loss: 0.0156 - acc: 1.0000
```


Test 4

```
499/512 [=====>.] - ETA: 24s - loss: 0.0054 - acc: 1.0000
500/512 [=====>.] - ETA: 22s - loss: 0.0054 - acc: 1.0000
501/512 [=====>.] - ETA: 20s - loss: 0.0054 - acc: 1.0000
502/512 [=====>.] - ETA: 18s - loss: 0.0054 - acc: 1.0000
503/512 [=====>.] - ETA: 16s - loss: 0.0054 - acc: 1.0000
504/512 [=====>.] - ETA: 14s - loss: 0.0054 - acc: 1.0000
505/512 [=====>.] - ETA: 13s - loss: 0.0054 - acc: 1.0000
506/512 [=====>.] - ETA: 11s - loss: 0.0054 - acc: 1.0000
507/512 [=====>.] - ETA: 9s - loss: 0.0054 - acc: 1.0000
508/512 [=====>.] - ETA: 7s - loss: 0.0054 - acc: 1.0000
509/512 [=====>.] - ETA: 5s - loss: 0.0054 - acc: 1.0000
510/512 [=====>.] - ETA: 3s - loss: 0.0054 - acc: 1.0000
511/512 [=====>.] - ETA: 1s - loss: 0.0053 - acc: 1.0000
512/512 [=====] - ETA: 0s - loss: 0.0053 - acc: 1.0000
Epoch 00008: val_loss did not improve from 1.15495
512/512 [=====] - 983s 2s/step - loss: 0.0053 - acc: 1.0000 - val_loss: 1.1751 - val_acc: 0.7086
Epoch 9/15
< 1/512 [.....] - ETA: 0s - loss: 0.0029 - acc: 1.0000
  2/512 [.....] - ETA: 7:48 - loss: 0.0037 - acc: 1.0000
  3/512 [.....] - ETA: 10:27 - loss: 0.0034 - acc: 1.0000
  4/512 [.....] - ETA: 11:47 - loss: 0.0033 - acc: 1.0000
  5/512 [.....] - ETA: 12:31 - loss: 0.0030 - acc: 1.0000
  6/512 [.....] - ETA: 13:08 - loss: 0.0031 - acc: 1.0000
  7/512 [.....] - ETA: 13:28 - loss: 0.0037 - acc: 1.0000
  8/512 [.....] - ETA: 13:43 - loss: 0.0037 - acc: 1.0000
  9/512 [.....] - ETA: 13:53 - loss: 0.0037 - acc: 1.0000
  10/512 [.....] - ETA: 14:04 - loss: 0.0039 - acc: 1.0000
  11/512 [.....] - ETA: 14:10 - loss: 0.0038 - acc: 1.0000
  12/512 [.....] - ETA: 14:16 - loss: 0.0037 - acc: 1.0000
  13/512 [.....] - ETA: 14:19 - loss: 0.0035 - acc: 1.0000
  14/512 [.....] - ETA: 14:24 - loss: 0.0034 - acc: 1.0000
  15/512 [.....] - ETA: 14:26 - loss: 0.0034 - acc: 1.0000
  16/512 [.....] - ETA: 14:26 - loss: 0.0033 - acc: 1.0000
  17/512 [.....] - ETA: 14:29 - loss: 0.0034 - acc: 1.0000
  18/512 [>.....] - ETA: 14:31 - loss: 0.0034 - acc: 1.0000
  19/512 [>.....] - ETA: 14:33 - loss: 0.0036 - acc: 1.0000
  20/512 [>.....] - ETA: 14:34 - loss: 0.0036 - acc: 1.0000
  21/512 [>.....] - ETA: 14:34 - loss: 0.0036 - acc: 1.0000
  22/512 [>.....] - ETA: 14:34 - loss: 0.0036 - acc: 1.0000
  23/512 [>.....] - ETA: 14:34 - loss: 0.0037 - acc: 1.0000
  24/512 [>.....] - ETA: 14:37 - loss: 0.0036 - acc: 1.0000
```

Test 4

