###Model 4

metrics = [sm.metrics.IOUScore(threshold=0.5), sm.metrics.FScore(threshold=0.5)]

#Reused parameters in all models

n\_classes=1

activation='sigmoid'

LR = 0.0001

optim = tf.keras.optimizers.Adam(LR)

BACKBONE4 = 'resnet101'

preprocess\_input4 = sm.get\_preprocessing(BACKBONE4)

# preprocess input

X\_train4 = preprocess\_input4(X1)

X\_test4 = preprocess\_input4(X\_test)

# define model

model4 = sm.Unet(BACKBONE4, encoder\_weights='imagenet', classes=n\_classes, activation=activation)

# compile keras model with defined optimozer, loss and metrics

model4.compile(optim, loss='binary\_crossentropy', metrics=metrics)

model4 = sm.Unet(BACKBONE4, encoder\_weights='imagenet', classes=n\_classes, activation=activation)

# compile keras model with defined optimozer, loss and metrics

model4.compile(optim, loss='binary\_crossentropy', metrics=metrics)

history4=model4.fit(X1,

y1,

batch\_size=8,

epochs=50,

verbose=1,

validation\_data=(X\_test, y\_test))

Epoch 1/50

11/11 [==============================] - 431s 38s/step - loss: 0.5196 - iou\_score: 0.0649 - f1-score: 0.1214 - val\_loss: 0.8215 - val\_iou\_score: 0.0710 - val\_f1-score: 0.1319

Epoch 2/50

11/11 [==============================] - 396s 36s/step - loss: 0.4455 - iou\_score: 0.1305 - f1-score: 0.2295 - val\_loss: 1.3273 - val\_iou\_score: 0.0680 - val\_f1-score: 0.1268

Epoch 3/50

11/11 [==============================] - 394s 36s/step - loss: 0.3819 - iou\_score: 0.2342 - f1-score: 0.3762 - val\_loss: 1.3762 - val\_iou\_score: 0.0729 - val\_f1-score: 0.1354

Epoch 4/50

11/11 [==============================] - 398s 37s/step - loss: 0.3349 - iou\_score: 0.3324 - f1-score: 0.4935 - val\_loss: 1.0159 - val\_iou\_score: 0.0840 - val\_f1-score: 0.1543

Epoch 5/50

11/11 [==============================] - 395s 36s/step - loss: 0.2994 - iou\_score: 0.3789 - f1-score: 0.5480 - val\_loss: 0.8363 - val\_iou\_score: 0.0939 - val\_f1-score: 0.1710

Epoch 6/50

11/11 [==============================] - 394s 36s/step - loss: 0.2794 - iou\_score: 0.3996 - f1-score: 0.5690 - val\_loss: 0.8691 - val\_iou\_score: 0.0965 - val\_f1-score: 0.1753

Epoch 7/50

11/11 [==============================] - 399s 37s/step - loss: 0.2531 - iou\_score: 0.4654 - f1-score: 0.6319 - val\_loss: 0.6086 - val\_iou\_score: 0.1174 - val\_f1-score: 0.2092

Epoch 8/50

11/11 [==============================] - 392s 36s/step - loss: 0.2403 - iou\_score: 0.4516 - f1-score: 0.6162 - val\_loss: 0.4035 - val\_iou\_score: 0.0876 - val\_f1-score: 0.1578

Epoch 9/50

11/11 [==============================] - 403s 37s/step - loss: 0.2291 - iou\_score: 0.4544 - f1-score: 0.6206 - val\_loss: 0.3585 - val\_iou\_score: 0.0415 - val\_f1-score: 0.0772

Epoch 10/50

11/11 [==============================] - 395s 36s/step - loss: 0.2136 - iou\_score: 0.5053 - f1-score: 0.6696 - val\_loss: 0.3324 - val\_iou\_score: 0.0069 - val\_f1-score: 0.0136

Epoch 11/50

11/11 [==============================] - 393s 36s/step - loss: 0.1984 - iou\_score: 0.5515 - f1-score: 0.7071 - val\_loss: 0.3259 - val\_iou\_score: 0.0264 - val\_f1-score: 0.0513

Epoch 12/50

11/11 [==============================] - 397s 36s/step - loss: 0.1933 - iou\_score: 0.5491 - f1-score: 0.7064 - val\_loss: 0.2986 - val\_iou\_score: 0.0113 - val\_f1-score: 0.0223

Epoch 13/50

11/11 [==============================] - 396s 36s/step - loss: 0.1794 - iou\_score: 0.5782 - f1-score: 0.7299 - val\_loss: 0.2838 - val\_iou\_score: 0.0143 - val\_f1-score: 0.0281

Epoch 14/50

11/11 [==============================] - 394s 36s/step - loss: 0.1725 - iou\_score: 0.5871 - f1-score: 0.7358 - val\_loss: 0.2782 - val\_iou\_score: 0.0481 - val\_f1-score: 0.0915

Epoch 15/50

11/11 [==============================] - 396s 36s/step - loss: 0.1609 - iou\_score: 0.6237 - f1-score: 0.7669 - val\_loss: 0.2623 - val\_iou\_score: 0.0059 - val\_f1-score: 0.0116

