#Understand the filters in the model

#Let us pick the first hidden layer as the layer of interest.

layer1 = model1.layers #Conv layers at 1, 3, 6, 8, 11, 13, 15

filters = model1.layers[3].get\_weights()

print(layer1[3].name)

layer2 = model2.layers #Conv layers at 1, 3, 6, 8, 11, 13, 15

filters = model2.layers[3].get\_weights()

print(layer2[1].name)

layer4 = model4.layers #Conv layers at 1, 3, 6, 8, 11, 13, 15

filters = model4.layers[3].get\_weights()

print(layer4[3].name)

# plot filters

fig1=plt.figure(figsize=(8, 12))

columns = 8

rows = 8

n\_filters = columns \* rows

for i in range(1, n\_filters +1):

f = filters[0][: ,: ,: ,[i-1]]

fig1 =plt.subplot(rows, columns, i)

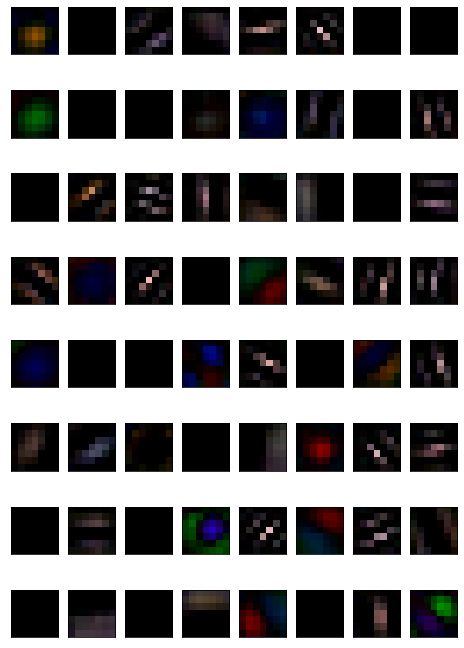
fig1.set\_xticks([]) #Turn off axis

fig1.set\_yticks([])

plt.imshow(f[:, :,:, 0], cmap='gray') #Show only the filters from 0th channel (R)

#ix += 1

plt.show()



conv\_layer\_index1 =[]

conv\_layer\_index2 =[]

conv\_layer\_index4 =[]

for i in range(199):

if layer1[i].name.find('conv') != -1:

conv\_layer\_index1.append(i)

for i in range(352):

if layer2[i].name.find('conv') != -1:

conv\_layer\_index2.append(i)

for i in range(418):

if layer4[i].name.find('conv') != -1:

conv\_layer\_index4.append(i)

#### Now plot filter outputs

#Define a new truncated model to only include the conv layers of interest

#conv\_layer\_index = [1, 3, 6, 8, 11, 13, 15]

#conv\_layer\_index = [1, 3, 6] #TO define a shorter model

outputs1 = [model1.layers[i].output for i in conv\_layer\_index1]

model\_short1 = Model(inputs=model1.inputs, outputs=outputs1)

outputs2 = [model2.layers[i].output for i in conv\_layer\_index2]

model\_short2 = Model(inputs=model2.inputs, outputs=outputs2)

outputs4 = [model4.layers[i].output for i in conv\_layer\_index4]

model\_short4 = Model(inputs=model4.inputs, outputs=outputs4)

print(model\_short1.summary())

Model: "model"

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Layer (type) Output Shape Param # Connected to

==================================================================================================

data (InputLayer) [(None, None, None, 0 []

3)]

bn\_data (BatchNormalization) (None, None, None, 9 ['data[0][0]']

3)

zero\_padding2d (ZeroPadding2D) (None, None, None, 0 ['bn\_data[0][0]']

3)

conv0 (Conv2D) (None, None, None, 9408 ['zero\_padding2d[0][0]']

64)

bn0 (BatchNormalization) (None, None, None, 256 ['conv0[0][0]']

64)

relu0 (Activation) (None, None, None, 0 ['bn0[0][0]']