```
492/512 [=====>...] - ETA: 37s - loss: 0.0032 - acc: 1.0000
493/512 [=====>...] - ETA: 35s - loss: 0.0032 - acc: 1.0000
494/512 [=====>...] - ETA: 33s - loss: 0.0032 - acc: 1.0000
495/512 [=====>...] - ETA: 31s - loss: 0.0032 - acc: 1.0000
496/512 [=====>...] - ETA: 30s - loss: 0.0032 - acc: 1.0000
497/512 [=====>...] - ETA: 28s - loss: 0.0032 - acc: 1.0000
498/512 [=====>...] - ETA: 26s - loss: 0.0032 - acc: 1.0000
499/512 [=====>...] - ETA: 24s - loss: 0.0032 - acc: 1.0000
500/512 [=====>...] - ETA: 22s - loss: 0.0032 - acc: 1.0000
501/512 [=====>...] - ETA: 20s - loss: 0.0032 - acc: 1.0000
502/512 [=====>...] - ETA: 18s - loss: 0.0032 - acc: 1.0000
503/512 [=====>...] - ETA: 16s - loss: 0.0032 - acc: 1.0000
504/512 [=====>...] - ETA: 15s - loss: 0.0032 - acc: 1.0000
505/512 [=====>...] - ETA: 13s - loss: 0.0032 - acc: 1.0000
506/512 [=====>...] - ETA: 11s - loss: 0.0032 - acc: 1.0000
507/512 [=====>...] - ETA: 9s - loss: 0.0032 - acc: 1.0000
508/512 [=====>...] - ETA: 7s - loss: 0.0032 - acc: 1.0000
509/512 [=====>...] - ETA: 5s - loss: 0.0032 - acc: 1.0000
10/512 [=====>...] - ETA: 3s - loss: 0.0032 - acc: 1.0000
511/512 [=====>...] - ETA: 1s - loss: 0.0032 - acc: 1.0000
512/512 [=====] - ETA: 0s - loss: 0.0032 - acc: 1.0000
Epoch 00009: val_loss did not improve from 1.15495
512/512 [=====] - 986s 2s/step - loss: 0.0032 - acc: 1.0000 - val_loss: 1.1852 - val_acc: 0.7095
Epoch 10/15
 1/512 [.....] - ETA: 0s - loss: 0.0025 - acc: 1.0000
 2/512 [.....] - ETA: 7:59 - loss: 0.0023 - acc: 1.0000
 3/512 [.....] - ETA: 10:43 - loss: 0.0022 - acc: 1.0000
 4/512 [.....] - ETA: 12:02 - loss: 0.0020 - acc: 1.0000
 5/512 [.....] - ETA: 12:44 - loss: 0.0018 - acc: 1.0000
 6/512 [.....] - ETA: 13:14 - loss: 0.0018 - acc: 1.0000
 7/512 [.....] - ETA: 13:35 - loss: 0.0018 - acc: 1.0000
 8/512 [.....] - ETA: 13:47 - loss: 0.0020 - acc: 1.0000
 9/512 [.....] - ETA: 13:58 - loss: 0.0023 - acc: 1.0000
10/512 [.....] - ETA: 14:09 - loss: 0.0024 - acc: 1.0000
11/512 [.....] - ETA: 14:16 - loss: 0.0023 - acc: 1.0000
12/512 [.....] - ETA: 14:22 - loss: 0.0024 - acc: 1.0000
13/512 [.....] - ETA: 14:27 - loss: 0.0027 - acc: 1.0000
14/512 [.....] - ETA: 14:31 - loss: 0.0027 - acc: 1.0000
15/512 [.....] - ETA: 14:33 - loss: 0.0026 - acc: 1.0000
16/512 [.....] - ETA: 14:35 - loss: 0.0025 - acc: 1.0000
17/512 [.....] - ETA: 14:38 - loss: 0.0025 - acc: 1.0000
18/512 [.....] - ETA: 14:38 - loss: 0.0025 - acc: 1.0000
```

Test 4

