

CarStyle

October 2, 2024

```
[1]: import tensorflow as tf
import os
import cv2
import math
import json
import numpy as np
from matplotlib import pyplot as plt
from keras.applications import EfficientNetV2S
from keras.models import Model
from keras.layers import Dense, GlobalAveragePooling2D
from keras.metrics import Precision, Recall, SparseCategoricalAccuracy

[2]: print("Num GPUs Available: ", len(tf.config.list_physical_devices('GPU')))
gpus = tf.config.experimental.list_physical_devices('GPU')
if gpus:
    try:
        for gpu in gpus:
            tf.config.experimental.set_memory_growth(gpu, True)
        logical_gpus = tf.config.experimental.list_logical_devices('GPU')
        print(len(gpus), "Physical GPUs,", len(logical_gpus), "Logical GPUs")
    except RuntimeError as e:
        print(e)
```

```
Num GPUs Available:  1
1 Physical GPUs, 1 Logical GPUs
```

```
[3]: base_dir = 'Styles'
train_dir = os.path.join(base_dir, 'train')
val_dir = os.path.join(base_dir, 'valid')
test_dir = os.path.join(base_dir, 'test')

img_size = (224, 224)
batch_size = 32

train_data = tf.keras.utils.image_dataset_from_directory(
    train_dir,
    image_size=img_size,
    batch_size=batch_size,
```

```

        label_mode='int',
        interpolation='bilinear'
    )

    val_data = tf.keras.utils.image_dataset_from_directory(
        val_dir,
        image_size=img_size,
        batch_size=batch_size,
        label_mode='int',
        interpolation='bilinear'
    )

    test_data = tf.keras.utils.image_dataset_from_directory(
        test_dir,
        image_size=img_size,
        batch_size=batch_size,
        label_mode='int',
        interpolation='bilinear'
    )

```

Found 5350 files belonging to 7 classes.
 Found 1397 files belonging to 7 classes.
 Found 802 files belonging to 7 classes.

```

[4]: class_names = train_data.class_names
    print("Class names test:", class_names)

    with open('CarStyle map.json', 'w') as f:
        json.dump(class_names, f)

    data_iterator = train_data.as_numpy_iterator()

```

Class names test: ['Convertible', 'Coupe', 'Hatchback', 'Pick-Up', 'SUV', 'Sedan', 'VAN']

```

[5]: batch = data_iterator.next()
    num_classes = len(class_names)

```

```

[6]: ncols = 4
    nrows = math.ceil(num_classes / ncols)
    fig, ax = plt.subplots(nrows=nrows, ncols=ncols, figsize=(20, 20))

    if nrows == 1:
        ax = ax.flatten()
    elif ncols == 1:
        ax = ax.flatten()

    plotted = set()

```

```

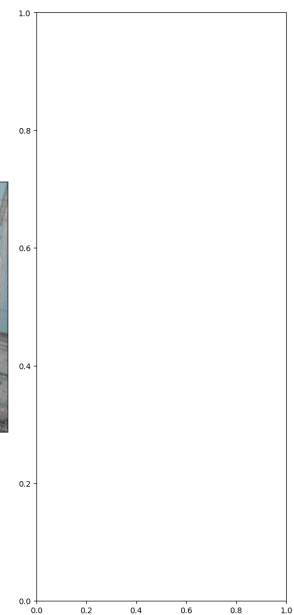
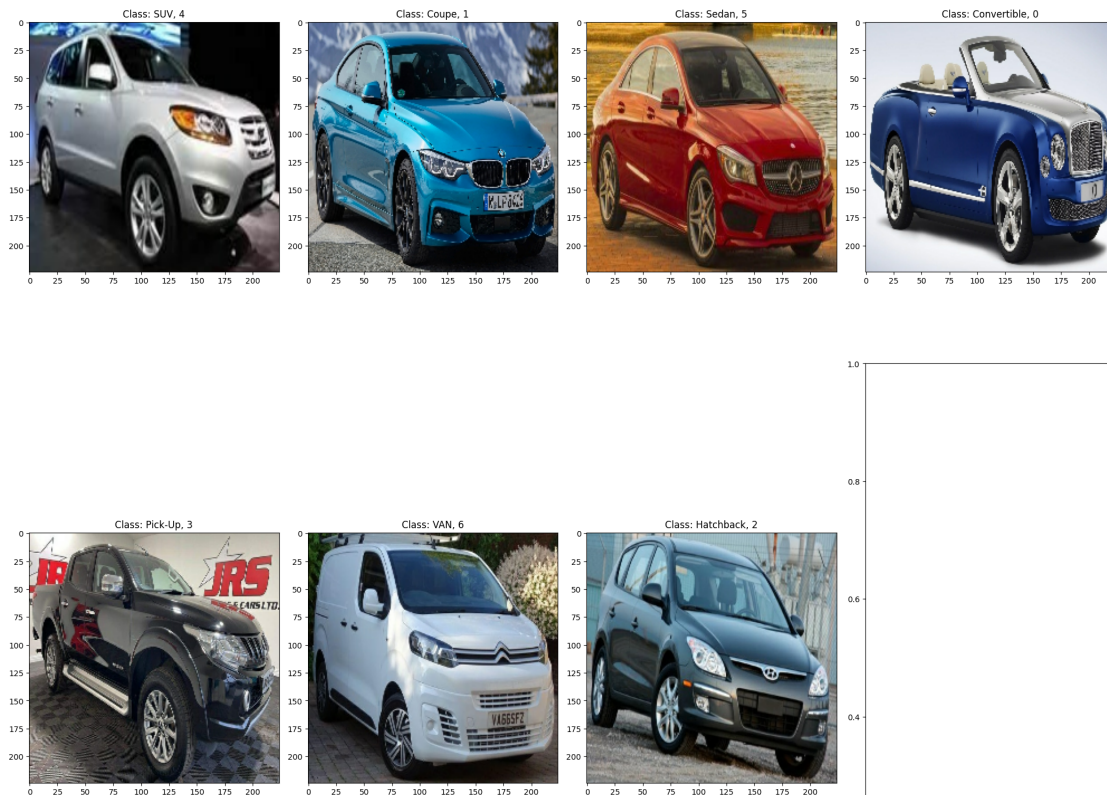
count = 0
while count < num_classes:
    batch = next(data_iterator)

    for idx, img in enumerate(batch[0]):
        label = batch[1][idx]
        if label not in plotted:
            ax_idx = count if nrows == 1 or ncols == 1 else (count // ncols,
↪count % ncols)
            ax[ax_idx].imshow(img.astype(int))
            ax[ax_idx].title.set_text(f"Class: {class_names[label]}, {label}")
            plotted.add(label)
            count += 1

    if count == num_classes:
        break

plt.tight_layout()
plt.show()

```



```
[7]: base_model = EfficientNetV2S(
      weights='imagenet',
      include_top=False,
      input_shape=(224, 224, 3)
    )
    base_model.summary()
```

Downloading data from https://storage.googleapis.com/tensorflow/keras-applications/efficientnet_v2/efficientnetv2-s_notop.h5
82420632/82420632 [=====] - 2s 0us/step
Model: "efficientnetv2-s"

Layer (type)	Output Shape	Param #	Connected to
input_1 (InputLayer)	[(None, 224, 224, 3)]	0	[]
rescaling (Rescaling) ['input_1[0][0]']	(None, 224, 224, 3)	0	
stem_conv (Conv2D) ['rescaling[0][0]']	(None, 112, 112, 24)	648	
stem_bn (BatchNormalization) ['stem_conv[0][0]']	(None, 112, 112, 24)	96	
stem_activation (Activation) ['stem_bn[0][0]']	(None, 112, 112, 24)	0	
block1a_project_conv (Conv2D) ['stem_activation[0][0]']	(None, 112, 112, 24)	5184	
block1a_project_bn (BatchNormalization) ['block1a_project_conv[0][0]']	(None, 112, 112, 24)	96	
block1a_project_activation (Activation) ['block1a_project_bn[0][0]']	(None, 112, 112, 24)	0	

```

    block1a_add (Add) (None, 112, 112, 24 0
['block1a_project_activation[0][0]
    )
    ],
    'stem_activation[0][0]')

    block1b_project_conv (Conv2D) (None, 112, 112, 24 5184
['block1a_add[0][0]')
    )

    block1b_project_bn (BatchNorma (None, 112, 112, 24 96
['block1b_project_conv[0][0]')
    lization)
    )

    block1b_project_activation (Ac (None, 112, 112, 24 0
['block1b_project_bn[0][0]')
    tivation)
    )

    block1b_drop (Dropout) (None, 112, 112, 24 0
['block1b_project_activation[0][0]
    )
    ]

    block1b_add (Add) (None, 112, 112, 24 0
['block1b_drop[0][0]',
    )
    'block1a_add[0][0]')

    block2a_expand_conv (Conv2D) (None, 56, 56, 96) 20736
['block1b_add[0][0]')

    block2a_expand_bn (BatchNormal (None, 56, 56, 96) 384
['block2a_expand_conv[0][0]')
    ization)

    block2a_expand_activation (Act (None, 56, 56, 96) 0
['block2a_expand_bn[0][0]')
    ivation)

    block2a_project_conv (Conv2D) (None, 56, 56, 48) 4608
['block2a_expand_activation[0][0]
    ]

    block2a_project_bn (BatchNorma (None, 56, 56, 48) 192
['block2a_project_conv[0][0]')
    lization)

    block2b_expand_conv (Conv2D) (None, 56, 56, 192) 82944
['block2a_project_bn[0][0]')

```

```

block2b_expand_bn (BatchNormal (None, 56, 56, 192) 768
['block2b_expand_conv[0][0]']
ization)

block2b_expand_activation (Act (None, 56, 56, 192) 0
['block2b_expand_bn[0][0]']
ivation)

block2b_project_conv (Conv2D) (None, 56, 56, 48) 9216
['block2b_expand_activation[0][0]

']

block2b_project_bn (BatchNorma (None, 56, 56, 48) 192
['block2b_project_conv[0][0]']
lization)

block2b_drop (Dropout) (None, 56, 56, 48) 0
['block2b_project_bn[0][0]']

block2b_add (Add) (None, 56, 56, 48) 0
['block2b_drop[0][0]',
'block2a_project_bn[0][0]']

block2c_expand_conv (Conv2D) (None, 56, 56, 192) 82944
['block2b_add[0][0]']

block2c_expand_bn (BatchNormal (None, 56, 56, 192) 768
['block2c_expand_conv[0][0]']
ization)

block2c_expand_activation (Act (None, 56, 56, 192) 0
['block2c_expand_bn[0][0]']
ivation)

block2c_project_conv (Conv2D) (None, 56, 56, 48) 9216
['block2c_expand_activation[0][0]

']

block2c_project_bn (BatchNorma (None, 56, 56, 48) 192
['block2c_project_conv[0][0]']
lization)

block2c_drop (Dropout) (None, 56, 56, 48) 0
['block2c_project_bn[0][0]']

block2c_add (Add) (None, 56, 56, 48) 0
['block2c_drop[0][0]',