Epoch 16/50

11/11 [==============================] - 395s 36s/step - loss: 0.1568 - iou\_score: 0.6255 - f1-score: 0.7677 - val\_loss: 0.2543 - val\_iou\_score: 0.0319 - val\_f1-score: 0.0615

Epoch 17/50

11/11 [==============================] - 395s 36s/step - loss: 0.1487 - iou\_score: 0.6385 - f1-score: 0.7778 - val\_loss: 0.2506 - val\_iou\_score: 0.0251 - val\_f1-score: 0.0488

Epoch 18/50

11/11 [==============================] - 396s 36s/step - loss: 0.1398 - iou\_score: 0.6663 - f1-score: 0.7983 - val\_loss: 0.2442 - val\_iou\_score: 0.0187 - val\_f1-score: 0.0364

Epoch 19/50

11/11 [==============================] - 395s 36s/step - loss: 0.1365 - iou\_score: 0.6603 - f1-score: 0.7920 - val\_loss: 0.2395 - val\_iou\_score: 0.0327 - val\_f1-score: 0.0630

Epoch 20/50

11/11 [==============================] - 392s 36s/step - loss: 0.1283 - iou\_score: 0.6943 - f1-score: 0.8181 - val\_loss: 0.2362 - val\_iou\_score: 0.0323 - val\_f1-score: 0.0621

Epoch 21/50

11/11 [==============================] - 395s 36s/step - loss: 0.1233 - iou\_score: 0.7094 - f1-score: 0.8294 - val\_loss: 0.2322 - val\_iou\_score: 0.0216 - val\_f1-score: 0.0421

Epoch 22/50

11/11 [==============================] - 394s 36s/step - loss: 0.1186 - iou\_score: 0.7111 - f1-score: 0.8305 - val\_loss: 0.2309 - val\_iou\_score: 0.0296 - val\_f1-score: 0.0569

Epoch 23/50

11/11 [==============================] - 399s 36s/step - loss: 0.1133 - iou\_score: 0.7249 - f1-score: 0.8395 - val\_loss: 0.2276 - val\_iou\_score: 0.0174 - val\_f1-score: 0.0340

Epoch 24/50

11/11 [==============================] - 394s 36s/step - loss: 0.1090 - iou\_score: 0.7275 - f1-score: 0.8420 - val\_loss: 0.2261 - val\_iou\_score: 0.0277 - val\_f1-score: 0.0538

Epoch 25/50

11/11 [==============================] - 397s 36s/step - loss: 0.1046 - iou\_score: 0.7388 - f1-score: 0.8488 - val\_loss: 0.2240 - val\_iou\_score: 0.0263 - val\_f1-score: 0.0509

Epoch 26/50

11/11 [==============================] - 392s 36s/step - loss: 0.1016 - iou\_score: 0.7387 - f1-score: 0.8493 - val\_loss: 0.2250 - val\_iou\_score: 0.0318 - val\_f1-score: 0.0614

Epoch 27/50

11/11 [==============================] - 390s 36s/step - loss: 0.0986 - iou\_score: 0.7329 - f1-score: 0.8438 - val\_loss: 0.2225 - val\_iou\_score: 0.0188 - val\_f1-score: 0.0368

Epoch 28/50

11/11 [==============================] - 391s 36s/step - loss: 0.0947 - iou\_score: 0.7527 - f1-score: 0.8580 - val\_loss: 0.2245 - val\_iou\_score: 0.0258 - val\_f1-score: 0.0499

Epoch 29/50

11/11 [==============================] - 393s 36s/step - loss: 0.0911 - iou\_score: 0.7572 - f1-score: 0.8589 - val\_loss: 0.2236 - val\_iou\_score: 0.0236 - val\_f1-score: 0.0456

Epoch 30/50

11/11 [==============================] - 390s 36s/step - loss: 0.0895 - iou\_score: 0.7480 - f1-score: 0.8542 - val\_loss: 0.2251 - val\_iou\_score: 0.0300 - val\_f1-score: 0.0579

Epoch 31/50

11/11 [==============================] - 392s 36s/step - loss: 0.0867 - iou\_score: 0.7604 - f1-score: 0.8636 - val\_loss: 0.2217 - val\_iou\_score: 0.0147 - val\_f1-score: 0.0287

Epoch 32/50

11/11 [==============================] - 392s 36s/step - loss: 0.0819 - iou\_score: 0.7796 - f1-score: 0.8755 - val\_loss: 0.2247 - val\_iou\_score: 0.0242 - val\_f1-score: 0.0469

Epoch 33/50

11/11 [==============================] - 390s 36s/step - loss: 0.0799 - iou\_score: 0.7694 - f1-score: 0.8682 - val\_loss: 0.2237 - val\_iou\_score: 0.0198 - val\_f1-score: 0.0385

Epoch 34/50

11/11 [==============================] - 395s 36s/step - loss: 0.0777 - iou\_score: 0.7802 - f1-score: 0.8741 - val\_loss: 0.2234 - val\_iou\_score: 0.0187 - val\_f1-score: 0.0363