64)

zero\_padding2d\_1 (ZeroPadding2 (None, None, None, 0 ['relu0[0][0]']

D) 64)

pooling0 (MaxPooling2D) (None, None, None, 0 ['zero\_padding2d\_1[0][0]']

64)

stage1\_unit1\_bn1 (BatchNormali (None, None, None, 256 ['pooling0[0][0]']

zation) 64)

stage1\_unit1\_relu1 (Activation (None, None, None, 0 ['stage1\_unit1\_bn1[0][0]']

) 64)

zero\_padding2d\_2 (ZeroPadding2 (None, None, None, 0 ['stage1\_unit1\_relu1[0][0]']

D) 64)

stage1\_unit1\_conv1 (Conv2D) (None, None, None, 36864 ['zero\_padding2d\_2[0][0]']

64)

stage1\_unit1\_bn2 (BatchNormali (None, None, None, 256 ['stage1\_unit1\_conv1[0][0]']

zation) 64)

stage1\_unit1\_relu2 (Activation (None, None, None, 0 ['stage1\_unit1\_bn2[0][0]']

) 64)

zero\_padding2d\_3 (ZeroPadding2 (None, None, None, 0 ['stage1\_unit1\_relu2[0][0]']

D) 64)

stage1\_unit1\_conv2 (Conv2D) (None, None, None, 36864 ['zero\_padding2d\_3[0][0]']

64)

stage1\_unit1\_sc (Conv2D) (None, None, None, 4096 ['stage1\_unit1\_relu1[0][0]']

64)

add (Add) (None, None, None, 0 ['stage1\_unit1\_conv2[0][0]',

64) 'stage1\_unit1\_sc[0][0]']

stage1\_unit2\_bn1 (BatchNormali (None, None, None, 256 ['add[0][0]']

zation) 64)

stage1\_unit2\_relu1 (Activation (None, None, None, 0 ['stage1\_unit2\_bn1[0][0]']

) 64)

zero\_padding2d\_4 (ZeroPadding2 (None, None, None, 0 ['stage1\_unit2\_relu1[0][0]']

D) 64)

stage1\_unit2\_conv1 (Conv2D) (None, None, None, 36864 ['zero\_padding2d\_4[0][0]']

64)

stage1\_unit2\_bn2 (BatchNormali (None, None, None, 256 ['stage1\_unit2\_conv1[0][0]']

zation) 64)

stage1\_unit2\_relu2 (Activation (None, None, None, 0 ['stage1\_unit2\_bn2[0][0]']

) 64)

zero\_padding2d\_5 (ZeroPadding2 (None, None, None, 0 ['stage1\_unit2\_relu2[0][0]']

D) 64)

stage1\_unit2\_conv2 (Conv2D) (None, None, None, 36864 ['zero\_padding2d\_5[0][0]']

64)

add\_1 (Add) (None, None, None, 0 ['stage1\_unit2\_conv2[0][0]',

64) 'add[0][0]']

stage1\_unit3\_bn1 (BatchNormali (None, None, None, 256 ['add\_1[0][0]']

zation) 64)

stage1\_unit3\_relu1 (Activation (None, None, None, 0 ['stage1\_unit3\_bn1[0][0]']

) 64)

zero\_padding2d\_6 (ZeroPadding2 (None, None, None, 0 ['stage1\_unit3\_relu1[0][0]']

D) 64)

stage1\_unit3\_conv1 (Conv2D) (None, None, None, 36864 ['zero\_padding2d\_6[0][0]']

64)

stage1\_unit3\_bn2 (BatchNormali (None, None, None, 256 ['stage1\_unit3\_conv1[0][0]']

zation) 64)

stage1\_unit3\_relu2 (Activation (None, None, None, 0 ['stage1\_unit3\_bn2[0][0]']

) 64)

zero\_padding2d\_7 (ZeroPadding2 (None, None, None, 0 ['stage1\_unit3\_relu2[0][0]']