```

```

'block2b_add[0][0]']

block2d_expand_conv (Conv2D)    (None, 56, 56, 192)  82944
['block2c_add[0][0]']

block2d_expand_bn (BatchNormal  (None, 56, 56, 192)  768
['block2d_expand_conv[0][0]']
ization)

block2d_expand_activation (Act  (None, 56, 56, 192)  0
['block2d_expand_bn[0][0]']
ivation)

block2d_project_conv (Conv2D)   (None, 56, 56, 48)   9216
['block2d_expand_activation[0][0]

']

block2d_project_bn (BatchNorma  (None, 56, 56, 48)   192
['block2d_project_conv[0][0]']
lization)

block2d_drop (Dropout)          (None, 56, 56, 48)   0
['block2d_project_bn[0][0]']

block2d_add (Add)               (None, 56, 56, 48)   0
['block2d_drop[0][0]',
'block2c_add[0][0]']

block3a_expand_conv (Conv2D)    (None, 28, 28, 192)  82944
['block2d_add[0][0]']

block3a_expand_bn (BatchNormal  (None, 28, 28, 192)  768
['block3a_expand_conv[0][0]']
ization)

block3a_expand_activation (Act  (None, 28, 28, 192)  0
['block3a_expand_bn[0][0]']
ivation)

block3a_project_conv (Conv2D)   (None, 28, 28, 64)   12288
['block3a_expand_activation[0][0]

']

block3a_project_bn (BatchNorma  (None, 28, 28, 64)   256
['block3a_project_conv[0][0]']
lization)

block3b_expand_conv (Conv2D)    (None, 28, 28, 256)  147456

```

```

['block3a_project_bn[0][0]']

block3b_expand_bn (BatchNormal (None, 28, 28, 256) 1024
['block3b_expand_conv[0][0]']
ization)

block3b_expand_activation (Act (None, 28, 28, 256) 0
['block3b_expand_bn[0][0]']
ivation)

block3b_project_conv (Conv2D) (None, 28, 28, 64) 16384
['block3b_expand_activation[0][0]

']

block3b_project_bn (BatchNorma (None, 28, 28, 64) 256
['block3b_project_conv[0][0]']
lization)

block3b_drop (Dropout) (None, 28, 28, 64) 0
['block3b_project_bn[0][0]']

block3b_add (Add) (None, 28, 28, 64) 0
['block3b_drop[0][0]',
'block3a_project_bn[0][0]']

block3c_expand_conv (Conv2D) (None, 28, 28, 256) 147456
['block3b_add[0][0]']

block3c_expand_bn (BatchNormal (None, 28, 28, 256) 1024
['block3c_expand_conv[0][0]']
ization)

block3c_expand_activation (Act (None, 28, 28, 256) 0
['block3c_expand_bn[0][0]']
ivation)

block3c_project_conv (Conv2D) (None, 28, 28, 64) 16384
['block3c_expand_activation[0][0]

']

block3c_project_bn (BatchNorma (None, 28, 28, 64) 256
['block3c_project_conv[0][0]']
lization)

block3c_drop (Dropout) (None, 28, 28, 64) 0
['block3c_project_bn[0][0]']

block3c_add (Add) (None, 28, 28, 64) 0

```



```

['block3c_drop[0][0]',
'block3b_add[0][0]']

    block3d_expand_conv (Conv2D)      (None, 28, 28, 256) 147456
['block3c_add[0][0]']

    block3d_expand_bn (BatchNormal    (None, 28, 28, 256) 1024
['block3d_expand_conv[0][0]']
    ization)

    block3d_expand_activation (Act    (None, 28, 28, 256) 0
['block3d_expand_bn[0][0]']
    ivation)

    block3d_project_conv (Conv2D)     (None, 28, 28, 64) 16384
['block3d_expand_activation[0][0]

    '

    block3d_project_bn (BatchNorma    (None, 28, 28, 64) 256
['block3d_project_conv[0][0]']
    lization)

    block3d_drop (Dropout)            (None, 28, 28, 64) 0
['block3d_project_bn[0][0]']

    block3d_add (Add)                 (None, 28, 28, 64) 0
['block3d_drop[0][0]',
'block3c_add[0][0]']

    block4a_expand_conv (Conv2D)      (None, 28, 28, 256) 16384
['block3d_add[0][0]']

    block4a_expand_bn (BatchNormal    (None, 28, 28, 256) 1024
['block4a_expand_conv[0][0]']
    ization)

    block4a_expand_activation (Act    (None, 28, 28, 256) 0
['block4a_expand_bn[0][0]']
    ivation)

    block4a_dwconv2 (DepthwiseConv    (None, 14, 14, 256) 2304
['block4a_expand_activation[0][0]
    2D)

    '

    block4a_bn (BatchNormalization    (None, 14, 14, 256) 1024
['block4a_dwconv2[0][0]']
    )

```

```

    block4a_activation (Activation (None, 14, 14, 256) 0
['block4a_bn[0][0]']
)

    block4a_se_squeeze (GlobalAveragePooling2D) (None, 256) 0
['block4a_activation[0][0]']

    block4a_se_reshape (Reshape) (None, 1, 1, 256) 0
['block4a_se_squeeze[0][0]']

    block4a_se_reduce (Conv2D) (None, 1, 1, 16) 4112
['block4a_se_reshape[0][0]']

    block4a_se_expand (Conv2D) (None, 1, 1, 256) 4352
['block4a_se_reduce[0][0]']

    block4a_se_excite (Multiply) (None, 14, 14, 256) 0
['block4a_activation[0][0]',
'block4a_se_expand[0][0]']

    block4a_project_conv (Conv2D) (None, 14, 14, 128) 32768
['block4a_se_excite[0][0]']

    block4a_project_bn (BatchNormalization) (None, 14, 14, 128) 512
['block4a_project_conv[0][0]']

    block4b_expand_conv (Conv2D) (None, 14, 14, 512) 65536
['block4a_project_bn[0][0]']

    block4b_expand_bn (BatchNormalization) (None, 14, 14, 512) 2048
['block4b_expand_conv[0][0]']

    block4b_expand_activation (Activation) (None, 14, 14, 512) 0
['block4b_expand_bn[0][0]']

    block4b_dwconv2 (DepthwiseConv2D) (None, 14, 14, 512) 4608
['block4b_expand_activation[0][0]']

    block4b_bn (BatchNormalization) (None, 14, 14, 512) 2048
['block4b_dwconv2[0][0]']

    block4b_activation (Activation) (None, 14, 14, 512) 0

```

```

['block4b_bn[0][0]']
)

block4b_se_squeeze (GlobalAveragePooling2D) (None, 512) 0
['block4b_activation[0][0]']

block4b_se_reshape (Reshape) (None, 1, 1, 512) 0
['block4b_se_squeeze[0][0]']

block4b_se_reduce (Conv2D) (None, 1, 1, 32) 16416
['block4b_se_reshape[0][0]']

block4b_se_expand (Conv2D) (None, 1, 1, 512) 16896
['block4b_se_reduce[0][0]']

block4b_se_excite (Multiply) (None, 14, 14, 512) 0
['block4b_activation[0][0]',
'block4b_se_expand[0][0]']

block4b_project_conv (Conv2D) (None, 14, 14, 128) 65536
['block4b_se_excite[0][0]']

block4b_project_bn (BatchNormalization) (None, 14, 14, 128) 512
['block4b_project_conv[0][0]']

block4b_drop (Dropout) (None, 14, 14, 128) 0
['block4b_project_bn[0][0]']

block4b_add (Add) (None, 14, 14, 128) 0
['block4b_drop[0][0]',
'block4a_project_bn[0][0]']

block4c_expand_conv (Conv2D) (None, 14, 14, 512) 65536
['block4b_add[0][0]']

block4c_expand_bn (BatchNormalization) (None, 14, 14, 512) 2048
['block4c_expand_conv[0][0]']

block4c_expand_activation (Activation) (None, 14, 14, 512) 0
['block4c_expand_bn[0][0]']

block4c_dwconv2 (DepthwiseConv2D) (None, 14, 14, 512) 4608
['block4c_expand_activation[0][0]']
2D)
']

```

```

    block4c_bn (BatchNormalization (None, 14, 14, 512) 2048
['block4c_dwconv2[0][0]']
)

    block4c_activation (Activation (None, 14, 14, 512) 0
['block4c_bn[0][0]']
)

    block4c_se_squeeze (GlobalAveragePooling2D) (None, 512) 0
['block4c_activation[0][0]']

    block4c_se_reshape (Reshape) (None, 1, 1, 512) 0
['block4c_se_squeeze[0][0]']

    block4c_se_reduce (Conv2D) (None, 1, 1, 32) 16416
['block4c_se_reshape[0][0]']

    block4c_se_expand (Conv2D) (None, 1, 1, 512) 16896
['block4c_se_reduce[0][0]']

    block4c_se_excite (Multiply) (None, 14, 14, 512) 0
['block4c_activation[0][0]',
'block4c_se_expand[0][0]']

    block4c_project_conv (Conv2D) (None, 14, 14, 128) 65536
['block4c_se_excite[0][0]']

    block4c_project_bn (BatchNormalization) (None, 14, 14, 128) 512
['block4c_project_conv[0][0]']

    block4c_drop (Dropout) (None, 14, 14, 128) 0
['block4c_project_bn[0][0]']

    block4c_add (Add) (None, 14, 14, 128) 0
['block4c_drop[0][0]',
'block4b_add[0][0]']

    block4d_expand_conv (Conv2D) (None, 14, 14, 512) 65536
['block4c_add[0][0]']

    block4d_expand_bn (BatchNormalization) (None, 14, 14, 512) 2048
['block4d_expand_conv[0][0]']

    block4d_expand_activation (Activation) (None, 14, 14, 512) 0