```
497/512 [=====>.] - ETA: 28s - loss: 0.0011 - acc: 1.0000
498/512 [=====>.] - ETA: 26s - loss: 0.0011 - acc: 1.0000
499/512 [=====>.] - ETA: 24s - loss: 0.0011 - acc: 1.0000
500/512 [=====>.] - ETA: 22s - loss: 0.0011 - acc: 1.0000
501/512 [=====>.] - ETA: 20s - loss: 0.0011 - acc: 1.0000
502/512 [=====>.] - ETA: 18s - loss: 0.0011 - acc: 1.0000
503/512 [=====>.] - ETA: 16s - loss: 0.0011 - acc: 1.0000
504/512 [=====>.] - ETA: 15s - loss: 0.0011 - acc: 1.0000
505/512 [=====>.] - ETA: 13s - loss: 0.0011 - acc: 1.0000
506/512 [=====>.] - ETA: 11s - loss: 0.0011 - acc: 1.0000
507/512 [=====>.] - ETA: 9s - loss: 0.0011 - acc: 1.0000
508/512 [=====>.] - ETA: 7s - loss: 0.0011 - acc: 1.0000
509/512 [=====>.] - ETA: 5s - loss: 0.0011 - acc: 1.0000
510/512 [=====>.] - ETA: 3s - loss: 0.0011 - acc: 1.0000
511/512 [=====>.] - ETA: 1s - loss: 0.0011 - acc: 1.0000
512/512 [=====] - ETA: 0s - loss: 0.0011 - acc: 1.0000
Epoch 00012: val_loss did not improve from 1.15495
< 12/512 [=====] - 986s 2s/step - loss: 0.0011 - acc: 1.0000 - val_loss: 1.2326 - val_acc: 0.7183
epoch 13/15
 1/512 [.....] - ETA: 0s - loss: 9.7146e-04 - acc: 1.0000
 2/512 [.....] - ETA: 7:53 - loss: 0.0010 - acc: 1.0000
 3/512 [.....] - ETA: 10:28 - loss: 9.5854e-04 - acc: 1.0000
 4/512 [.....] - ETA: 11:48 - loss: 8.8940e-04 - acc: 1.0000
 5/512 [.....] - ETA: 12:35 - loss: 8.6536e-04 - acc: 1.0000
 6/512 [.....] - ETA: 13:04 - loss: 9.1368e-04 - acc: 1.0000
 7/512 [.....] - ETA: 13:25 - loss: 9.4205e-04 - acc: 1.0000
 8/512 [.....] - ETA: 13:41 - loss: 9.6058e-04 - acc: 1.0000
 9/512 [.....] - ETA: 13:51 - loss: 0.0011 - acc: 1.0000
10/512 [.....] - ETA: 13:59 - loss: 0.0010 - acc: 1.0000
11/512 [.....] - ETA: 14:08 - loss: 0.0010 - acc: 1.0000
12/512 [.....] - ETA: 14:13 - loss: 9.9575e-04 - acc: 1.0000
13/512 [.....] - ETA: 14:18 - loss: 0.0010 - acc: 1.0000
14/512 [.....] - ETA: 14:21 - loss: 9.8698e-04 - acc: 1.0000
15/512 [.....] - ETA: 14:23 - loss: 0.0010 - acc: 1.0000
16/512 [.....] - ETA: 14:26 - loss: 0.0010 - acc: 1.0000
17/512 [.....] - ETA: 14:28 - loss: 0.0010 - acc: 1.0000
18/512 [>.....] - ETA: 14:29 - loss: 0.0010 - acc: 1.0000
19/512 [>.....] - ETA: 14:30 - loss: 0.0010 - acc: 1.0000
```

Test 4