D) 64)

stage1\_unit3\_conv2 (Conv2D) (None, None, None, 36864 ['zero\_padding2d\_7[0][0]']

64)

add\_2 (Add) (None, None, None, 0 ['stage1\_unit3\_conv2[0][0]',

64) 'add\_1[0][0]']

stage2\_unit1\_bn1 (BatchNormali (None, None, None, 256 ['add\_2[0][0]']

zation) 64)

stage2\_unit1\_relu1 (Activation (None, None, None, 0 ['stage2\_unit1\_bn1[0][0]']

) 64)

zero\_padding2d\_8 (ZeroPadding2 (None, None, None, 0 ['stage2\_unit1\_relu1[0][0]']

D) 64)

stage2\_unit1\_conv1 (Conv2D) (None, None, None, 73728 ['zero\_padding2d\_8[0][0]']

128)

stage2\_unit1\_bn2 (BatchNormali (None, None, None, 512 ['stage2\_unit1\_conv1[0][0]']

zation) 128)

stage2\_unit1\_relu2 (Activation (None, None, None, 0 ['stage2\_unit1\_bn2[0][0]']

) 128)

zero\_padding2d\_9 (ZeroPadding2 (None, None, None, 0 ['stage2\_unit1\_relu2[0][0]']

D) 128)

stage2\_unit1\_conv2 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_9[0][0]']

128)

stage2\_unit1\_sc (Conv2D) (None, None, None, 8192 ['stage2\_unit1\_relu1[0][0]']

128)

add\_3 (Add) (None, None, None, 0 ['stage2\_unit1\_conv2[0][0]',

128) 'stage2\_unit1\_sc[0][0]']

stage2\_unit2\_bn1 (BatchNormali (None, None, None, 512 ['add\_3[0][0]']

zation) 128)

stage2\_unit2\_relu1 (Activation (None, None, None, 0 ['stage2\_unit2\_bn1[0][0]']

) 128)

zero\_padding2d\_10 (ZeroPadding (None, None, None, 0 ['stage2\_unit2\_relu1[0][0]']

2D) 128)

stage2\_unit2\_conv1 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_10[0][0]']

128)

stage2\_unit2\_bn2 (BatchNormali (None, None, None, 512 ['stage2\_unit2\_conv1[0][0]']

zation) 128)

stage2\_unit2\_relu2 (Activation (None, None, None, 0 ['stage2\_unit2\_bn2[0][0]']

) 128)

zero\_padding2d\_11 (ZeroPadding (None, None, None, 0 ['stage2\_unit2\_relu2[0][0]']

2D) 128)

stage2\_unit2\_conv2 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_11[0][0]']

128)

add\_4 (Add) (None, None, None, 0 ['stage2\_unit2\_conv2[0][0]',

128) 'add\_3[0][0]']

stage2\_unit3\_bn1 (BatchNormali (None, None, None, 512 ['add\_4[0][0]']

zation) 128)

stage2\_unit3\_relu1 (Activation (None, None, None, 0 ['stage2\_unit3\_bn1[0][0]']

) 128)

zero\_padding2d\_12 (ZeroPadding (None, None, None, 0 ['stage2\_unit3\_relu1[0][0]']

2D) 128)

stage2\_unit3\_conv1 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_12[0][0]']

128)

stage2\_unit3\_bn2 (BatchNormali (None, None, None, 512 ['stage2\_unit3\_conv1[0][0]']

zation) 128)

stage2\_unit3\_relu2 (Activation (None, None, None, 0 ['stage2\_unit3\_bn2[0][0]']

) 128)

zero\_padding2d\_13 (ZeroPadding (None, None, None, 0 ['stage2\_unit3\_relu2[0][0]']

2D) 128)

stage2\_unit3\_conv2 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_13[0][0]']

128)

add\_5 (Add) (None, None, None, 0 ['stage2\_unit3\_conv2[0][0]',

128) 'add\_4[0][0]']

stage2\_unit4\_bn1 (BatchNormali (None, None, None, 512 ['add\_5[0][0]']

zation) 128)

stage2\_unit4\_relu1 (Activation (None, None, None, 0 ['stage2\_unit4\_bn1[0][0]']