```

```

['block4d_expand_bn[0][0]']
ivation)

block4d_dwconv2 (DepthwiseConv (None, 14, 14, 512) 4608
['block4d_expand_activation[0][0]
2D)

block4d_bn (BatchNormalization (None, 14, 14, 512) 2048
['block4d_dwconv2[0][0]']
)

block4d_activation (Activation (None, 14, 14, 512) 0
['block4d_bn[0][0]']
)

block4d_se_squeeze (GlobalAver (None, 512) 0
['block4d_activation[0][0]']
agePooling2D)

block4d_se_reshape (Reshape) (None, 1, 1, 512) 0
['block4d_se_squeeze[0][0]']

block4d_se_reduce (Conv2D) (None, 1, 1, 32) 16416
['block4d_se_reshape[0][0]']

block4d_se_expand (Conv2D) (None, 1, 1, 512) 16896
['block4d_se_reduce[0][0]']

block4d_se_excite (Multiply) (None, 14, 14, 512) 0
['block4d_activation[0][0]',
'block4d_se_expand[0][0]']

block4d_project_conv (Conv2D) (None, 14, 14, 128) 65536
['block4d_se_excite[0][0]']

block4d_project_bn (BatchNorma (None, 14, 14, 128) 512
['block4d_project_conv[0][0]']
lization)

block4d_drop (Dropout) (None, 14, 14, 128) 0
['block4d_project_bn[0][0]']

block4d_add (Add) (None, 14, 14, 128) 0
['block4d_drop[0][0]',
'block4c_add[0][0]']

block4e_expand_conv (Conv2D) (None, 14, 14, 512) 65536
['block4d_add[0][0]']

```

```

block4e_expand_bn (BatchNormal (None, 14, 14, 512) 2048
['block4e_expand_conv[0][0]']
ization)

block4e_expand_activation (Act (None, 14, 14, 512) 0
['block4e_expand_bn[0][0]']
ivation)

block4e_dwconv2 (DepthwiseConv (None, 14, 14, 512) 4608
['block4e_expand_activation[0][0]
2D)

block4e_bn (BatchNormalization (None, 14, 14, 512) 2048
['block4e_dwconv2[0][0]']
)

block4e_activation (Activation (None, 14, 14, 512) 0
['block4e_bn[0][0]']
)

block4e_se_squeeze (GlobalAver (None, 512) 0
['block4e_activation[0][0]']
agePooling2D)

block4e_se_reshape (Reshape) (None, 1, 1, 512) 0
['block4e_se_squeeze[0][0]']

block4e_se_reduce (Conv2D) (None, 1, 1, 32) 16416
['block4e_se_reshape[0][0]']

block4e_se_expand (Conv2D) (None, 1, 1, 512) 16896
['block4e_se_reduce[0][0]']

block4e_se_excite (Multiply) (None, 14, 14, 512) 0
['block4e_activation[0][0]',
'block4e_se_expand[0][0]']

block4e_project_conv (Conv2D) (None, 14, 14, 128) 65536
['block4e_se_excite[0][0]']

block4e_project_bn (BatchNorma (None, 14, 14, 128) 512
['block4e_project_conv[0][0]']
lization)

block4e_drop (Dropout) (None, 14, 14, 128) 0
['block4e_project_bn[0][0]']

```

```

    block4e_add (Add) (None, 14, 14, 128) 0
['block4e_drop[0][0]',
'block4d_add[0][0]']

    block4f_expand_conv (Conv2D) (None, 14, 14, 512) 65536
['block4e_add[0][0]']

    block4f_expand_bn (BatchNormal (None, 14, 14, 512) 2048
['block4f_expand_conv[0][0]']
ization)

    block4f_expand_activation (Act (None, 14, 14, 512) 0
['block4f_expand_bn[0][0]']
ivation)

    block4f_dwconv2 (DepthwiseConv (None, 14, 14, 512) 4608
['block4f_expand_activation[0][0]
2D)

    block4f_bn (BatchNormalization (None, 14, 14, 512) 2048
['block4f_dwconv2[0][0]']
)

    block4f_activation (Activation (None, 14, 14, 512) 0
['block4f_bn[0][0]']
)

    block4f_se_squeeze (GlobalAver (None, 512) 0
['block4f_activation[0][0]']
agePooling2D)

    block4f_se_reshape (Reshape) (None, 1, 1, 512) 0
['block4f_se_squeeze[0][0]']

    block4f_se_reduce (Conv2D) (None, 1, 1, 32) 16416
['block4f_se_reshape[0][0]']

    block4f_se_expand (Conv2D) (None, 1, 1, 512) 16896
['block4f_se_reduce[0][0]']

    block4f_se_excite (Multiply) (None, 14, 14, 512) 0
['block4f_activation[0][0]',
'block4f_se_expand[0][0]']

    block4f_project_conv (Conv2D) (None, 14, 14, 128) 65536
['block4f_se_excite[0][0]']

    block4f_project_bn (BatchNorma (None, 14, 14, 128) 512

```

```

['block4f_project_conv[0][0]']
lization)

block4f_drop (Dropout)          (None, 14, 14, 128) 0
['block4f_project_bn[0][0]']

block4f_add (Add)                (None, 14, 14, 128) 0
['block4f_drop[0][0]',
'block4e_add[0][0]']

block5a_expand_conv (Conv2D)     (None, 14, 14, 768) 98304
['block4f_add[0][0]']

block5a_expand_bn (BatchNormal   (None, 14, 14, 768) 3072
['block5a_expand_conv[0][0]']
ization)

block5a_expand_activation (Act   (None, 14, 14, 768) 0
['block5a_expand_bn[0][0]']
ivation)

block5a_dwconv2 (DepthwiseConv   (None, 14, 14, 768) 6912
['block5a_expand_activation[0][0]
2D)

block5a_bn (BatchNormalization   (None, 14, 14, 768) 3072
['block5a_dwconv2[0][0]']
)

block5a_activation (Activation   (None, 14, 14, 768) 0
['block5a_bn[0][0]']
)

block5a_se_squeeze (GlobalAver   (None, 768) 0
['block5a_activation[0][0]']
agePooling2D)

block5a_se_reshape (Reshape)     (None, 1, 1, 768) 0
['block5a_se_squeeze[0][0]']

block5a_se_reduce (Conv2D)       (None, 1, 1, 32) 24608
['block5a_se_reshape[0][0]']

block5a_se_expand (Conv2D)       (None, 1, 1, 768) 25344
['block5a_se_reduce[0][0]']

block5a_se_excite (Multiply)     (None, 14, 14, 768) 0
['block5a_activation[0][0]',

```



```

'block5a_se_expand[0][0]']

block5a_project_conv (Conv2D) (None, 14, 14, 160) 122880
['block5a_se_excite[0][0]']

block5a_project_bn (BatchNormal (None, 14, 14, 160) 640
['block5a_project_conv[0][0]']
lization)

block5b_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block5a_project_bn[0][0]']

block5b_expand_bn (BatchNormal (None, 14, 14, 960) 3840
['block5b_expand_conv[0][0]']
lization)

block5b_expand_activation (Act (None, 14, 14, 960) 0
['block5b_expand_bn[0][0]']
ivation)

block5b_dwconv2 (DepthwiseConv (None, 14, 14, 960) 8640
['block5b_expand_activation[0][0]
2D)

block5b_bn (BatchNormalization (None, 14, 14, 960) 3840
['block5b_dwconv2[0][0]']
)

block5b_activation (Activation (None, 14, 14, 960) 0
['block5b_bn[0][0]']
)

block5b_se_squeeze (GlobalAver (None, 960) 0
['block5b_activation[0][0]']
agePooling2D)

block5b_se_reshape (Reshape) (None, 1, 1, 960) 0
['block5b_se_squeeze[0][0]']

block5b_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block5b_se_reshape[0][0]']

block5b_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block5b_se_reduce[0][0]']

block5b_se_excite (Multiply) (None, 14, 14, 960) 0
['block5b_activation[0][0]',
'block5b_se_expand[0][0]']

```

```

    block5b_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block5b_se_excite[0][0]']

    block5b_project_bn (BatchNormal (None, 14, 14, 160) 640
['block5b_project_conv[0][0]']
    ization)

    block5b_drop (Dropout) (None, 14, 14, 160) 0
['block5b_project_bn[0][0]']

    block5b_add (Add) (None, 14, 14, 160) 0
['block5b_drop[0][0]',
'block5a_project_bn[0][0]']

    block5c_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block5b_add[0][0]']

    block5c_expand_bn (BatchNormal (None, 14, 14, 960) 3840
['block5c_expand_conv[0][0]']
    ization)

    block5c_expand_activation (Act (None, 14, 14, 960) 0
['block5c_expand_bn[0][0]']
    ivation)

    block5c_dwconv2 (DepthwiseConv (None, 14, 14, 960) 8640
['block5c_expand_activation[0][0]
2D)

    block5c_bn (BatchNormalization (None, 14, 14, 960) 3840
['block5c_dwconv2[0][0]']
    )

    block5c_activation (Activation (None, 14, 14, 960) 0
['block5c_bn[0][0]']
    )

    block5c_se_squeeze (GlobalAver (None, 960) 0
['block5c_activation[0][0]']
    agePooling2D)

    block5c_se_reshape (Reshape) (None, 1, 1, 960) 0
['block5c_se_squeeze[0][0]']

    block5c_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block5c_se_reshape[0][0]']

```

```

    block5c_se_expand (Conv2D)      (None, 1, 1, 960)    39360
['block5c_se_reduce[0][0]']

    block5c_se_excite (Multiply)    (None, 14, 14, 960)  0
['block5c_activation[0][0]',
'block5c_se_expand[0][0]']

    block5c_project_conv (Conv2D)   (None, 14, 14, 160)  153600
['block5c_se_excite[0][0]']

    block5c_project_bn (BatchNorma  (None, 14, 14, 160)  640
['block5c_project_conv[0][0]']
lization)

    block5c_drop (Dropout)          (None, 14, 14, 160)  0
['block5c_project_bn[0][0]']

    block5c_add (Add)               (None, 14, 14, 160)  0
['block5c_drop[0][0]',
'block5b_add[0][0]']

    block5d_expand_conv (Conv2D)    (None, 14, 14, 960)  153600
['block5c_add[0][0]']

    block5d_expand_bn (BatchNormal  (None, 14, 14, 960)  3840
['block5d_expand_conv[0][0]']
lization)

    block5d_expand_activation (Act  (None, 14, 14, 960)  0
['block5d_expand_bn[0][0]']
ivation)

    block5d_dwconv2 (DepthwiseConv  (None, 14, 14, 960)  8640
['block5d_expand_activation[0][0]
2D)

    block5d_bn (BatchNormalization  (None, 14, 14, 960)  3840
['block5d_dwconv2[0][0]']
)

    block5d_activation (Activation  (None, 14, 14, 960)  0
['block5d_bn[0][0]']
)

    block5d_se_squeeze (GlobalAver  (None, 960)          0
['block5d_activation[0][0]']
agePooling2D)
']