Epoch 35/50

11/11 [==============================] - 391s 36s/step - loss: 0.0751 - iou\_score: 0.7812 - f1-score: 0.8755 - val\_loss: 0.2249 - val\_iou\_score: 0.0253 - val\_f1-score: 0.0490

Epoch 36/50

11/11 [==============================] - 392s 36s/step - loss: 0.0733 - iou\_score: 0.7930 - f1-score: 0.8833 - val\_loss: 0.2250 - val\_iou\_score: 0.0275 - val\_f1-score: 0.0530

Epoch 37/50

11/11 [==============================] - 392s 36s/step - loss: 0.0709 - iou\_score: 0.7904 - f1-score: 0.8803 - val\_loss: 0.2243 - val\_iou\_score: 0.0291 - val\_f1-score: 0.0558

Epoch 38/50

11/11 [==============================] - 391s 36s/step - loss: 0.0678 - iou\_score: 0.7992 - f1-score: 0.8871 - val\_loss: 0.2265 - val\_iou\_score: 0.0350 - val\_f1-score: 0.0673

Epoch 39/50

11/11 [==============================] - 393s 36s/step - loss: 0.0663 - iou\_score: 0.8068 - f1-score: 0.8923 - val\_loss: 0.2256 - val\_iou\_score: 0.0197 - val\_f1-score: 0.0383

Epoch 40/50

11/11 [==============================] - 390s 36s/step - loss: 0.0665 - iou\_score: 0.7948 - f1-score: 0.8846 - val\_loss: 0.2261 - val\_iou\_score: 0.0322 - val\_f1-score: 0.0617

Epoch 41/50

11/11 [==============================] - 392s 36s/step - loss: 0.0643 - iou\_score: 0.7978 - f1-score: 0.8861 - val\_loss: 0.2293 - val\_iou\_score: 0.0327 - val\_f1-score: 0.0626

Epoch 42/50

11/11 [==============================] - 390s 36s/step - loss: 0.0620 - iou\_score: 0.8064 - f1-score: 0.8919 - val\_loss: 0.2285 - val\_iou\_score: 0.0300 - val\_f1-score: 0.0579

Epoch 43/50

11/11 [==============================] - 393s 36s/step - loss: 0.0603 - iou\_score: 0.8105 - f1-score: 0.8949 - val\_loss: 0.2294 - val\_iou\_score: 0.0274 - val\_f1-score: 0.0529

Epoch 44/50

11/11 [==============================] - 392s 36s/step - loss: 0.0578 - iou\_score: 0.8182 - f1-score: 0.8991 - val\_loss: 0.2309 - val\_iou\_score: 0.0255 - val\_f1-score: 0.0493

Epoch 45/50

11/11 [==============================] - 399s 36s/step - loss: 0.0564 - iou\_score: 0.8245 - f1-score: 0.9030 - val\_loss: 0.2298 - val\_iou\_score: 0.0189 - val\_f1-score: 0.0367

Epoch 46/50

11/11 [==============================] - 393s 36s/step - loss: 0.0556 - iou\_score: 0.8171 - f1-score: 0.8977 - val\_loss: 0.2300 - val\_iou\_score: 0.0263 - val\_f1-score: 0.0508

Epoch 47/50

11/11 [==============================] - 393s 36s/step - loss: 0.0533 - iou\_score: 0.8287 - f1-score: 0.9056 - val\_loss: 0.2302 - val\_iou\_score: 0.0199 - val\_f1-score: 0.0386

Epoch 48/50

11/11 [==============================] - 393s 36s/step - loss: 0.0536 - iou\_score: 0.8193 - f1-score: 0.8993 - val\_loss: 0.2301 - val\_iou\_score: 0.0230 - val\_f1-score: 0.0446

Epoch 49/50

11/11 [==============================] - 394s 36s/step - loss: 0.0527 - iou\_score: 0.8277 - f1-score: 0.9046 - val\_loss: 0.2305 - val\_iou\_score: 0.0233 - val\_f1-score: 0.0450

Epoch 50/50

11/11 [==============================] - 396s 36s/step - loss: 0.0512 - iou\_score: 0.8166 - f1-score: 0.8967 - val\_loss: 0.2326 - val\_iou\_score: 0.0226 - val\_f1-score: 0.0439

MODEL SUMMARY

Downloading data from<https://github.com/qubvel/classification_models/releases/download/0.0.1/resnet101_imagenet_1000_no_top.h5>

171171840/171164896 [==============================] - 2s 0us/step

171180032/171164896 [==============================] - 2s 0us/step

Model: "model\_6"

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

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\_69 (ZeroPadding (None, None, None, 0 ['bn\_data[0][0]']

2D) 3)

conv0 (Conv2D) (None, None, None, 9408 ['zero\_padding2d\_69[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\_70 (ZeroPadding (None, None, None, 0 ['relu0[0][0]']