) 128)

zero\_padding2d\_14 (ZeroPadding (None, None, None, 0 ['stage2\_unit4\_relu1[0][0]']

2D) 128)

stage2\_unit4\_conv1 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_14[0][0]']

128)

stage2\_unit4\_bn2 (BatchNormali (None, None, None, 512 ['stage2\_unit4\_conv1[0][0]']

zation) 128)

stage2\_unit4\_relu2 (Activation (None, None, None, 0 ['stage2\_unit4\_bn2[0][0]']

) 128)

zero\_padding2d\_15 (ZeroPadding (None, None, None, 0 ['stage2\_unit4\_relu2[0][0]']

2D) 128)

stage2\_unit4\_conv2 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_15[0][0]']

128)

add\_6 (Add) (None, None, None, 0 ['stage2\_unit4\_conv2[0][0]',

128) 'add\_5[0][0]']

stage3\_unit1\_bn1 (BatchNormali (None, None, None, 512 ['add\_6[0][0]']

zation) 128)

stage3\_unit1\_relu1 (Activation (None, None, None, 0 ['stage3\_unit1\_bn1[0][0]']

) 128)

zero\_padding2d\_16 (ZeroPadding (None, None, None, 0 ['stage3\_unit1\_relu1[0][0]']

2D) 128)

stage3\_unit1\_conv1 (Conv2D) (None, None, None, 294912 ['zero\_padding2d\_16[0][0]']

256)

stage3\_unit1\_bn2 (BatchNormali (None, None, None, 1024 ['stage3\_unit1\_conv1[0][0]']

zation) 256)

stage3\_unit1\_relu2 (Activation (None, None, None, 0 ['stage3\_unit1\_bn2[0][0]']

) 256)

zero\_padding2d\_17 (ZeroPadding (None, None, None, 0 ['stage3\_unit1\_relu2[0][0]']

2D) 256)

stage3\_unit1\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_17[0][0]']

256)

stage3\_unit1\_sc (Conv2D) (None, None, None, 32768 ['stage3\_unit1\_relu1[0][0]']

256)

add\_7 (Add) (None, None, None, 0 ['stage3\_unit1\_conv2[0][0]',

256) 'stage3\_unit1\_sc[0][0]']

stage3\_unit2\_bn1 (BatchNormali (None, None, None, 1024 ['add\_7[0][0]']

zation) 256)

stage3\_unit2\_relu1 (Activation (None, None, None, 0 ['stage3\_unit2\_bn1[0][0]']

) 256)

zero\_padding2d\_18 (ZeroPadding (None, None, None, 0 ['stage3\_unit2\_relu1[0][0]']

2D) 256)

stage3\_unit2\_conv1 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_18[0][0]']

256)

stage3\_unit2\_bn2 (BatchNormali (None, None, None, 1024 ['stage3\_unit2\_conv1[0][0]']

zation) 256)

stage3\_unit2\_relu2 (Activation (None, None, None, 0 ['stage3\_unit2\_bn2[0][0]']

) 256)

zero\_padding2d\_19 (ZeroPadding (None, None, None, 0 ['stage3\_unit2\_relu2[0][0]']

2D) 256)

stage3\_unit2\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_19[0][0]']

256)

add\_8 (Add) (None, None, None, 0 ['stage3\_unit2\_conv2[0][0]',

256) 'add\_7[0][0]']

stage3\_unit3\_bn1 (BatchNormali (None, None, None, 1024 ['add\_8[0][0]']

zation) 256)

stage3\_unit3\_relu1 (Activation (None, None, None, 0 ['stage3\_unit3\_bn1[0][0]']

) 256)

zero\_padding2d\_20 (ZeroPadding (None, None, None, 0 ['stage3\_unit3\_relu1[0][0]']

2D) 256)

stage3\_unit3\_conv1 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_20[0][0]']