```

```

    block5d_se_reshape (Reshape)      (None, 1, 1, 960)      0
['block5d_se_squeeze[0][0]']

    block5d_se_reduce (Conv2D)        (None, 1, 1, 40)      38440
['block5d_se_reshape[0][0]']

    block5d_se_expand (Conv2D)        (None, 1, 1, 960)      39360
['block5d_se_reduce[0][0]']

    block5d_se_excite (Multiply)      (None, 14, 14, 960)    0
['block5d_activation[0][0]',
'block5d_se_expand[0][0]']

    block5d_project_conv (Conv2D)     (None, 14, 14, 160)    153600
['block5d_se_excite[0][0]']

    block5d_project_bn (BatchNormal   (None, 14, 14, 160)    640
['block5d_project_conv[0][0]']
lization)

    block5d_drop (Dropout)            (None, 14, 14, 160)    0
['block5d_project_bn[0][0]']

    block5d_add (Add)                 (None, 14, 14, 160)    0
['block5d_drop[0][0]',
'block5c_add[0][0]']

    block5e_expand_conv (Conv2D)      (None, 14, 14, 960)    153600
['block5d_add[0][0]']

    block5e_expand_bn (BatchNormal    (None, 14, 14, 960)    3840
['block5e_expand_conv[0][0]']
lization)

    block5e_expand_activation (Act     (None, 14, 14, 960)    0
['block5e_expand_bn[0][0]']
ivation)

    block5e_dwconv2 (DepthwiseConv    (None, 14, 14, 960)    8640
['block5e_expand_activation[0][0]
2D)

    block5e_bn (BatchNormalization    (None, 14, 14, 960)    3840
['block5e_dwconv2[0][0]']
)

    block5e_activation (Activation     (None, 14, 14, 960)    0
['block5e_bn[0][0]']

```

```

)

block5e_se_squeeze (GlobalAveragePooling2D) (None, 960) 0
['block5e_activation[0][0]']

block5e_se_reshape (Reshape) (None, 1, 1, 960) 0
['block5e_se_squeeze[0][0]']

block5e_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block5e_se_reshape[0][0]']

block5e_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block5e_se_reduce[0][0]']

block5e_se_excite (Multiply) (None, 14, 14, 960) 0
['block5e_activation[0][0]',
'block5e_se_expand[0][0]']

block5e_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block5e_se_excite[0][0]']

block5e_project_bn (BatchNormalization) (None, 14, 14, 160) 640
['block5e_project_conv[0][0]']

block5e_drop (Dropout) (None, 14, 14, 160) 0
['block5e_project_bn[0][0]']

block5e_add (Add) (None, 14, 14, 160) 0
['block5e_drop[0][0]',
'block5d_add[0][0]']

block5f_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block5e_add[0][0]']

block5f_expand_bn (BatchNormalization) (None, 14, 14, 960) 3840
['block5f_expand_conv[0][0]']

block5f_expand_activation (Activation) (None, 14, 14, 960) 0
['block5f_expand_bn[0][0]']

block5f_dwconv2 (DepthwiseConv2D) (None, 14, 14, 960) 8640
['block5f_expand_activation[0][0]']
2D)
']

```

```

    block5f_bn (BatchNormalization (None, 14, 14, 960) 3840
['block5f_dwconv2[0][0]']
)

    block5f_activation (Activation (None, 14, 14, 960) 0
['block5f_bn[0][0]']
)

    block5f_se_squeeze (GlobalAveragePooling2D) (None, 960) 0
['block5f_activation[0][0]']

    block5f_se_reshape (Reshape) (None, 1, 1, 960) 0
['block5f_se_squeeze[0][0]']

    block5f_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block5f_se_reshape[0][0]']

    block5f_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block5f_se_reduce[0][0]']

    block5f_se_excite (Multiply) (None, 14, 14, 960) 0
['block5f_activation[0][0]',
'block5f_se_expand[0][0]']

    block5f_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block5f_se_excite[0][0]']

    block5f_project_bn (BatchNormalization) (None, 14, 14, 160) 640
['block5f_project_conv[0][0]']

    block5f_drop (Dropout) (None, 14, 14, 160) 0
['block5f_project_bn[0][0]']

    block5f_add (Add) (None, 14, 14, 160) 0
['block5f_drop[0][0]',
'block5e_add[0][0]']

    block5g_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block5f_add[0][0]']

    block5g_expand_bn (BatchNormalization) (None, 14, 14, 960) 3840
['block5g_expand_conv[0][0]']

    block5g_expand_activation (Activation) (None, 14, 14, 960) 0
['block5g_expand_bn[0][0]']

```

```

ivation)

block5g_dwconv2 (DepthwiseConv (None, 14, 14, 960) 8640
['block5g_expand_activation[0][0]
2D)

block5g_bn (BatchNormalization (None, 14, 14, 960) 3840
['block5g_dwconv2[0][0]')

block5g_activation (Activation (None, 14, 14, 960) 0
['block5g_bn[0][0]')

block5g_se_squeeze (GlobalAveragePooling2D) (None, 960) 0
['block5g_activation[0][0]']

block5g_se_reshape (Reshape) (None, 1, 1, 960) 0
['block5g_se_squeeze[0][0]']

block5g_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block5g_se_reshape[0][0]']

block5g_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block5g_se_reduce[0][0]']

block5g_se_excite (Multiply) (None, 14, 14, 960) 0
['block5g_activation[0][0]',
'block5g_se_expand[0][0]']

block5g_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block5g_se_excite[0][0]']

block5g_project_bn (BatchNormalization) (None, 14, 14, 160) 640
['block5g_project_conv[0][0]']

block5g_drop (Dropout) (None, 14, 14, 160) 0
['block5g_project_bn[0][0]']

block5g_add (Add) (None, 14, 14, 160) 0
['block5g_drop[0][0]',
'block5f_add[0][0]']

block5h_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block5g_add[0][0]']

```

```

    block5h_expand_bn (BatchNormal (None, 14, 14, 960) 3840
['block5h_expand_conv[0][0] ']
    ization)

    block5h_expand_activation (Act (None, 14, 14, 960) 0
['block5h_expand_bn[0][0] ']
    ivation)

    block5h_dwconv2 (DepthwiseConv (None, 14, 14, 960) 8640
['block5h_expand_activation[0][0]
    2D)
']

    block5h_bn (BatchNormalization (None, 14, 14, 960) 3840
['block5h_dwconv2[0][0] ']
    )

    block5h_activation (Activation (None, 14, 14, 960) 0
['block5h_bn[0][0] ']
    )

    block5h_se_squeeze (GlobalAver (None, 960) 0
['block5h_activation[0][0] ']
    agePooling2D)

    block5h_se_reshape (Reshape) (None, 1, 1, 960) 0
['block5h_se_squeeze[0][0] ']

    block5h_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block5h_se_reshape[0][0] ']

    block5h_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block5h_se_reduce[0][0] ']

    block5h_se_excite (Multiply) (None, 14, 14, 960) 0
['block5h_activation[0][0] ',
'block5h_se_expand[0][0] ']

    block5h_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block5h_se_excite[0][0] ']

    block5h_project_bn (BatchNorma (None, 14, 14, 160) 640
['block5h_project_conv[0][0] ']
    lization)

    block5h_drop (Dropout) (None, 14, 14, 160) 0
['block5h_project_bn[0][0] ']

    block5h_add (Add) (None, 14, 14, 160) 0

```



```

['block5h_drop[0][0]',
'block5g_add[0][0]']

block5i_expand_conv (Conv2D) (None, 14, 14, 960) 153600
['block5h_add[0][0]']

block5i_expand_bn (BatchNormal (None, 14, 14, 960) 3840
['block5i_expand_conv[0][0]']
ization)

block5i_expand_activation (Act (None, 14, 14, 960) 0
['block5i_expand_bn[0][0]']
ivation)

block5i_dwconv2 (DepthwiseConv (None, 14, 14, 960) 8640
['block5i_expand_activation[0][0]
2D)

block5i_bn (BatchNormalization (None, 14, 14, 960) 3840
['block5i_dwconv2[0][0]']
)

block5i_activation (Activation (None, 14, 14, 960) 0
['block5i_bn[0][0]']
)

block5i_se_squeeze (GlobalAver (None, 960) 0
['block5i_activation[0][0]']
agePooling2D)

block5i_se_reshape (Reshape) (None, 1, 1, 960) 0
['block5i_se_squeeze[0][0]']

block5i_se_reduce (Conv2D) (None, 1, 1, 40) 38440
['block5i_se_reshape[0][0]']

block5i_se_expand (Conv2D) (None, 1, 1, 960) 39360
['block5i_se_reduce[0][0]']

block5i_se_excite (Multiply) (None, 14, 14, 960) 0
['block5i_activation[0][0]',
'block5i_se_expand[0][0]']

block5i_project_conv (Conv2D) (None, 14, 14, 160) 153600
['block5i_se_excite[0][0]']

block5i_project_bn (BatchNorma (None, 14, 14, 160) 640
['block5i_project_conv[0][0]']