2D) 64)

pooling0 (MaxPooling2D) (None, None, None, 0 ['zero\_padding2d\_70[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)

stage1\_unit1\_conv1 (Conv2D) (None, None, None, 4096 ['stage1\_unit1\_relu1[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\_71 (ZeroPadding (None, None, None, 0 ['stage1\_unit1\_relu2[0][0]']

2D) 64)

stage1\_unit1\_conv2 (Conv2D) (None, None, None, 36864 ['zero\_padding2d\_71[0][0]']

64)

stage1\_unit1\_bn3 (BatchNormali (None, None, None, 256 ['stage1\_unit1\_conv2[0][0]']

zation) 64)

stage1\_unit1\_relu3 (Activation (None, None, None, 0 ['stage1\_unit1\_bn3[0][0]']

) 64)

stage1\_unit1\_conv3 (Conv2D) (None, None, None, 16384 ['stage1\_unit1\_relu3[0][0]']

256)

stage1\_unit1\_sc (Conv2D) (None, None, None, 16384 ['stage1\_unit1\_relu1[0][0]']

256)

add\_49 (Add) (None, None, None, 0 ['stage1\_unit1\_conv3[0][0]',

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

stage1\_unit2\_bn1 (BatchNormali (None, None, None, 1024 ['add\_49[0][0]']

zation) 256)

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

) 256)

stage1\_unit2\_conv1 (Conv2D) (None, None, None, 16384 ['stage1\_unit2\_relu1[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\_72 (ZeroPadding (None, None, None, 0 ['stage1\_unit2\_relu2[0][0]']

2D) 64)

stage1\_unit2\_conv2 (Conv2D) (None, None, None, 36864 ['zero\_padding2d\_72[0][0]']

64)

stage1\_unit2\_bn3 (BatchNormali (None, None, None, 256 ['stage1\_unit2\_conv2[0][0]']

zation) 64)

stage1\_unit2\_relu3 (Activation (None, None, None, 0 ['stage1\_unit2\_bn3[0][0]']

) 64)

stage1\_unit2\_conv3 (Conv2D) (None, None, None, 16384 ['stage1\_unit2\_relu3[0][0]']

256)

add\_50 (Add) (None, None, None, 0 ['stage1\_unit2\_conv3[0][0]',

256) 'add\_49[0][0]']

stage1\_unit3\_bn1 (BatchNormali (None, None, None, 1024 ['add\_50[0][0]']

zation) 256)

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

) 256)

stage1\_unit3\_conv1 (Conv2D) (None, None, None, 16384 ['stage1\_unit3\_relu1[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\_73 (ZeroPadding (None, None, None, 0 ['stage1\_unit3\_relu2[0][0]']

2D) 64)

stage1\_unit3\_conv2 (Conv2D) (None, None, None, 36864 ['zero\_padding2d\_73[0][0]']

64)

stage1\_unit3\_bn3 (BatchNormali (None, None, None, 256 ['stage1\_unit3\_conv2[0][0]']

zation) 64)

stage1\_unit3\_relu3 (Activation (None, None, None, 0 ['stage1\_unit3\_bn3[0][0]']

) 64)

stage1\_unit3\_conv3 (Conv2D) (None, None, None, 16384 ['stage1\_unit3\_relu3[0][0]']

256)

add\_51 (Add) (None, None, None, 0 ['stage1\_unit3\_conv3[0][0]',

256) 'add\_50[0][0]']

stage2\_unit1\_bn1 (BatchNormali (None, None, None, 1024 ['add\_51[0][0]']

zation) 256)

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

) 256)

stage2\_unit1\_conv1 (Conv2D) (None, None, None, 32768 ['stage2\_unit1\_relu1[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\_74 (ZeroPadding (None, None, None, 0 ['stage2\_unit1\_relu2[0][0]']

2D) 128)

stage2\_unit1\_conv2 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_74[0][0]']

128)

stage2\_unit1\_bn3 (BatchNormali (None, None, None, 512 ['stage2\_unit1\_conv2[0][0]']

zation) 128)

stage2\_unit1\_relu3 (Activation (None, None, None, 0 ['stage2\_unit1\_bn3[0][0]']

) 128)

stage2\_unit1\_conv3 (Conv2D) (None, None, None, 65536 ['stage2\_unit1\_relu3[0][0]']

512)

stage2\_unit1\_sc (Conv2D) (None, None, None, 131072 ['stage2\_unit1\_relu1[0][0]']

512)

add\_52 (Add) (None, None, None, 0 ['stage2\_unit1\_conv3[0][0]',

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

stage2\_unit2\_bn1 (BatchNormali (None, None, None, 2048 ['add\_52[0][0]']

zation) 512)

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

) 512)

stage2\_unit2\_conv1 (Conv2D) (None, None, None, 65536 ['stage2\_unit2\_relu1[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\_75 (ZeroPadding (None, None, None, 0 ['stage2\_unit2\_relu2[0][0]']

2D) 128)

stage2\_unit2\_conv2 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_75[0][0]']

128)

stage2\_unit2\_bn3 (BatchNormali (None, None, None, 512 ['stage2\_unit2\_conv2[0][0]']

zation) 128)

stage2\_unit2\_relu3 (Activation (None, None, None, 0 ['stage2\_unit2\_bn3[0][0]']

