

# MODEL BUILDING

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Model building

[ ] from tensorflow.keras.layers import Dense, Flatten, Input
    from tensorflow.keras.models import Model
    from tensorflow.keras.preprocessing import image
    from tensorflow.keras.preprocessing.image import ImageDataGenerator, load_img
    from tensorflow.keras.applications.vgg16 import VGG16, preprocess_input
    from glob import glob
    import numpy as np
    import matplotlib.pyplot as plt

[ ] vgg = VGG16(input_shape=[244,244] + [3], weights='imagenet',include_top=False)

[ ] for layer in vgg.layers:
    layer.trainable = False

[ ] x= Flatten()(vgg.output)

[ ] prediction = Dense(3, activation = 'softmax')(x)

[ ] model = Model(inputs=vgg.input, outputs=prediction)

[ ] model.summary()

Model: "model_3"
Layer (type) Output Shape Param #
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input_5 (InputLayer) [(None, 244, 244, 3)] 0
block1_conv1 (Conv2D) (None, 244, 244, 64) 1792
block1_conv2 (Conv2D) (None, 244, 244, 64) 36928
block1_pool (MaxPooling2D) (None, 122, 122, 64) 0
block2_conv1 (Conv2D) (None, 122, 122, 128) 73856
block2_conv2 (Conv2D) (None, 122, 122, 128) 147584
block2_pool (MaxPooling2D) (None, 61, 61, 128) 0
block3_conv1 (Conv2D) (None, 61, 61, 256) 295168
block3_conv2 (Conv2D) (None, 61, 61, 256) 590080
block3_conv3 (Conv2D) (None, 61, 61, 256) 590080
block3_pool (MaxPooling2D) (None, 30, 30, 256) 0
block4_conv1 (Conv2D) (None, 30, 30, 512) 1180160
block4_conv2 (Conv2D) (None, 30, 30, 512) 2359808
block4_conv3 (Conv2D) (None, 30, 30, 512) 2359808
block4_pool (MaxPooling2D) (None, 15, 15, 512) 0
block5_conv1 (Conv2D) (None, 15, 15, 512) 2359808
block5_conv2 (Conv2D) (None, 15, 15, 512) 2359808

[ ] model.compile(loss='categorical_crossentropy', optimizer='adam', metrics=['acc'])

import sys
r = model.fit_generator(training_set, validation_data=test_set, epochs=25, steps_per_epoch=979/18, validation_steps=171/18)

/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:12: UserWarning: "Model.fit_generator" is deprecated and will be removed in a future version. Please use "Model.fit", which supports generators.

Epoch 1/25
97/97 [=====] - 708s 7s/step - loss: 1.1951 - acc: 0.5428 - val_loss: 1.6560 - val_acc: 0.4529
Epoch 2/25
97/97 [=====] - 698s 7s/step - loss: 0.8388 - acc: 0.6842 - val_loss: 0.9590 - val_acc: 0.6796
Epoch 3/25
97/97 [=====] - 705s 7s/step - loss: 0.5889 - acc: 0.7595 - val_loss: 1.0240 - val_acc: 0.6000
Epoch 4/25
97/97 [=====] - 701s 7s/step - loss: 0.4671 - acc: 0.8204 - val_loss: 1.4102 - val_acc: 0.5647
Epoch 5/25
97/97 [=====] - 697s 7s/step - loss: 0.4676 - acc: 0.8338 - val_loss: 0.9928 - val_acc: 0.6588
Epoch 6/25
97/97 [=====] - 699s 7s/step - loss: 0.2976 - acc: 0.8824 - val_loss: 1.0740 - val_acc: 0.6000
Epoch 7/25
97/97 [=====] - 703s 7s/step - loss: 0.2596 - acc: 0.8927 - val_loss: 1.3152 - val_acc: 0.6000
Epoch 8/25
97/97 [=====] - 703s 7s/step - loss: 0.2316 - acc: 0.9185 - val_loss: 1.6390 - val_acc: 0.5118
Epoch 9/25
97/97 [=====] - 699s 7s/step - loss: 0.2036 - acc: 0.9257 - val_loss: 1.2134 - val_acc: 0.6859
Epoch 10/25
97/97 [=====] - 699s 7s/step - loss: 0.2178 - acc: 0.9164 - val_loss: 1.5050 - val_acc: 0.5647
Epoch 11/25
97/97 [=====] - 700s 7s/step - loss: 0.1604 - acc: 0.9432 - val_loss: 1.5312 - val_acc: 0.5520
Epoch 12/25
97/97 [=====] - 704s 7s/step - loss: 0.1442 - acc: 0.9556 - val_loss: 1.3178 - val_acc: 0.6800
Epoch 13/25
97/97 [=====] - 708s 7s/step - loss: 0.1345 - acc: 0.9484 - val_loss: 1.2094 - val_acc: 0.6118
Epoch 14/25
97/97 [=====] - 700s 7s/step - loss: 0.0993 - acc: 0.9670 - val_loss: 1.3947 - val_acc: 0.5824
Epoch 15/25
97/97 [=====] - 699s 7s/step - loss: 0.0969 - acc: 0.9670 - val_loss: 1.3170 - val_acc: 0.6353
Epoch 16/25
97/97 [=====] - 699s 7s/step - loss: 0.0902 - acc: 0.9701 - val_loss: 1.4834 - val_acc: 0.6059
Epoch 17/25
97/97 [=====] - 697s 7s/step - loss: 0.1466 - acc: 0.9453 - val_loss: 1.8313 - val_acc: 0.5588
Epoch 18/25
97/97 [=====] - 699s 7s/step - loss: 0.1137 - acc: 0.9628 - val_loss: 1.5040 - val_acc: 0.6412
Epoch 19/25
97/97 [=====] - 697s 7s/step - loss: 0.1387 - acc: 0.9546 - val_loss: 1.5051 - val_acc: 0.6176
Epoch 20/25
97/97 [=====] - 697s 7s/step - loss: 0.0833 - acc: 0.9752 - val_loss: 1.4206 - val_acc: 0.6353
Epoch 21/25
97/97 [=====] - 698s 7s/step - loss: 0.0747 - acc: 0.9711 - val_loss: 1.4836 - val_acc: 0.6294
Epoch 22/25
97/97 [=====] - 700s 7s/step - loss: 0.0912 - acc: 0.9711 - val_loss: 1.4576 - val_acc: 0.6588
Epoch 23/25
97/97 [=====] - 698s 7s/step - loss: 0.0832 - acc: 0.9711 - val_loss: 1.7270 - val_acc: 0.5882
Epoch 24/25
97/97 [=====] - 699s 7s/step - loss: 0.0511 - acc: 0.9845 - val_loss: 1.4532 - val_acc: 0.6824
Epoch 25/25
97/97 [=====] - 703s 7s/step - loss: 0.0752 - acc: 0.9742 - val_loss: 1.5182 - val_acc: 0.6235

[ ] model.save('body.h5')
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