```
494/512 [=====>..] - ETA: 33s - loss: 8.1628e-04 - acc: 1.0000
495/512 [=====>..] - ETA: 31s - loss: 8.1680e-04 - acc: 1.0000
496/512 [=====>..] - ETA: 30s - loss: 8.1752e-04 - acc: 1.0000
497/512 [=====>..] - ETA: 28s - loss: 8.1747e-04 - acc: 1.0000
498/512 [=====>..] - ETA: 26s - loss: 8.1680e-04 - acc: 1.0000
499/512 [=====>..] - ETA: 24s - loss: 8.1711e-04 - acc: 1.0000
500/512 [=====>..] - ETA: 22s - loss: 8.1736e-04 - acc: 1.0000
501/512 [=====>..] - ETA: 20s - loss: 8.1668e-04 - acc: 1.0000
502/512 [=====>..] - ETA: 18s - loss: 8.1975e-04 - acc: 1.0000
503/512 [=====>..] - ETA: 16s - loss: 8.1942e-04 - acc: 1.0000
504/512 [=====>..] - ETA: 15s - loss: 8.1936e-04 - acc: 1.0000
505/512 [=====>..] - ETA: 13s - loss: 8.1907e-04 - acc: 1.0000
506/512 [=====>..] - ETA: 11s - loss: 8.1922e-04 - acc: 1.0000
507/512 [=====>..] - ETA: 9s - loss: 8.1922e-04 - acc: 1.0000
508/512 [=====>..] - ETA: 7s - loss: 8.1839e-04 - acc: 1.0000
509/512 [=====>..] - ETA: 5s - loss: 8.1870e-04 - acc: 1.0000
510/512 [=====>..] - ETA: 3s - loss: 8.1819e-04 - acc: 1.0000
511/512 [=====>..] - ETA: 1s - loss: 8.1836e-04 - acc: 1.0000
< 12/512 [=====] - ETA: 0s - loss: 8.1835e-04 - acc: 1.0000
Epoch 00013: val_loss did not improve from 1.15495
512/512 [=====] - 985s 2s/step - loss: 8.1835e-04 - acc: 1.0000 - val_loss: 1.2348 - val_acc: 0.7154
Epoch 14/15
 1/512 [.....] - ETA: 0s - loss: 0.0011 - acc: 1.0000
 2/512 [.....] - ETA: 8:02 - loss: 0.0012 - acc: 1.0000
 3/512 [.....] - ETA: 10:49 - loss: 9.3961e-04 - acc: 1.0000
 4/512 [.....] - ETA: 12:05 - loss: 8.2824e-04 - acc: 1.0000
 5/512 [.....] - ETA: 12:50 - loss: 7.5298e-04 - acc: 1.0000
 6/512 [.....] - ETA: 13:22 - loss: 7.2480e-04 - acc: 1.0000
 7/512 [.....] - ETA: 13:42 - loss: 9.4838e-04 - acc: 1.0000
 8/512 [.....] - ETA: 13:54 - loss: 9.1083e-04 - acc: 1.0000
 9/512 [.....] - ETA: 14:04 - loss: 9.0117e-04 - acc: 1.0000
10/512 [.....] - ETA: 14:12 - loss: 9.1433e-04 - acc: 1.0000
11/512 [.....] - ETA: 14:18 - loss: 8.8195e-04 - acc: 1.0000
12/512 [.....] - ETA: 14:23 - loss: 8.7515e-04 - acc: 1.0000
13/512 [.....] - ETA: 14:26 - loss: 8.7381e-04 - acc: 1.0000
14/512 [.....] - ETA: 14:29 - loss: 8.5914e-04 - acc: 1.0000
15/512 [.....] - ETA: 14:31 - loss: 8.4931e-04 - acc: 1.0000
16/512 [.....] - ETA: 14:34 - loss: 8.2620e-04 - acc: 1.0000
17/512 [.....] - ETA: 14:35 - loss: 8.1380e-04 - acc: 1.0000
```

Test 4

```
< 93/512 [=====>..] - ETA: 35s - loss: 7.0527e-04 - acc: 1.0000
494/512 [=====>..] - ETA: 33s - loss: 7.0542e-04 - acc: 1.0000
495/512 [=====>.] - ETA: 32s - loss: 7.0566e-04 - acc: 1.0000
496/512 [=====>.] - ETA: 30s - loss: 7.0618e-04 - acc: 1.0000
497/512 [=====>.] - ETA: 28s - loss: 7.0621e-04 - acc: 1.0000
498/512 [=====>.] - ETA: 26s - loss: 7.0544e-04 - acc: 1.0000
499/512 [=====>.] - ETA: 24s - loss: 7.0666e-04 - acc: 1.0000
500/512 [=====>.] - ETA: 22s - loss: 7.0631e-04 - acc: 1.0000
501/512 [=====>.] - ETA: 20s - loss: 7.0583e-04 - acc: 1.0000
502/512 [=====>.] - ETA: 18s - loss: 7.0556e-04 - acc: 1.0000
503/512 [=====>.] - ETA: 16s - loss: 7.0505e-04 - acc: 1.0000
504/512 [=====>.] - ETA: 15s - loss: 7.0503e-04 - acc: 1.0000
505/512 [=====>.] - ETA: 13s - loss: 7.0584e-04 - acc: 1.0000
506/512 [=====>.] - ETA: 11s - loss: 7.0612e-04 - acc: 1.0000
507/512 [=====>.] - ETA: 9s - loss: 7.0565e-04 - acc: 1.0000
508/512 [=====>.] - ETA: 7s - loss: 7.0523e-04 - acc: 1.0000
509/512 [=====>.] - ETA: 5s - loss: 7.0564e-04 - acc: 1.0000
510/512 [=====>.] - ETA: 3s - loss: 7.0539e-04 - acc: 1.0000
511/512 [=====>.] - ETA: 1s - loss: 7.0501e-04 - acc: 1.0000
512/512 [=====] - ETA: 0s - loss: 7.0511e-04 - acc: 1.0000
Epoch 00015: val_loss did not improve from 1.15495