) 128)

stage2\_unit2\_conv3 (Conv2D) (None, None, None, 65536 ['stage2\_unit2\_relu3[0][0]']

512)

add\_53 (Add) (None, None, None, 0 ['stage2\_unit2\_conv3[0][0]',

512) 'add\_52[0][0]']

stage2\_unit3\_bn1 (BatchNormali (None, None, None, 2048 ['add\_53[0][0]']

zation) 512)

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

) 512)

stage2\_unit3\_conv1 (Conv2D) (None, None, None, 65536 ['stage2\_unit3\_relu1[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\_76 (ZeroPadding (None, None, None, 0 ['stage2\_unit3\_relu2[0][0]']

2D) 128)

stage2\_unit3\_conv2 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_76[0][0]']

128)

stage2\_unit3\_bn3 (BatchNormali (None, None, None, 512 ['stage2\_unit3\_conv2[0][0]']

zation) 128)

stage2\_unit3\_relu3 (Activation (None, None, None, 0 ['stage2\_unit3\_bn3[0][0]']

) 128)

stage2\_unit3\_conv3 (Conv2D) (None, None, None, 65536 ['stage2\_unit3\_relu3[0][0]']

512)

add\_54 (Add) (None, None, None, 0 ['stage2\_unit3\_conv3[0][0]',

512) 'add\_53[0][0]']

stage2\_unit4\_bn1 (BatchNormali (None, None, None, 2048 ['add\_54[0][0]']

zation) 512)

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

) 512)

stage2\_unit4\_conv1 (Conv2D) (None, None, None, 65536 ['stage2\_unit4\_relu1[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\_77 (ZeroPadding (None, None, None, 0 ['stage2\_unit4\_relu2[0][0]']

2D) 128)

stage2\_unit4\_conv2 (Conv2D) (None, None, None, 147456 ['zero\_padding2d\_77[0][0]']

128)

stage2\_unit4\_bn3 (BatchNormali (None, None, None, 512 ['stage2\_unit4\_conv2[0][0]']

zation) 128)

stage2\_unit4\_relu3 (Activation (None, None, None, 0 ['stage2\_unit4\_bn3[0][0]']

) 128)

stage2\_unit4\_conv3 (Conv2D) (None, None, None, 65536 ['stage2\_unit4\_relu3[0][0]']

512)

add\_55 (Add) (None, None, None, 0 ['stage2\_unit4\_conv3[0][0]',

512) 'add\_54[0][0]']

stage3\_unit1\_bn1 (BatchNormali (None, None, None, 2048 ['add\_55[0][0]']

zation) 512)

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

) 512)

stage3\_unit1\_conv1 (Conv2D) (None, None, None, 131072 ['stage3\_unit1\_relu1[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\_78 (ZeroPadding (None, None, None, 0 ['stage3\_unit1\_relu2[0][0]']

2D) 256)

stage3\_unit1\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_78[0][0]']

256)

stage3\_unit1\_bn3 (BatchNormali (None, None, None, 1024 ['stage3\_unit1\_conv2[0][0]']

zation) 256)

stage3\_unit1\_relu3 (Activation (None, None, None, 0 ['stage3\_unit1\_bn3[0][0]']

) 256)

stage3\_unit1\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit1\_relu3[0][0]']

1024)

stage3\_unit1\_sc (Conv2D) (None, None, None, 524288 ['stage3\_unit1\_relu1[0][0]']

1024)

add\_56 (Add) (None, None, None, 0 ['stage3\_unit1\_conv3[0][0]',

1024) 'stage3\_unit1\_sc[0][0]']

stage3\_unit2\_bn1 (BatchNormali (None, None, None, 4096 ['add\_56[0][0]']

zation) 1024)

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

) 1024)

stage3\_unit2\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit2\_relu1[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\_79 (ZeroPadding (None, None, None, 0 ['stage3\_unit2\_relu2[0][0]']

2D) 256)

stage3\_unit2\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_79[0][0]']

256)

stage3\_unit2\_bn3 (BatchNormali (None, None, None, 1024 ['stage3\_unit2\_conv2[0][0]']

zation) 256)

stage3\_unit2\_relu3 (Activation (None, None, None, 0 ['stage3\_unit2\_bn3[0][0]']

) 256)

stage3\_unit2\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit2\_relu3[0][0]']

1024)

add\_57 (Add) (None, None, None, 0 ['stage3\_unit2\_conv3[0][0]',

1024) 'add\_56[0][0]']

stage3\_unit3\_bn1 (BatchNormali (None, None, None, 4096 ['add\_57[0][0]']

zation) 1024)

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

) 1024)

stage3\_unit3\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit3\_relu1[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\_80 (ZeroPadding (None, None, None, 0 ['stage3\_unit3\_relu2[0][0]']

2D) 256)

stage3\_unit3\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_80[0][0]']

256)

stage3\_unit3\_bn3 (BatchNormali (None, None, None, 1024 ['stage3\_unit3\_conv2[0][0]']

zation) 256)

stage3\_unit3\_relu3 (Activation (None, None, None, 0 ['stage3\_unit3\_bn3[0][0]']