```

```

lization)

block5i_drop (Dropout)          (None, 14, 14, 160)  0
['block5i_project_bn[0][0]']

block5i_add (Add)               (None, 14, 14, 160)  0
['block5i_drop[0][0]',
'block5h_add[0][0]']

block6a_expand_conv (Conv2D)    (None, 14, 14, 960) 153600
['block5i_add[0][0]']

block6a_expand_bn (BatchNormal (None, 14, 14, 960) 3840
['block6a_expand_conv[0][0]']
ization)

block6a_expand_activation (Act (None, 14, 14, 960)  0
['block6a_expand_bn[0][0]']
ivation)

block6a_dwconv2 (DepthwiseConv (None, 7, 7, 960)   8640
['block6a_expand_activation[0][0]
2D)

block6a_bn (BatchNormalization (None, 7, 7, 960)   3840
['block6a_dwconv2[0][0]']
)

block6a_activation (Activation (None, 7, 7, 960)   0
['block6a_bn[0][0]']
)

block6a_se_squeeze (GlobalAver (None, 960)          0
['block6a_activation[0][0]']
agePooling2D)

block6a_se_reshape (Reshape)    (None, 1, 1, 960)   0
['block6a_se_squeeze[0][0]']

block6a_se_reduce (Conv2D)      (None, 1, 1, 40)    38440
['block6a_se_reshape[0][0]']

block6a_se_expand (Conv2D)      (None, 1, 1, 960)    39360
['block6a_se_reduce[0][0]']

block6a_se_excite (Multiply)    (None, 7, 7, 960)   0
['block6a_activation[0][0]',
'block6a_se_expand[0][0]']

```

block6a_project_conv (Conv2D)	(None, 7, 7, 256)	245760
['block6a_se_excite[0][0]']		
block6a_project_bn (BatchNormalization)	(None, 7, 7, 256)	1024
['block6a_project_conv[0][0]']		
block6b_expand_conv (Conv2D)	(None, 7, 7, 1536)	393216
['block6a_project_bn[0][0]']		
block6b_expand_bn (BatchNormalization)	(None, 7, 7, 1536)	6144
['block6b_expand_conv[0][0]']		
block6b_expand_activation (Activation)	(None, 7, 7, 1536)	0
['block6b_expand_bn[0][0]']		
block6b_dwconv2 (DepthwiseConv2D)	(None, 7, 7, 1536)	13824
['block6b_expand_activation[0][0]']		
block6b_bn (BatchNormalization)	(None, 7, 7, 1536)	6144
['block6b_dwconv2[0][0]']		
block6b_activation (Activation)	(None, 7, 7, 1536)	0
['block6b_bn[0][0]']		
block6b_se_squeeze (GlobalAveragePooling2D)	(None, 1536)	0
['block6b_activation[0][0]']		
block6b_se_reshape (Reshape)	(None, 1, 1, 1536)	0
['block6b_se_squeeze[0][0]']		
block6b_se_reduce (Conv2D)	(None, 1, 1, 64)	98368
['block6b_se_reshape[0][0]']		
block6b_se_expand (Conv2D)	(None, 1, 1, 1536)	99840
['block6b_se_reduce[0][0]']		
block6b_se_excite (Multiply)	(None, 7, 7, 1536)	0
['block6b_activation[0][0]', 'block6b_se_expand[0][0]']		

block6b_project_conv (Conv2D)	(None, 7, 7, 256)	393216
['block6b_se_excite[0][0]']		
block6b_project_bn (BatchNormal	(None, 7, 7, 256)	1024
['block6b_project_conv[0][0]']		
ization)		
block6b_drop (Dropout)	(None, 7, 7, 256)	0
['block6b_project_bn[0][0]']		
block6b_add (Add)	(None, 7, 7, 256)	0
['block6b_drop[0][0]',		
'block6a_project_bn[0][0]']		
block6c_expand_conv (Conv2D)	(None, 7, 7, 1536)	393216
['block6b_add[0][0]']		
block6c_expand_bn (BatchNormal	(None, 7, 7, 1536)	6144
['block6c_expand_conv[0][0]']		
ization)		
block6c_expand_activation (Act	(None, 7, 7, 1536)	0
['block6c_expand_bn[0][0]']		
ivation)		
block6c_dwconv2 (DepthwiseConv	(None, 7, 7, 1536)	13824
['block6c_expand_activation[0][0]		
2D)		
block6c_bn (BatchNormalization	(None, 7, 7, 1536)	6144
['block6c_dwconv2[0][0]']		
)		
block6c_activation (Activation	(None, 7, 7, 1536)	0
['block6c_bn[0][0]']		
)		
block6c_se_squeeze (GlobalAver	(None, 1536)	0
['block6c_activation[0][0]']		
agePooling2D)		
block6c_se_reshape (Reshape)	(None, 1, 1, 1536)	0
['block6c_se_squeeze[0][0]']		
block6c_se_reduce (Conv2D)	(None, 1, 1, 64)	98368
['block6c_se_reshape[0][0]']		
block6c_se_expand (Conv2D)	(None, 1, 1, 1536)	99840

```

['block6c_se_reduce[0][0]']

block6c_se_excite (Multiply) (None, 7, 7, 1536) 0
['block6c_activation[0][0]',
'block6c_se_expand[0][0]']

block6c_project_conv (Conv2D) (None, 7, 7, 256) 393216
['block6c_se_excite[0][0]']

block6c_project_bn (BatchNormal (None, 7, 7, 256) 1024
['block6c_project_conv[0][0]'
lization)

block6c_drop (Dropout) (None, 7, 7, 256) 0
['block6c_project_bn[0][0]']

block6c_add (Add) (None, 7, 7, 256) 0
['block6c_drop[0][0]',
'block6b_add[0][0]']

block6d_expand_conv (Conv2D) (None, 7, 7, 1536) 393216
['block6c_add[0][0]']

block6d_expand_bn (BatchNormal (None, 7, 7, 1536) 6144
['block6d_expand_conv[0][0]'
ization)

block6d_expand_activation (Act (None, 7, 7, 1536) 0
['block6d_expand_bn[0][0]'
ivation)

block6d_dwconv2 (DepthwiseConv (None, 7, 7, 1536) 13824
['block6d_expand_activation[0][0]
2D)

block6d_bn (BatchNormalization (None, 7, 7, 1536) 6144
['block6d_dwconv2[0][0]']
)

block6d_activation (Activation (None, 7, 7, 1536) 0
['block6d_bn[0][0]']
)

block6d_se_squeeze (GlobalAver (None, 1536) 0
['block6d_activation[0][0]']
agePooling2D)

block6d_se_reshape (Reshape) (None, 1, 1, 1536) 0

```

```

['block6d_se_squeeze[0][0]']

block6d_se_reduce (Conv2D)      (None, 1, 1, 64)      98368
['block6d_se_reshape[0][0]']

block6d_se_expand (Conv2D)      (None, 1, 1, 1536)    99840
['block6d_se_reduce[0][0]']

block6d_se_excite (Multiply)    (None, 7, 7, 1536)    0
['block6d_activation[0][0]',
'block6d_se_expand[0][0]']

block6d_project_conv (Conv2D)   (None, 7, 7, 256)     393216
['block6d_se_excite[0][0]']

block6d_project_bn (BatchNormal (None, 7, 7, 256)     1024
ization)
['block6d_project_conv[0][0]']

block6d_drop (Dropout)          (None, 7, 7, 256)     0
['block6d_project_bn[0][0]']

block6d_add (Add)               (None, 7, 7, 256)     0
['block6d_drop[0][0]',
'block6c_add[0][0]']

block6e_expand_conv (Conv2D)    (None, 7, 7, 1536)    393216
['block6d_add[0][0]']

block6e_expand_bn (BatchNormal (None, 7, 7, 1536)    6144
ization)
['block6e_expand_conv[0][0]']

block6e_expand_activation (Act (None, 7, 7, 1536)    0
ivation)
['block6e_expand_bn[0][0]']

block6e_dwconv2 (DepthwiseConv (None, 7, 7, 1536)    13824
ization)
['block6e_expand_activation[0][0]']

block6e_bn (BatchNormalization (None, 7, 7, 1536)    6144
ization)
['block6e_dwconv2[0][0]']

block6e_activation (Activation (None, 7, 7, 1536)    0
ization)
['block6e_bn[0][0]']

```

block6e_se_squeeze (GlobalAveragePooling2D)	(None, 1536)	0
['block6e_activation[0][0]']		
block6e_se_reshape (Reshape)	(None, 1, 1, 1536)	0
['block6e_se_squeeze[0][0]']		
block6e_se_reduce (Conv2D)	(None, 1, 1, 64)	98368
['block6e_se_reshape[0][0]']		
block6e_se_expand (Conv2D)	(None, 1, 1, 1536)	99840
['block6e_se_reduce[0][0]']		
block6e_se_excite (Multiply)	(None, 7, 7, 1536)	0
['block6e_activation[0][0]', 'block6e_se_expand[0][0]']		
block6e_project_conv (Conv2D)	(None, 7, 7, 256)	393216
['block6e_se_excite[0][0]']		
block6e_project_bn (BatchNormalization)	(None, 7, 7, 256)	1024
['block6e_project_conv[0][0]']		
block6e_drop (Dropout)	(None, 7, 7, 256)	0
['block6e_project_bn[0][0]']		
block6e_add (Add)	(None, 7, 7, 256)	0
['block6e_drop[0][0]', 'block6d_add[0][0]']		
block6f_expand_conv (Conv2D)	(None, 7, 7, 1536)	393216
['block6e_add[0][0]']		
block6f_expand_bn (BatchNormalization)	(None, 7, 7, 1536)	6144
['block6f_expand_conv[0][0]']		
block6f_expand_activation (Activation)	(None, 7, 7, 1536)	0
['block6f_expand_bn[0][0]']		
block6f_dwconv2 (DepthwiseConv2D)	(None, 7, 7, 1536)	13824
['block6f_expand_activation[0][0]']		
block6f_bn (BatchNormalization)	(None, 7, 7, 1536)	6144

```

['block6f_dwconv2[0][0]']
)

block6f_activation (Activation (None, 7, 7, 1536) 0
['block6f_bn[0][0]']
)

block6f_se_squeeze (GlobalAver (None, 1536) 0
['block6f_activation[0][0]']
agePooling2D)

block6f_se_reshape (Reshape) (None, 1, 1, 1536) 0
['block6f_se_squeeze[0][0]']

block6f_se_reduce (Conv2D) (None, 1, 1, 64) 98368
['block6f_se_reshape[0][0]']

block6f_se_expand (Conv2D) (None, 1, 1, 1536) 99840
['block6f_se_reduce[0][0]']

block6f_se_excite (Multiply) (None, 7, 7, 1536) 0
['block6f_activation[0][0]',
'block6f_se_expand[0][0]']

block6f_project_conv (Conv2D) (None, 7, 7, 256) 393216
['block6f_se_excite[0][0]']

block6f_project_bn (BatchNorma (None, 7, 7, 256) 1024
['block6f_project_conv[0][0]']
lization)

block6f_drop (Dropout) (None, 7, 7, 256) 0
['block6f_project_bn[0][0]']

block6f_add (Add) (None, 7, 7, 256) 0
['block6f_drop[0][0]',
'block6e_add[0][0]']

block6g_expand_conv (Conv2D) (None, 7, 7, 1536) 393216
['block6f_add[0][0]']

block6g_expand_bn (BatchNormal (None, 7, 7, 1536) 6144
['block6g_expand_conv[0][0]']
ization)

block6g_expand_activation (Act (None, 7, 7, 1536) 0
['block6g_expand_bn[0][0]']
ivation)