256)

stage3\_unit3\_bn2 (BatchNormali (None, None, None, 1024 ['stage3\_unit3\_conv1[0][0]']

zation) 256)

stage3\_unit3\_relu2 (Activation (None, None, None, 0 ['stage3\_unit3\_bn2[0][0]']

) 256)

zero\_padding2d\_21 (ZeroPadding (None, None, None, 0 ['stage3\_unit3\_relu2[0][0]']

2D) 256)

stage3\_unit3\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_21[0][0]']

256)

add\_9 (Add) (None, None, None, 0 ['stage3\_unit3\_conv2[0][0]',

256) 'add\_8[0][0]']

stage3\_unit4\_bn1 (BatchNormali (None, None, None, 1024 ['add\_9[0][0]']

zation) 256)

stage3\_unit4\_relu1 (Activation (None, None, None, 0 ['stage3\_unit4\_bn1[0][0]']

) 256)

zero\_padding2d\_22 (ZeroPadding (None, None, None, 0 ['stage3\_unit4\_relu1[0][0]']

2D) 256)

stage3\_unit4\_conv1 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_22[0][0]']

256)

stage3\_unit4\_bn2 (BatchNormali (None, None, None, 1024 ['stage3\_unit4\_conv1[0][0]']

zation) 256)

stage3\_unit4\_relu2 (Activation (None, None, None, 0 ['stage3\_unit4\_bn2[0][0]']

) 256)

zero\_padding2d\_23 (ZeroPadding (None, None, None, 0 ['stage3\_unit4\_relu2[0][0]']

2D) 256)

stage3\_unit4\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_23[0][0]']

256)

add\_10 (Add) (None, None, None, 0 ['stage3\_unit4\_conv2[0][0]',

256) 'add\_9[0][0]']

stage3\_unit5\_bn1 (BatchNormali (None, None, None, 1024 ['add\_10[0][0]']

zation) 256)

stage3\_unit5\_relu1 (Activation (None, None, None, 0 ['stage3\_unit5\_bn1[0][0]']

) 256)

zero\_padding2d\_24 (ZeroPadding (None, None, None, 0 ['stage3\_unit5\_relu1[0][0]']

2D) 256)

stage3\_unit5\_conv1 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_24[0][0]']

256)

stage3\_unit5\_bn2 (BatchNormali (None, None, None, 1024 ['stage3\_unit5\_conv1[0][0]']

zation) 256)

stage3\_unit5\_relu2 (Activation (None, None, None, 0 ['stage3\_unit5\_bn2[0][0]']

) 256)

zero\_padding2d\_25 (ZeroPadding (None, None, None, 0 ['stage3\_unit5\_relu2[0][0]']

2D) 256)

stage3\_unit5\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_25[0][0]']

256)

add\_11 (Add) (None, None, None, 0 ['stage3\_unit5\_conv2[0][0]',

256) 'add\_10[0][0]']

stage3\_unit6\_bn1 (BatchNormali (None, None, None, 1024 ['add\_11[0][0]']

zation) 256)

stage3\_unit6\_relu1 (Activation (None, None, None, 0 ['stage3\_unit6\_bn1[0][0]']

) 256)

zero\_padding2d\_26 (ZeroPadding (None, None, None, 0 ['stage3\_unit6\_relu1[0][0]']

2D) 256)

stage3\_unit6\_conv1 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_26[0][0]']

256)

stage3\_unit6\_bn2 (BatchNormali (None, None, None, 1024 ['stage3\_unit6\_conv1[0][0]']

zation) 256)

stage3\_unit6\_relu2 (Activation (None, None, None, 0 ['stage3\_unit6\_bn2[0][0]']

) 256)

zero\_padding2d\_27 (ZeroPadding (None, None, None, 0 ['stage3\_unit6\_relu2[0][0]']

2D) 256)

stage3\_unit6\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_27[0][0]']