) 256)

stage3\_unit3\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit3\_relu3[0][0]']

1024)

add\_58 (Add) (None, None, None, 0 ['stage3\_unit3\_conv3[0][0]',

1024) 'add\_57[0][0]']

stage3\_unit4\_bn1 (BatchNormali (None, None, None, 4096 ['add\_58[0][0]']

zation) 1024)

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

) 1024)

stage3\_unit4\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit4\_relu1[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\_81 (ZeroPadding (None, None, None, 0 ['stage3\_unit4\_relu2[0][0]']

2D) 256)

stage3\_unit4\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_81[0][0]']

256)

stage3\_unit4\_bn3 (BatchNormali (None, None, None, 1024 ['stage3\_unit4\_conv2[0][0]']

zation) 256)

stage3\_unit4\_relu3 (Activation (None, None, None, 0 ['stage3\_unit4\_bn3[0][0]']

) 256)

stage3\_unit4\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit4\_relu3[0][0]']

1024)

add\_59 (Add) (None, None, None, 0 ['stage3\_unit4\_conv3[0][0]',

1024) 'add\_58[0][0]']

stage3\_unit5\_bn1 (BatchNormali (None, None, None, 4096 ['add\_59[0][0]']

zation) 1024)

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

) 1024)

stage3\_unit5\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit5\_relu1[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\_82 (ZeroPadding (None, None, None, 0 ['stage3\_unit5\_relu2[0][0]']

2D) 256)

stage3\_unit5\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_82[0][0]']

256)

stage3\_unit5\_bn3 (BatchNormali (None, None, None, 1024 ['stage3\_unit5\_conv2[0][0]']

zation) 256)

stage3\_unit5\_relu3 (Activation (None, None, None, 0 ['stage3\_unit5\_bn3[0][0]']

) 256)

stage3\_unit5\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit5\_relu3[0][0]']

1024)

add\_60 (Add) (None, None, None, 0 ['stage3\_unit5\_conv3[0][0]',

1024) 'add\_59[0][0]']

stage3\_unit6\_bn1 (BatchNormali (None, None, None, 4096 ['add\_60[0][0]']

zation) 1024)

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

) 1024)

stage3\_unit6\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit6\_relu1[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\_83 (ZeroPadding (None, None, None, 0 ['stage3\_unit6\_relu2[0][0]']

2D) 256)

stage3\_unit6\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_83[0][0]']

256)

stage3\_unit6\_bn3 (BatchNormali (None, None, None, 1024 ['stage3\_unit6\_conv2[0][0]']

zation) 256)

stage3\_unit6\_relu3 (Activation (None, None, None, 0 ['stage3\_unit6\_bn3[0][0]']

) 256)

stage3\_unit6\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit6\_relu3[0][0]']

1024)

add\_61 (Add) (None, None, None, 0 ['stage3\_unit6\_conv3[0][0]',

1024) 'add\_60[0][0]']

stage3\_unit7\_bn1 (BatchNormali (None, None, None, 4096 ['add\_61[0][0]']

zation) 1024)

stage3\_unit7\_relu1 (Activation (None, None, None, 0 ['stage3\_unit7\_bn1[0][0]']

) 1024)

stage3\_unit7\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit7\_relu1[0][0]']

256)

stage3\_unit7\_bn2 (BatchNormali (None, None, None, 1024 ['stage3\_unit7\_conv1[0][0]']

zation) 256)

stage3\_unit7\_relu2 (Activation (None, None, None, 0 ['stage3\_unit7\_bn2[0][0]']

) 256)

zero\_padding2d\_84 (ZeroPadding (None, None, None, 0 ['stage3\_unit7\_relu2[0][0]']

2D) 256)

stage3\_unit7\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_84[0][0]']

256)

stage3\_unit7\_bn3 (BatchNormali (None, None, None, 1024 ['stage3\_unit7\_conv2[0][0]']

zation) 256)

stage3\_unit7\_relu3 (Activation (None, None, None, 0 ['stage3\_unit7\_bn3[0][0]']

) 256)

stage3\_unit7\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit7\_relu3[0][0]']

1024)

add\_62 (Add) (None, None, None, 0 ['stage3\_unit7\_conv3[0][0]',

1024) 'add\_61[0][0]']

stage3\_unit8\_bn1 (BatchNormali (None, None, None, 4096 ['add\_62[0][0]']

zation) 1024)

stage3\_unit8\_relu1 (Activation (None, None, None, 0 ['stage3\_unit8\_bn1[0][0]']

) 1024)

stage3\_unit8\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit8\_relu1[0][0]']

256)

stage3\_unit8\_bn2 (BatchNormali (None, None, None, 1024 ['stage3\_unit8\_conv1[0][0]']

zation) 256)

stage3\_unit8\_relu2 (Activation (None, None, None, 0 ['stage3\_unit8\_bn2[0][0]']

) 256)

zero\_padding2d\_85 (ZeroPadding (None, None, None, 0 ['stage3\_unit8\_relu2[0][0]']

