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General (S

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[AI-21] Ab

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driverstate

BERT Expl

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kaggle.com/jaswanthreddysareddy/driverstate-vgg16/edit

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driverstate(vgg16)

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Draft Session (6h:15m)

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import tensorflow as tf

from tensorflow.keras import Sequential,Model

from tensorflow.keras.layers import Dense,Dropout,Flatten,BatchNormalization

from tensorflow.keras.preprocessing.image import ImageDataGenerator

from keras.applications.vgg16 import VGG16

from keras.applications.mobilenet import preprocess_input

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

[13]:

img_width=224

img_height=224

batch_size=10

[14]:

import pandas as pd

df=pd.read_csv('../input/state-farm-distracted-driver-detection/driver_imgs_list.csv')

df.head()

Out[14]:

subject	classname	img
0	688	0
1	11788	1

2

Console

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driverstate_detectio....h5

driverstate_detection.h5

state-farm-distract....zip

kaggle (1).json

kaggle.json

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input (702 KB)

state-farm-distracted-driver-d...

imgs

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Code Help

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ENG

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```
import pandas as pd
df=pd.read_csv('../input/state-farm-distracted-driver-detection/driver_imgs_list.csv')
df.head()
```

Out[14]:

	subject	classname	img
0	p002	c0	img_44733.jpg
1	p002	c0	img_72999.jpg
2	p002	c0	img_25094.jpg
3	p002	c0	img_69092.jpg
4	p002	c0	img_92629.jpg

+ Code

+ Markdown

[15]:

```
# Initializing training dataset
datagen = ImageDataGenerator(rescale=1.0/255,
                             zoom_range=0.2,
                             horizontal_flip=True,
                             validation_split=0.3)
train = datagen.flow_from_directory(directory='../input/state-farm-distracted-driver-detection/imgs/train',
                                   target_size = (img_width, img_height),
                                   batch_size=batch_size, subset='training')
validation=datagen.flow_from_directory(directory='../input/state-farm-distracted-driver-detection/imgs/train',
                                       target_size=(img_width,img_height),
                                       batch_size=batch_size, subset='validation')
```

File explorer showing project structure:

- input (102 KB)
 - state-farm-distracted-driver-d...
 - imgs
 - test
 - train
 - driver_imgs_list.csv
 - sample_submission.csv
 - output
 - /kaggle/working
 - driverstate_detection_vgg16.h5

Settings and Code Help section.

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Console

driverstate(vgg16) Draft saved

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Draft Session (6h:15m)

Found 15702 images belonging to 10 classes.
Found 6722 images belonging to 10 classes.

[16]:
importing VGG16 model
vgg_arch=VGG16(input_shape=(img_width,img_height,3),weights="imagenet",include_top=False) #include_top= False represents that c

Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/vgg16/vgg16_weights_tf_dim_ordering_tf_kernels_notop.h5
58892288/58889256 [=====] - 0s 0us/step

[17]:
vgg_arch.summary()

Model: "vgg16"

Layer (type) Output Shape Param #

input_1 (InputLayer) [(None, 224, 224, 3)] 0

Console

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```
[18]: # Freezing the layer so that not to update the weights
      for layers in vgg_arch.layers:
          layers.trainable=False
```

```
[19]: # Training the model
      model=Sequential()
      model.add(vgg_arch)
      model.add(Flatten())
      model.add(Dense(128,activation='relu',))
      model.add(Dense(256,activation='relu',))
      #model.add(Dropout(0.5))
      #model.add(BatchNormalization())
      model.add(Dense(10,activation="softmax"))
```

```
[20]: model.compile(optimizer="adam",loss="categorical_crossentropy",metrics=['accuracy'])
```

```
[21]: history=model.fit_generator(generator=train, steps_per_epoch=len(train), epochs = 3,
```


driverstate(vgg16)

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Draft Session (6h:16m)

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```
[21]: history=model.fit_generator(generator=train, steps_per_epoch=len(train), epochs = 3,
                                validation_data=validation, validation_steps=len(validation)
                                , verbose = 1)
```

```
Epoch 1/3
1571/1571 [=====] - 6380s 4s/step - loss: 0.6805 - accuracy: 0.7711 - val_loss: 0.2673 - val_accuracy: 0.9125
Epoch 2/3
1571/1571 [=====] - 6362s 4s/step - loss: 0.2181 - accuracy: 0.9312 - val_loss: 0.1548 - val_accuracy: 0.9514
Epoch 3/3
1571/1571 [=====] - 6250s 4s/step - loss: 0.1727 - accuracy: 0.9450 - val_loss: 0.2320 - val_accuracy: 0.9290
```

```
[22]: classes=['Safe driving','Texting-right','Talking on phone-right','Texting-left','Talking on phone-left','Operating the radio',
              'Drinking','Reaching behind','Hair and makeup','Talking to passenger']
```

```
[23]: from tensorflow.keras.preprocessing import image
```

Console

input (1024x1024)

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driverstate_detection.h5

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kaggle (1).json

kaggle.json

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driverstate(vgg16)

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```
[23]: from tensorflow.keras.preprocessing import image
```

```
[24]: img=image.load_img('../input/state-farm-distracted-driver-detection/imgs/test/img_10001.jpg',target_size=(img_width,img_height))
print(img.size)
plt.imshow(img)
img=image.img_to_array(img)
img=img/255.0
img = np.expand_dims(img, axis=0)
img_class = np.argmax(model.predict(img),axis=1)
```

(224, 224)



Console

- input (102.0B)
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driverstate_detection.h5

state-farm-distract....zip

kaggle (1).json

kaggle.json

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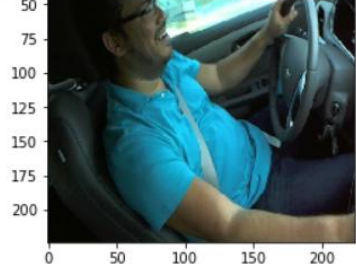
driverstate(vgg16) Draft saved

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state-farm-distracted-driver-d...

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```
[25]: print(np.argmax(model.predict(img)))
      print(classes[np.argmax(model.predict(img))])
```

```
5
Operating the radio
```

```
[26]: model.save('driverstate_detection_vgg16.h5')
```

```
[1]:
```

Console