```



```

block6g_dwconv2 (DepthwiseConv (None, 7, 7, 1536) 13824
['block6g_expand_activation[0][0]
2D)

block6g_bn (BatchNormalization (None, 7, 7, 1536) 6144
['block6g_dwconv2[0][0]']
)

block6g_activation (Activation (None, 7, 7, 1536) 0
['block6g_bn[0][0]']
)

block6g_se_squeeze (GlobalAver (None, 1536) 0
['block6g_activation[0][0]']
agePooling2D)

block6g_se_reshape (Reshape) (None, 1, 1, 1536) 0
['block6g_se_squeeze[0][0]']

block6g_se_reduce (Conv2D) (None, 1, 1, 64) 98368
['block6g_se_reshape[0][0]']

block6g_se_expand (Conv2D) (None, 1, 1, 1536) 99840
['block6g_se_reduce[0][0]']

block6g_se_excite (Multiply) (None, 7, 7, 1536) 0
['block6g_activation[0][0]',
'block6g_se_expand[0][0]']

block6g_project_conv (Conv2D) (None, 7, 7, 256) 393216
['block6g_se_excite[0][0]']

block6g_project_bn (BatchNorma (None, 7, 7, 256) 1024
['block6g_project_conv[0][0]']
lization)

block6g_drop (Dropout) (None, 7, 7, 256) 0
['block6g_project_bn[0][0]']

block6g_add (Add) (None, 7, 7, 256) 0
['block6g_drop[0][0]',
'block6f_add[0][0]']

block6h_expand_conv (Conv2D) (None, 7, 7, 1536) 393216
['block6g_add[0][0]']

block6h_expand_bn (BatchNormal (None, 7, 7, 1536) 6144

```

```

['block6h_expand_conv[0][0]']
ization)

block6h_expand_activation (Act (None, 7, 7, 1536) 0
['block6h_expand_bn[0][0]']
ivation)

block6h_dwconv2 (DepthwiseConv (None, 7, 7, 1536) 13824
['block6h_expand_activation[0][0]
2D)

block6h_bn (BatchNormalization (None, 7, 7, 1536) 6144
['block6h_dwconv2[0][0]']
)

block6h_activation (Activation (None, 7, 7, 1536) 0
['block6h_bn[0][0]']
)

block6h_se_squeeze (GlobalAver (None, 1536) 0
['block6h_activation[0][0]']
agePooling2D)

block6h_se_reshape (Reshape) (None, 1, 1, 1536) 0
['block6h_se_squeeze[0][0]']

block6h_se_reduce (Conv2D) (None, 1, 1, 64) 98368
['block6h_se_reshape[0][0]']

block6h_se_expand (Conv2D) (None, 1, 1, 1536) 99840
['block6h_se_reduce[0][0]']

block6h_se_excite (Multiply) (None, 7, 7, 1536) 0
['block6h_activation[0][0]',
'block6h_se_expand[0][0]']

block6h_project_conv (Conv2D) (None, 7, 7, 256) 393216
['block6h_se_excite[0][0]']

block6h_project_bn (BatchNorma (None, 7, 7, 256) 1024
['block6h_project_conv[0][0]']
lization)

block6h_drop (Dropout) (None, 7, 7, 256) 0
['block6h_project_bn[0][0]']

block6h_add (Add) (None, 7, 7, 256) 0
['block6h_drop[0][0]',

```

```

'block6g_add[0][0]']

block6i_expand_conv (Conv2D)      (None, 7, 7, 1536)    393216
['block6h_add[0][0]']

block6i_expand_bn (BatchNormal    (None, 7, 7, 1536)    6144
['block6i_expand_conv[0][0]']
ization)

block6i_expand_activation (Act    (None, 7, 7, 1536)    0
['block6i_expand_bn[0][0]']
ivation)

block6i_dwconv2 (DepthwiseConv    (None, 7, 7, 1536)    13824
['block6i_expand_activation[0][0]
2D)

block6i_bn (BatchNormalization    (None, 7, 7, 1536)    6144
['block6i_dwconv2[0][0]']
)

block6i_activation (Activation    (None, 7, 7, 1536)    0
['block6i_bn[0][0]']
)

block6i_se_squeeze (GlobalAver    (None, 1536)          0
['block6i_activation[0][0]']
agePooling2D)

block6i_se_reshape (Reshape)      (None, 1, 1, 1536)    0
['block6i_se_squeeze[0][0]']

block6i_se_reduce (Conv2D)        (None, 1, 1, 64)      98368
['block6i_se_reshape[0][0]']

block6i_se_expand (Conv2D)        (None, 1, 1, 1536)    99840
['block6i_se_reduce[0][0]']

block6i_se_excite (Multiply)      (None, 7, 7, 1536)    0
['block6i_activation[0][0]',
'block6i_se_expand[0][0]']

block6i_project_conv (Conv2D)     (None, 7, 7, 256)     393216
['block6i_se_excite[0][0]']

block6i_project_bn (BatchNorma    (None, 7, 7, 256)     1024
['block6i_project_conv[0][0]']
lization)

```

block6i_drop (Dropout)	(None, 7, 7, 256)	0
['block6i_project_bn[0][0]']		
block6i_add (Add)	(None, 7, 7, 256)	0
['block6i_drop[0][0]',		
'block6h_add[0][0]']		
block6j_expand_conv (Conv2D)	(None, 7, 7, 1536)	393216
['block6i_add[0][0]']		
block6j_expand_bn (BatchNormal	(None, 7, 7, 1536)	6144
['block6j_expand_conv[0][0]']		
ization)		
block6j_expand_activation (Act	(None, 7, 7, 1536)	0
['block6j_expand_bn[0][0]']		
ivation)		
block6j_dwconv2 (DepthwiseConv	(None, 7, 7, 1536)	13824
['block6j_expand_activation[0][0]		
2D)		
block6j_bn (BatchNormalization	(None, 7, 7, 1536)	6144
['block6j_dwconv2[0][0]']		
)		
block6j_activation (Activation	(None, 7, 7, 1536)	0
['block6j_bn[0][0]']		
)		
block6j_se_squeeze (GlobalAver	(None, 1536)	0
['block6j_activation[0][0]']		
agePooling2D)		
block6j_se_reshape (Reshape)	(None, 1, 1, 1536)	0
['block6j_se_squeeze[0][0]']		
block6j_se_reduce (Conv2D)	(None, 1, 1, 64)	98368
['block6j_se_reshape[0][0]']		
block6j_se_expand (Conv2D)	(None, 1, 1, 1536)	99840
['block6j_se_reduce[0][0]']		
block6j_se_excite (Multiply)	(None, 7, 7, 1536)	0
['block6j_activation[0][0]',		
'block6j_se_expand[0][0]']		

block6j_project_conv (Conv2D)	(None, 7, 7, 256)	393216	
['block6j_se_excite[0][0]']			
block6j_project_bn (BatchNormal	(None, 7, 7, 256)	1024	
['block6j_project_conv[0][0]']			
ization)			
block6j_drop (Dropout)	(None, 7, 7, 256)	0	
['block6j_project_bn[0][0]']			
block6j_add (Add)	(None, 7, 7, 256)	0	
['block6j_drop[0][0]',			
'block6i_add[0][0]']			
block6k_expand_conv (Conv2D)	(None, 7, 7, 1536)	393216	
['block6j_add[0][0]']			
block6k_expand_bn (BatchNormal	(None, 7, 7, 1536)	6144	
['block6k_expand_conv[0][0]']			
ization)			
block6k_expand_activation (Act	(None, 7, 7, 1536)	0	
['block6k_expand_bn[0][0]']			
ivation)			
block6k_dwconv2 (DepthwiseConv	(None, 7, 7, 1536)	13824	
['block6k_expand_activation[0][0]			
2D)			
block6k_bn (BatchNormalization	(None, 7, 7, 1536)	6144	
['block6k_dwconv2[0][0]']			
)			
block6k_activation (Activation	(None, 7, 7, 1536)	0	
['block6k_bn[0][0]']			
)			
block6k_se_squeeze (GlobalAver	(None, 1536)	0	
['block6k_activation[0][0]']			
agePooling2D)			
block6k_se_reshape (Reshape)	(None, 1, 1, 1536)	0	
['block6k_se_squeeze[0][0]']			
block6k_se_reduce (Conv2D)	(None, 1, 1, 64)	98368	
['block6k_se_reshape[0][0]']			
block6k_se_expand (Conv2D)	(None, 1, 1, 1536)	99840	

```

['block6k_se_reduce[0][0]']

block6k_se_excite (Multiply) (None, 7, 7, 1536) 0
['block6k_activation[0][0]',
'block6k_se_expand[0][0]']

block6k_project_conv (Conv2D) (None, 7, 7, 256) 393216
['block6k_se_excite[0][0]']

block6k_project_bn (BatchNormal (None, 7, 7, 256) 1024
['block6k_project_conv[0][0]'
lization)

block6k_drop (Dropout) (None, 7, 7, 256) 0
['block6k_project_bn[0][0]']

block6k_add (Add) (None, 7, 7, 256) 0
['block6k_drop[0][0]',
'block6j_add[0][0]']

block6l_expand_conv (Conv2D) (None, 7, 7, 1536) 393216
['block6k_add[0][0]']

block6l_expand_bn (BatchNormal (None, 7, 7, 1536) 6144
['block6l_expand_conv[0][0]'
ization)

block6l_expand_activation (Act (None, 7, 7, 1536) 0
['block6l_expand_bn[0][0]'
ivation)

block6l_dwconv2 (DepthwiseConv (None, 7, 7, 1536) 13824
['block6l_expand_activation[0][0]
2D)

block6l_bn (BatchNormalization (None, 7, 7, 1536) 6144
['block6l_dwconv2[0][0]']
)

block6l_activation (Activation (None, 7, 7, 1536) 0
['block6l_bn[0][0]']
)

block6l_se_squeeze (GlobalAver (None, 1536) 0
['block6l_activation[0][0]']
agePooling2D)

block6l_se_reshape (Reshape) (None, 1, 1, 1536) 0