256)

add\_12 (Add) (None, None, None, 0 ['stage3\_unit6\_conv2[0][0]',

256) 'add\_11[0][0]']

stage4\_unit1\_bn1 (BatchNormali (None, None, None, 1024 ['add\_12[0][0]']

zation) 256)

stage4\_unit1\_relu1 (Activation (None, None, None, 0 ['stage4\_unit1\_bn1[0][0]']

) 256)

zero\_padding2d\_28 (ZeroPadding (None, None, None, 0 ['stage4\_unit1\_relu1[0][0]']

2D) 256)

stage4\_unit1\_conv1 (Conv2D) (None, None, None, 1179648 ['zero\_padding2d\_28[0][0]']

512)

stage4\_unit1\_bn2 (BatchNormali (None, None, None, 2048 ['stage4\_unit1\_conv1[0][0]']

zation) 512)

stage4\_unit1\_relu2 (Activation (None, None, None, 0 ['stage4\_unit1\_bn2[0][0]']

) 512)

zero\_padding2d\_29 (ZeroPadding (None, None, None, 0 ['stage4\_unit1\_relu2[0][0]']

2D) 512)

stage4\_unit1\_conv2 (Conv2D) (None, None, None, 2359296 ['zero\_padding2d\_29[0][0]']

512)

stage4\_unit1\_sc (Conv2D) (None, None, None, 131072 ['stage4\_unit1\_relu1[0][0]']

512)

add\_13 (Add) (None, None, None, 0 ['stage4\_unit1\_conv2[0][0]',

512) 'stage4\_unit1\_sc[0][0]']

stage4\_unit2\_bn1 (BatchNormali (None, None, None, 2048 ['add\_13[0][0]']

zation) 512)

stage4\_unit2\_relu1 (Activation (None, None, None, 0 ['stage4\_unit2\_bn1[0][0]']

) 512)

zero\_padding2d\_30 (ZeroPadding (None, None, None, 0 ['stage4\_unit2\_relu1[0][0]']

2D) 512)

stage4\_unit2\_conv1 (Conv2D) (None, None, None, 2359296 ['zero\_padding2d\_30[0][0]']

512)

stage4\_unit2\_bn2 (BatchNormali (None, None, None, 2048 ['stage4\_unit2\_conv1[0][0]']

zation) 512)

stage4\_unit2\_relu2 (Activation (None, None, None, 0 ['stage4\_unit2\_bn2[0][0]']

) 512)

zero\_padding2d\_31 (ZeroPadding (None, None, None, 0 ['stage4\_unit2\_relu2[0][0]']

2D) 512)

stage4\_unit2\_conv2 (Conv2D) (None, None, None, 2359296 ['zero\_padding2d\_31[0][0]']

512)

add\_14 (Add) (None, None, None, 0 ['stage4\_unit2\_conv2[0][0]',

512) 'add\_13[0][0]']

stage4\_unit3\_bn1 (BatchNormali (None, None, None, 2048 ['add\_14[0][0]']

zation) 512)

stage4\_unit3\_relu1 (Activation (None, None, None, 0 ['stage4\_unit3\_bn1[0][0]']

) 512)

zero\_padding2d\_32 (ZeroPadding (None, None, None, 0 ['stage4\_unit3\_relu1[0][0]']

2D) 512)

stage4\_unit3\_conv1 (Conv2D) (None, None, None, 2359296 ['zero\_padding2d\_32[0][0]']

512)

stage4\_unit3\_bn2 (BatchNormali (None, None, None, 2048 ['stage4\_unit3\_conv1[0][0]']

zation) 512)

stage4\_unit3\_relu2 (Activation (None, None, None, 0 ['stage4\_unit3\_bn2[0][0]']

) 512)

zero\_padding2d\_33 (ZeroPadding (None, None, None, 0 ['stage4\_unit3\_relu2[0][0]']

2D) 512)

stage4\_unit3\_conv2 (Conv2D) (None, None, None, 2359296 ['zero\_padding2d\_33[0][0]']