2D) 256)

stage3\_unit8\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_85[0][0]']

256)

stage3\_unit8\_bn3 (BatchNormali (None, None, None, 1024 ['stage3\_unit8\_conv2[0][0]']

zation) 256)

stage3\_unit8\_relu3 (Activation (None, None, None, 0 ['stage3\_unit8\_bn3[0][0]']

) 256)

stage3\_unit8\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit8\_relu3[0][0]']

1024)

add\_63 (Add) (None, None, None, 0 ['stage3\_unit8\_conv3[0][0]',

1024) 'add\_62[0][0]']

stage3\_unit9\_bn1 (BatchNormali (None, None, None, 4096 ['add\_63[0][0]']

zation) 1024)

stage3\_unit9\_relu1 (Activation (None, None, None, 0 ['stage3\_unit9\_bn1[0][0]']

) 1024)

stage3\_unit9\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit9\_relu1[0][0]']

256)

stage3\_unit9\_bn2 (BatchNormali (None, None, None, 1024 ['stage3\_unit9\_conv1[0][0]']

zation) 256)

stage3\_unit9\_relu2 (Activation (None, None, None, 0 ['stage3\_unit9\_bn2[0][0]']

) 256)

zero\_padding2d\_86 (ZeroPadding (None, None, None, 0 ['stage3\_unit9\_relu2[0][0]']

2D) 256)

stage3\_unit9\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_86[0][0]']

256)

stage3\_unit9\_bn3 (BatchNormali (None, None, None, 1024 ['stage3\_unit9\_conv2[0][0]']

zation) 256)

stage3\_unit9\_relu3 (Activation (None, None, None, 0 ['stage3\_unit9\_bn3[0][0]']

) 256)

stage3\_unit9\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit9\_relu3[0][0]']

1024)

add\_64 (Add) (None, None, None, 0 ['stage3\_unit9\_conv3[0][0]',

1024) 'add\_63[0][0]']

stage3\_unit10\_bn1 (BatchNormal (None, None, None, 4096 ['add\_64[0][0]']

ization) 1024)

stage3\_unit10\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit10\_bn1[0][0]']

n) 1024)

stage3\_unit10\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit10\_relu1[0][0]']

256)

stage3\_unit10\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit10\_conv1[0][0]']

ization) 256)

stage3\_unit10\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit10\_bn2[0][0]']

n) 256)

zero\_padding2d\_87 (ZeroPadding (None, None, None, 0 ['stage3\_unit10\_relu2[0][0]']

2D) 256)

stage3\_unit10\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_87[0][0]']

256)

stage3\_unit10\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit10\_conv2[0][0]']

ization) 256)

stage3\_unit10\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit10\_bn3[0][0]']

n) 256)

stage3\_unit10\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit10\_relu3[0][0]']

1024)

add\_65 (Add) (None, None, None, 0 ['stage3\_unit10\_conv3[0][0]',

1024) 'add\_64[0][0]']

stage3\_unit11\_bn1 (BatchNormal (None, None, None, 4096 ['add\_65[0][0]']

ization) 1024)

stage3\_unit11\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit11\_bn1[0][0]']

n) 1024)

stage3\_unit11\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit11\_relu1[0][0]']

256)

stage3\_unit11\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit11\_conv1[0][0]']

ization) 256)

stage3\_unit11\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit11\_bn2[0][0]']

n) 256)

zero\_padding2d\_88 (ZeroPadding (None, None, None, 0 ['stage3\_unit11\_relu2[0][0]']

2D) 256)

stage3\_unit11\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_88[0][0]']

256)

stage3\_unit11\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit11\_conv2[0][0]']

ization) 256)

stage3\_unit11\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit11\_bn3[0][0]']

n) 256)

stage3\_unit11\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit11\_relu3[0][0]']

1024)

add\_66 (Add) (None, None, None, 0 ['stage3\_unit11\_conv3[0][0]',

1024) 'add\_65[0][0]']

stage3\_unit12\_bn1 (BatchNormal (None, None, None, 4096 ['add\_66[0][0]']

ization) 1024)

stage3\_unit12\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit12\_bn1[0][0]']

n) 1024)

stage3\_unit12\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit12\_relu1[0][0]']

256)

stage3\_unit12\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit12\_conv1[0][0]']

ization) 256)

stage3\_unit12\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit12\_bn2[0][0]']

n) 256)

zero\_padding2d\_89 (ZeroPadding (None, None, None, 0 ['stage3\_unit12\_relu2[0][0]']

2D) 256)

stage3\_unit12\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_89[0][0]']

256)

stage3\_unit12\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit12\_conv2[0][0]']

ization) 256)

stage3\_unit12\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit12\_bn3[0][0]']

n) 256)

stage3\_unit12\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit12\_relu3[0][0]']

1024)

add\_67 (Add) (None, None, None, 0 ['stage3\_unit12\_conv3[0][0]',

1024) 'add\_66[0][0]']

stage3\_unit13\_bn1 (BatchNormal (None, None, None, 4096 ['add\_67[0][0]']

ization) 1024)

stage3\_unit13\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit13\_bn1[0][0]']

n) 1024)

stage3\_unit13\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit13\_relu1[0][0]']