```

```

['block6l_se_squeeze[0][0]']

    block6l_se_reduce (Conv2D)      (None, 1, 1, 64)      98368
['block6l_se_reshape[0][0]']

    block6l_se_expand (Conv2D)      (None, 1, 1, 1536)    99840
['block6l_se_reduce[0][0]']

    block6l_se_excite (Multiply)    (None, 7, 7, 1536)    0
['block6l_activation[0][0]',
'block6l_se_expand[0][0]']

    block6l_project_conv (Conv2D)   (None, 7, 7, 256)     393216
['block6l_se_excite[0][0]']

    block6l_project_bn (BatchNormal (None, 7, 7, 256)     1024
['block6l_project_conv[0][0]']
    ization)

    block6l_drop (Dropout)          (None, 7, 7, 256)     0
['block6l_project_bn[0][0]']

    block6l_add (Add)               (None, 7, 7, 256)     0
['block6l_drop[0][0]',
'block6k_add[0][0]']

    block6m_expand_conv (Conv2D)    (None, 7, 7, 1536)    393216
['block6l_add[0][0]']

    block6m_expand_bn (BatchNormal (None, 7, 7, 1536)    6144
['block6m_expand_conv[0][0]']
    ization)

    block6m_expand_activation (Act (None, 7, 7, 1536)    0
['block6m_expand_bn[0][0]']
    ivation)

    block6m_dwconv2 (DepthwiseConv (None, 7, 7, 1536)    13824
['block6m_expand_activation[0][0]
    2D)

    block6m_bn (BatchNormalization (None, 7, 7, 1536)    6144
['block6m_dwconv2[0][0]']
    )

    block6m_activation (Activation (None, 7, 7, 1536)    0
['block6m_bn[0][0]']
    )

```

block6m_se_squeeze (GlobalAveragePooling2D)	(None, 1536)	0
['block6m_activation[0][0]']		
block6m_se_reshape (Reshape)	(None, 1, 1, 1536)	0
['block6m_se_squeeze[0][0]']		
block6m_se_reduce (Conv2D)	(None, 1, 1, 64)	98368
['block6m_se_reshape[0][0]']		
block6m_se_expand (Conv2D)	(None, 1, 1, 1536)	99840
['block6m_se_reduce[0][0]']		
block6m_se_excite (Multiply)	(None, 7, 7, 1536)	0
['block6m_activation[0][0]', 'block6m_se_expand[0][0]']		
block6m_project_conv (Conv2D)	(None, 7, 7, 256)	393216
['block6m_se_excite[0][0]']		
block6m_project_bn (BatchNormalization)	(None, 7, 7, 256)	1024
['block6m_project_conv[0][0]']		
block6m_drop (Dropout)	(None, 7, 7, 256)	0
['block6m_project_bn[0][0]']		
block6m_add (Add)	(None, 7, 7, 256)	0
['block6m_drop[0][0]', 'block6l_add[0][0]']		
block6n_expand_conv (Conv2D)	(None, 7, 7, 1536)	393216
['block6m_add[0][0]']		
block6n_expand_bn (BatchNormalization)	(None, 7, 7, 1536)	6144
['block6n_expand_conv[0][0]']		
block6n_expand_activation (Activation)	(None, 7, 7, 1536)	0
['block6n_expand_bn[0][0]']		
block6n_dwconv2 (DepthwiseConv2D)	(None, 7, 7, 1536)	13824
['block6n_expand_activation[0][0]']		
block6n_bn (BatchNormalization)	(None, 7, 7, 1536)	6144


```

['block6n_dwconv2[0][0]']
)

block6n_activation (Activation (None, 7, 7, 1536) 0
['block6n_bn[0][0]']
)

block6n_se_squeeze (GlobalAver (None, 1536) 0
['block6n_activation[0][0]']
agePooling2D)

block6n_se_reshape (Reshape) (None, 1, 1, 1536) 0
['block6n_se_squeeze[0][0]']

block6n_se_reduce (Conv2D) (None, 1, 1, 64) 98368
['block6n_se_reshape[0][0]']

block6n_se_expand (Conv2D) (None, 1, 1, 1536) 99840
['block6n_se_reduce[0][0]']

block6n_se_excite (Multiply) (None, 7, 7, 1536) 0
['block6n_activation[0][0]',
'block6n_se_expand[0][0]']

block6n_project_conv (Conv2D) (None, 7, 7, 256) 393216
['block6n_se_excite[0][0]']

block6n_project_bn (BatchNorma (None, 7, 7, 256) 1024
['block6n_project_conv[0][0]']
lization)

block6n_drop (Dropout) (None, 7, 7, 256) 0
['block6n_project_bn[0][0]']

block6n_add (Add) (None, 7, 7, 256) 0
['block6n_drop[0][0]',
'block6m_add[0][0]']

block6o_expand_conv (Conv2D) (None, 7, 7, 1536) 393216
['block6n_add[0][0]']

block6o_expand_bn (BatchNormal (None, 7, 7, 1536) 6144
['block6o_expand_conv[0][0]']
ization)

block6o_expand_activation (Act (None, 7, 7, 1536) 0
['block6o_expand_bn[0][0]']
ivation)

```

```

block6o_dwconv2 (DepthwiseConv (None, 7, 7, 1536) 13824
['block6o_expand_activation[0][0]
2D)

block6o_bn (BatchNormalization (None, 7, 7, 1536) 6144
['block6o_dwconv2[0][0]']
)

block6o_activation (Activation (None, 7, 7, 1536) 0
['block6o_bn[0][0]']
)

block6o_se_squeeze (GlobalAver (None, 1536) 0
['block6o_activation[0][0]']
agePooling2D)

block6o_se_reshape (Reshape) (None, 1, 1, 1536) 0
['block6o_se_squeeze[0][0]']

block6o_se_reduce (Conv2D) (None, 1, 1, 64) 98368
['block6o_se_reshape[0][0]']

block6o_se_expand (Conv2D) (None, 1, 1, 1536) 99840
['block6o_se_reduce[0][0]']

block6o_se_excite (Multiply) (None, 7, 7, 1536) 0
['block6o_activation[0][0]',
'block6o_se_expand[0][0]']

block6o_project_conv (Conv2D) (None, 7, 7, 256) 393216
['block6o_se_excite[0][0]']

block6o_project_bn (BatchNorma (None, 7, 7, 256) 1024
['block6o_project_conv[0][0]']
lization)

block6o_drop (Dropout) (None, 7, 7, 256) 0
['block6o_project_bn[0][0]']

block6o_add (Add) (None, 7, 7, 256) 0
['block6o_drop[0][0]',
'block6n_add[0][0]']

top_conv (Conv2D) (None, 7, 7, 1280) 327680
['block6o_add[0][0]']

top_bn (BatchNormalization) (None, 7, 7, 1280) 5120