512)

add\_15 (Add) (None, None, None, 0 ['stage4\_unit3\_conv2[0][0]',

512) 'add\_14[0][0]']

bn1 (BatchNormalization) (None, None, None, 2048 ['add\_15[0][0]']

512)

relu1 (Activation) (None, None, None, 0 ['bn1[0][0]']

512)

decoder\_stage0\_upsampling (UpS (None, None, None, 0 ['relu1[0][0]']

ampling2D) 512)

decoder\_stage0\_concat (Concate (None, None, None, 0 ['decoder\_stage0\_upsampling[0][0]

nate) 768) ',

'stage4\_unit1\_relu1[0][0]']

decoder\_stage0a\_conv (Conv2D) (None, None, None, 1769472 ['decoder\_stage0\_concat[0][0]']

256)

decoder\_stage0a\_bn (BatchNorma (None, None, None, 1024 ['decoder\_stage0a\_conv[0][0]']

lization) 256)

decoder\_stage0a\_relu (Activati (None, None, None, 0 ['decoder\_stage0a\_bn[0][0]']

on) 256)

decoder\_stage0b\_conv (Conv2D) (None, None, None, 589824 ['decoder\_stage0a\_relu[0][0]']

256)

decoder\_stage0b\_bn (BatchNorma (None, None, None, 1024 ['decoder\_stage0b\_conv[0][0]']

lization) 256)

decoder\_stage0b\_relu (Activati (None, None, None, 0 ['decoder\_stage0b\_bn[0][0]']

on) 256)

decoder\_stage1\_upsampling (UpS (None, None, None, 0 ['decoder\_stage0b\_relu[0][0]']

ampling2D) 256)

decoder\_stage1\_concat (Concate (None, None, None, 0 ['decoder\_stage1\_upsampling[0][0]

nate) 384) ',

'stage3\_unit1\_relu1[0][0]']

decoder\_stage1a\_conv (Conv2D) (None, None, None, 442368 ['decoder\_stage1\_concat[0][0]']

128)

decoder\_stage1a\_bn (BatchNorma (None, None, None, 512 ['decoder\_stage1a\_conv[0][0]']

lization) 128)

decoder\_stage1a\_relu (Activati (None, None, None, 0 ['decoder\_stage1a\_bn[0][0]']

on) 128)

decoder\_stage1b\_conv (Conv2D) (None, None, None, 147456 ['decoder\_stage1a\_relu[0][0]']

128)

decoder\_stage1b\_bn (BatchNorma (None, None, None, 512 ['decoder\_stage1b\_conv[0][0]']

lization) 128)

decoder\_stage1b\_relu (Activati (None, None, None, 0 ['decoder\_stage1b\_bn[0][0]']

on) 128)

decoder\_stage2\_upsampling (UpS (None, None, None, 0 ['decoder\_stage1b\_relu[0][0]']

ampling2D) 128)

decoder\_stage2\_concat (Concate (None, None, None, 0 ['decoder\_stage2\_upsampling[0][0]

nate) 192) ',

'stage2\_unit1\_relu1[0][0]']

decoder\_stage2a\_conv (Conv2D) (None, None, None, 110592 ['decoder\_stage2\_concat[0][0]']

64)

decoder\_stage2a\_bn (BatchNorma (None, None, None, 256 ['decoder\_stage2a\_conv[0][0]']

lization) 64)

decoder\_stage2a\_relu (Activati (None, None, None, 0 ['decoder\_stage2a\_bn[0][0]']

on) 64)

decoder\_stage2b\_conv (Conv2D) (None, None, None, 36864 ['decoder\_stage2a\_relu[0][0]']