512/512 [=====] - 989s 2s/step - loss: 7.0511e-04 - acc: 1.0000 - val_loss: 1.2439 - val_acc: 0.7193
[Finished in 14806.16s]
```

Test 4

```
Python - test.py:1 ✓

2020-09-26 18:35:50.615917: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
Number of Breed: 120
2020-09-26 18:35:59.393827: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library nvcuda.dll
2020-09-26 18:35:59.413662: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1716] Found device 0 with properties:
pciBusID: 0000:01:00.0 name: GeForce GTX 980 Ti computeCapability: 5.2
coreClock: 1.2405GHz coreCount: 22 deviceMemorySize: 6.00GiB deviceMemoryBandwidth: 313.37GiB/s
2020-09-26 18:35:59.414014: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudart64_101.dll
2020-09-26 18:35:59.415360: W tensorflow/stream_executor/platform/default/dso_loader.cc:59] Could not load dynamic library 'cublas64_10.dll'; dlerror: cublas64_10.dll not found
2020-09-26 18:35:59.419236: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cufft64_10.dll
2020-09-26 18:35:59.420524: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library curand64_10.dll
2020-09-26 18:35:59.425401: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cusolver64_10.dll
2020-09-26 18:35:59.427899: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cusparse64_10.dll
2020-09-26 18:35:59.436328: I tensorflow/stream_executor/platform/default/dso_loader.cc:48] Successfully opened dynamic library cudnn64_7.dll
2020-09-26 18:35:59.436489: W tensorflow/core/common_runtime/gpu/gpu_device.cc:1753] Cannot dlopen some GPU libraries. Please make sure the missing libraries mentioned above are installed properly if you
Skipping registering GPU devices...

2020-09-26 18:35:59.437252: I tensorflow/core/platform/cpu_feature_guard.cc:142] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instructions
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.

2020-09-26 18:35:59.448802: I tensorflow/compiler/xla/service/service.cc:168] XLA service 0x1f5dd3feea0 initialized for platform Host (this does not guarantee that XLA will be used). Devices:
2020-09-26 18:35:59.449149: I tensorflow/compiler/xla/service/service.cc:176] StreamExecutor device (0): Host, Default Version
2020-09-26 18:35:59.449372: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1257] Device interconnect StreamExecutor with strength 1 edge matrix:
2020-09-26 18:35:59.449538: I tensorflow/core/common_runtime/gpu/gpu_device.cc:1263]
0it [00:00, ?it/s]
1it [00:00, 1.35it/s]
3it [00:00, 1.87it/s]
5it [00:00, 2.54it/s]
7it [00:01, 3.42it/s]
9it [00:01, 4.48it/s]
11it [00:01, 5.72it/s]
13it [00:01, 7.05it/s]
15it [00:01, 8.50it/s]
17it [00:01, 9.93it/s]
19it [00:01, 10.34it/s]
20it [00:01, 10.19it/s]
[Finished in 13.698s]
```

Test 4

yorkshire_terrrier

yorkshire_terrrier



toy_terrrier

toy_terrrier



afghan_hound

afghan_hound



irish_water_spaniel

irish_water_spaniel



german_short-haired_pointer

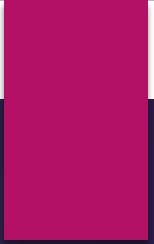
german_short-haired_pointer



chesapeake_bay_retriever

chesapeake_bay_retriever





Thank You !

ANY QUESTIONS?