```

```
['top_conv[0][0]']
```

```
top_activation (Activation)      (None, 7, 7, 1280)    0  
['top_bn[0][0]']
```

```
=====
```

```
Total params: 20,331,360  
Trainable params: 20,177,488  
Non-trainable params: 153,872
```

```
-----
```

```
[8]: x = base_model.output  
x = GlobalAveragePooling2D()(x)  
output = Dense(num_classes, activation='softmax')(x)  
model = Model(inputs=base_model.input, outputs=output)  
  
model.compile(optimizer='adam',  
              loss='sparse_categorical_crossentropy',  
              metrics=['accuracy'])  
  
tensorboard_callback = tf.keras.callbacks.TensorBoard(log_dir='logs')  
  
hist = model.fit(train_data, epochs=20, validation_data=val_data,  
                ↪callbacks=[tensorboard_callback])
```

```
Epoch 1/20  
168/168 [=====] - 37s 150ms/step - loss: 0.5391 -  
accuracy: 0.8088 - val_loss: 0.1536 - val_accuracy: 0.9463  
Epoch 2/20  
168/168 [=====] - 24s 144ms/step - loss: 0.2013 -  
accuracy: 0.9361 - val_loss: 0.2997 - val_accuracy: 0.9062  
Epoch 3/20  
168/168 [=====] - 24s 140ms/step - loss: 0.1385 -  
accuracy: 0.9563 - val_loss: 0.2475 - val_accuracy: 0.9162  
Epoch 4/20  
168/168 [=====] - 24s 140ms/step - loss: 0.1240 -  
accuracy: 0.9581 - val_loss: 0.1566 - val_accuracy: 0.9499  
Epoch 5/20  
168/168 [=====] - 24s 143ms/step - loss: 0.0686 -  
accuracy: 0.9800 - val_loss: 0.1425 - val_accuracy: 0.9642  
Epoch 6/20  
168/168 [=====] - 24s 144ms/step - loss: 0.0981 -  
accuracy: 0.9673 - val_loss: 0.1719 - val_accuracy: 0.9420  
Epoch 7/20  
168/168 [=====] - 24s 143ms/step - loss: 0.0798 -  
accuracy: 0.9744 - val_loss: 0.1409 - val_accuracy: 0.9592
```

```

Epoch 8/20
168/168 [=====] - 24s 145ms/step - loss: 0.0606 -
accuracy: 0.9837 - val_loss: 0.1620 - val_accuracy: 0.9549
Epoch 9/20
168/168 [=====] - 25s 148ms/step - loss: 0.0473 -
accuracy: 0.9839 - val_loss: 0.1989 - val_accuracy: 0.9535
Epoch 10/20
168/168 [=====] - 25s 147ms/step - loss: 0.0401 -
accuracy: 0.9860 - val_loss: 0.1402 - val_accuracy: 0.9656
Epoch 11/20
168/168 [=====] - 25s 147ms/step - loss: 0.0368 -
accuracy: 0.9865 - val_loss: 0.1535 - val_accuracy: 0.9520
Epoch 12/20
168/168 [=====] - 25s 147ms/step - loss: 0.0558 -
accuracy: 0.9811 - val_loss: 0.1871 - val_accuracy: 0.9485
Epoch 13/20
168/168 [=====] - 25s 147ms/step - loss: 0.0364 -
accuracy: 0.9884 - val_loss: 0.1588 - val_accuracy: 0.9578
Epoch 14/20
168/168 [=====] - 24s 145ms/step - loss: 0.0544 -
accuracy: 0.9839 - val_loss: 0.1678 - val_accuracy: 0.9585
Epoch 15/20
168/168 [=====] - 24s 143ms/step - loss: 0.0242 -
accuracy: 0.9914 - val_loss: 0.1301 - val_accuracy: 0.9664
Epoch 16/20
168/168 [=====] - 24s 142ms/step - loss: 0.0262 -
accuracy: 0.9916 - val_loss: 0.1819 - val_accuracy: 0.9528
Epoch 17/20
168/168 [=====] - 24s 142ms/step - loss: 0.0296 -
accuracy: 0.9903 - val_loss: 0.1385 - val_accuracy: 0.9664
Epoch 18/20
168/168 [=====] - 24s 141ms/step - loss: 0.0316 -
accuracy: 0.9899 - val_loss: 0.1685 - val_accuracy: 0.9542
Epoch 19/20
168/168 [=====] - 24s 141ms/step - loss: 0.0478 -
accuracy: 0.9865 - val_loss: 0.1919 - val_accuracy: 0.9463
Epoch 20/20
168/168 [=====] - 24s 141ms/step - loss: 0.0328 -
accuracy: 0.9907 - val_loss: 0.1738 - val_accuracy: 0.9542

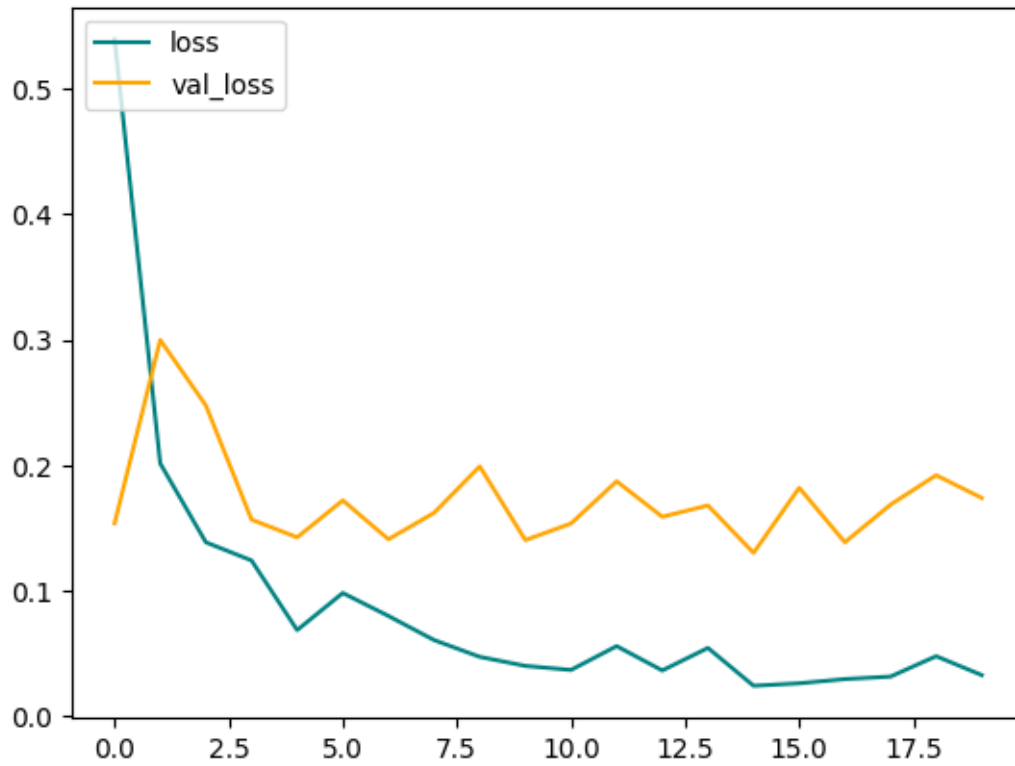
```

```

[9]: fig = plt.figure()
plt.plot(hist.history['loss'], color='teal', label='loss')
plt.plot(hist.history['val_loss'], color='orange', label='val_loss')
fig.suptitle('Loss', fontsize=20)
plt.legend(loc="upper left")
plt.show()

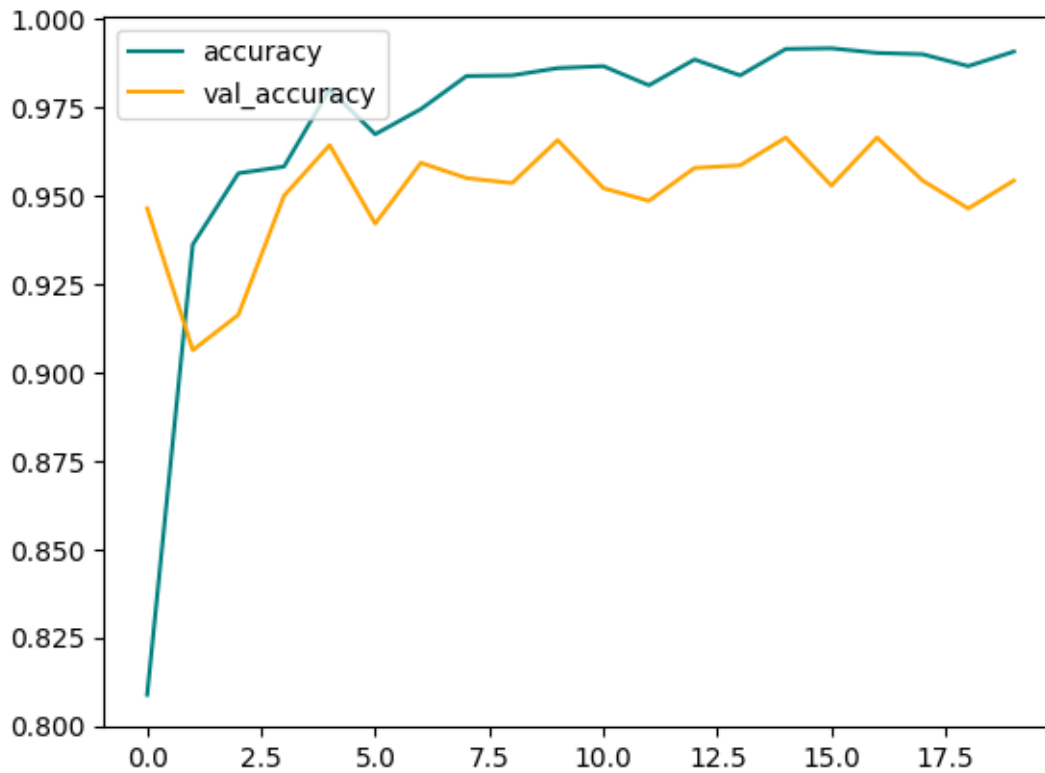
```

Loss



```
[10]: fig = plt.figure()
plt.plot(hist.history['accuracy'], color='teal', label='accuracy')
plt.plot(hist.history['val_accuracy'], color='orange', label='val_accuracy')
fig.suptitle('Accuracy', fontsize=20)
plt.legend(loc="upper left")
plt.show()
```

Accuracy



```
[11]: pre = Precision()
      re = Recall()
      acc = SparseCategoricalAccuracy()
```

```
[12]: for batch in test_data.as_numpy_iterator():
      X, y = batch
      yhat = model.predict(X)

      yhat_classes = tf.argmax(yhat, axis=1)

      pre.update_state(y, yhat_classes)
      re.update_state(y, yhat_classes)
      acc.update_state(y, yhat)
```

```
1/1 [=====] - 1s 1s/step
1/1 [=====] - 0s 26ms/step
1/1 [=====] - 0s 24ms/step
1/1 [=====] - 0s 24ms/step
1/1 [=====] - 0s 24ms/step
1/1 [=====] - 0s 30ms/step
```

```

1/1 [=====] - 0s 78ms/step
1/1 [=====] - 0s 28ms/step
1/1 [=====] - 0s 27ms/step
1/1 [=====] - 0s 30ms/step
1/1 [=====] - 0s 26ms/step
1/1 [=====] - 0s 24ms/step
1/1 [=====] - 0s 24ms/step
1/1 [=====] - 0s 24ms/step
1/1 [=====] - 0s 25ms/step
1/1 [=====] - 0s 25ms/step
1/1 [=====] - 0s 25ms/step
1/1 [=====] - 0s 25ms/step
1/1 [=====] - 0s 23ms/step
1/1 [=====] - 0s 26ms/step
1/1 [=====] - 0s 26ms/step
1/1 [=====] - 0s 26ms/step
1/1 [=====] - 0s 27ms/step
1/1 [=====] - 0s 25ms/step
1/1 [=====] - 1s 1s/step

```

```

[13]: print(f"Precision: {pre.result().numpy() * 100 : .2f}%")
      print(f"Recall: {re.result().numpy() * 100 : .2f}%")
      print(f"Accuracy: {acc.result().numpy() * 100 : .2f}%")

```

```

Precision: 98.89%
Recall: 99.68%
Accuracy: 95.14%

```

```

[14]: img = cv2.imread('Styles/test/Hatchback/8_jpg.rf.
      ↪c314c1d6777942876503fa1482c82240.jpg')

img_resized = cv2.resize(img, img_size)
img_expanded = np.expand_dims(img_resized, axis=0)

yhat = model.predict(img_expanded)
predicted_class = tf.argmax(yhat, axis=1).numpy()[0]

plt.imshow(img)
plt.title(f'Predicted class: {predicted_class}')
plt.axis('off')
plt.show()

```

```

1/1 [=====] - 1s 1s/step

```

Predicted class: 2



```
[15]: print(f'Predicted class is: {class_names[predicted_class]}')
      for idx, prob in enumerate(yhat[0]):
          print(f"Model probability for {class_names[idx]} is {prob * 100:.2f}%")
```

```
Predicted class is: Hatchback
Model probability for Convertible is 0.00%
Model probability for Coupe is 0.00%
Model probability for Hatchback is 99.90%
Model probability for Pick-Up is 0.00%
Model probability for SUV is 0.09%
Model probability for Sedan is 0.00%
Model probability for VAN is 0.00%
```

```
[16]: model_file_name = f"CarStyle{acc.result().numpy() * 100 : .2f}% EfficientNetV2S.
      ↪h5"
      model.save(os.path.join('CarBackEnd/models/CarStyles', model_file_name))
```

```
[ ]:
```