64)

decoder\_stage2b\_bn (BatchNorma (None, None, None, 256 ['decoder\_stage2b\_conv[0][0]']

lization) 64)

decoder\_stage2b\_relu (Activati (None, None, None, 0 ['decoder\_stage2b\_bn[0][0]']

on) 64)

decoder\_stage3\_upsampling (UpS (None, None, None, 0 ['decoder\_stage2b\_relu[0][0]']

ampling2D) 64)

decoder\_stage3\_concat (Concate (None, None, None, 0 ['decoder\_stage3\_upsampling[0][0]

nate) 128) ',

'relu0[0][0]']

decoder\_stage3a\_conv (Conv2D) (None, None, None, 36864 ['decoder\_stage3\_concat[0][0]']

32)

decoder\_stage3a\_bn (BatchNorma (None, None, None, 128 ['decoder\_stage3a\_conv[0][0]']

lization) 32)

decoder\_stage3a\_relu (Activati (None, None, None, 0 ['decoder\_stage3a\_bn[0][0]']

on) 32)

decoder\_stage3b\_conv (Conv2D) (None, None, None, 9216 ['decoder\_stage3a\_relu[0][0]']

32)

decoder\_stage3b\_bn (BatchNorma (None, None, None, 128 ['decoder\_stage3b\_conv[0][0]']

lization) 32)

decoder\_stage3b\_relu (Activati (None, None, None, 0 ['decoder\_stage3b\_bn[0][0]']

on) 32)

decoder\_stage4\_upsampling (UpS (None, None, None, 0 ['decoder\_stage3b\_relu[0][0]']

ampling2D) 32)

decoder\_stage4a\_conv (Conv2D) (None, None, None, 4608 ['decoder\_stage4\_upsampling[0][0]

16) ']

decoder\_stage4a\_bn (BatchNorma (None, None, None, 64 ['decoder\_stage4a\_conv[0][0]']

lization) 16)

decoder\_stage4a\_relu (Activati (None, None, None, 0 ['decoder\_stage4a\_bn[0][0]']

on) 16)

decoder\_stage4b\_conv (Conv2D) (None, None, None, 2304 ['decoder\_stage4a\_relu[0][0]']

16)

decoder\_stage4b\_bn (BatchNorma (None, None, None, 64 ['decoder\_stage4b\_conv[0][0]']

lization) 16)

decoder\_stage4b\_relu (Activati (None, None, None, 0 ['decoder\_stage4b\_bn[0][0]']

on) 16)

final\_conv (Conv2D) (None, None, None, 145 ['decoder\_stage4b\_relu[0][0]']

1)

==================================================================================================

Total params: 24,456,154

Trainable params: 24,438,804

Non-trainable params: 17,350

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None

#Input shape to the model is 224 x 224. SO resize input image to this shape.

from tensorflow.keras.utils import load\_img, img\_to\_array

img10 = load\_img('/content/drive/MyDrive/oral cancer Images/OralCancer\_Kaggle/train/resized cancer/10.png', target\_size=(224, 224)) #VGG user 224 as input

img2 = load\_img('/content/drive/MyDrive/oral cancer Images/OralCancer\_Kaggle/train/resized cancer/100.jpg', target\_size=(224, 224)) #VGG user 224 as input

img3 = load\_img('/content/drive/MyDrive/oral cancer Images/OralCancer\_Kaggle/train/resized cancer/107.jpeg', target\_size=(224, 224)) #VGG user 224 as input

# convert the image to an array

img1 = img\_to\_array(img10)

img2 = img\_to\_array(img2)

img3 = img\_to\_array(img3)

# expand dimensions to match the shape of model input

img11 = np.expand\_dims(img1, axis=0)

img22 = np.expand\_dims(img2, axis=0)

img33 = np.expand\_dims(img3, axis=0)

# Generate feature output by predicting on the input image

feature\_output1 = model\_short1.predict(img11)

columns = 8

rows = 8

for ftr in feature\_output1:

#pos = 1

fig=plt.figure(figsize=(12, 12))

for i in range(1, columns\*rows +1):

fig =plt.subplot(rows, columns, i)

fig.set\_xticks([]) #Turn off axis

fig.set\_yticks([])

plt.imshow(ftr[0, :, :, i-1], cmap='gray')

#pos += 1

plt.show()