256)

stage3\_unit13\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit13\_conv1[0][0]']

ization) 256)

stage3\_unit13\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit13\_bn2[0][0]']

n) 256)

zero\_padding2d\_90 (ZeroPadding (None, None, None, 0 ['stage3\_unit13\_relu2[0][0]']

2D) 256)

stage3\_unit13\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_90[0][0]']

256)

stage3\_unit13\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit13\_conv2[0][0]']

ization) 256)

stage3\_unit13\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit13\_bn3[0][0]']

n) 256)

stage3\_unit13\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit13\_relu3[0][0]']

1024)

add\_68 (Add) (None, None, None, 0 ['stage3\_unit13\_conv3[0][0]',

1024) 'add\_67[0][0]']

stage3\_unit14\_bn1 (BatchNormal (None, None, None, 4096 ['add\_68[0][0]']

ization) 1024)

stage3\_unit14\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit14\_bn1[0][0]']

n) 1024)

stage3\_unit14\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit14\_relu1[0][0]']

256)

stage3\_unit14\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit14\_conv1[0][0]']

ization) 256)

stage3\_unit14\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit14\_bn2[0][0]']

n) 256)

zero\_padding2d\_91 (ZeroPadding (None, None, None, 0 ['stage3\_unit14\_relu2[0][0]']

2D) 256)

stage3\_unit14\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_91[0][0]']

256)

stage3\_unit14\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit14\_conv2[0][0]']

ization) 256)

stage3\_unit14\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit14\_bn3[0][0]']

n) 256)

stage3\_unit14\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit14\_relu3[0][0]']

1024)

add\_69 (Add) (None, None, None, 0 ['stage3\_unit14\_conv3[0][0]',

1024) 'add\_68[0][0]']

stage3\_unit15\_bn1 (BatchNormal (None, None, None, 4096 ['add\_69[0][0]']

ization) 1024)

stage3\_unit15\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit15\_bn1[0][0]']

n) 1024)

stage3\_unit15\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit15\_relu1[0][0]']

256)

stage3\_unit15\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit15\_conv1[0][0]']

ization) 256)

stage3\_unit15\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit15\_bn2[0][0]']

n) 256)

zero\_padding2d\_92 (ZeroPadding (None, None, None, 0 ['stage3\_unit15\_relu2[0][0]']

2D) 256)

stage3\_unit15\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_92[0][0]']

256)

stage3\_unit15\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit15\_conv2[0][0]']

ization) 256)

stage3\_unit15\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit15\_bn3[0][0]']

n) 256)

stage3\_unit15\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit15\_relu3[0][0]']

1024)

add\_70 (Add) (None, None, None, 0 ['stage3\_unit15\_conv3[0][0]',

1024) 'add\_69[0][0]']

stage3\_unit16\_bn1 (BatchNormal (None, None, None, 4096 ['add\_70[0][0]']

ization) 1024)

stage3\_unit16\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit16\_bn1[0][0]']

n) 1024)

stage3\_unit16\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit16\_relu1[0][0]']

256)

stage3\_unit16\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit16\_conv1[0][0]']

ization) 256)

stage3\_unit16\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit16\_bn2[0][0]']

n) 256)

zero\_padding2d\_93 (ZeroPadding (None, None, None, 0 ['stage3\_unit16\_relu2[0][0]']

2D) 256)

stage3\_unit16\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_93[0][0]']

256)

stage3\_unit16\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit16\_conv2[0][0]']

ization) 256)

stage3\_unit16\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit16\_bn3[0][0]']

n) 256)

stage3\_unit16\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit16\_relu3[0][0]']

1024)

add\_71 (Add) (None, None, None, 0 ['stage3\_unit16\_conv3[0][0]',

1024) 'add\_70[0][0]']

stage3\_unit17\_bn1 (BatchNormal (None, None, None, 4096 ['add\_71[0][0]']

ization) 1024)

stage3\_unit17\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit17\_bn1[0][0]']

n) 1024)

stage3\_unit17\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit17\_relu1[0][0]']

256)

stage3\_unit17\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit17\_conv1[0][0]']

ization) 256)

stage3\_unit17\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit17\_bn2[0][0]']

n) 256)

zero\_padding2d\_94 (ZeroPadding (None, None, None, 0 ['stage3\_unit17\_relu2[0][0]']

2D) 256)

stage3\_unit17\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_94[0][0]']

256)

stage3\_unit17\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit17\_conv2[0][0]']

ization) 256)

stage3\_unit17\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit17\_bn3[0][0]']

n) 256)

stage3\_unit17\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit17\_relu3[0][0]']

1024)

add\_72 (Add) (None, None, None, 0 ['stage3\_unit17\_conv3[0][0]',

1024) 'add\_71[0][0]']

stage3\_unit18\_bn1 (BatchNormal (None, None, None, 4096 ['add\_72[0][0]']

ization) 1024)

stage3\_unit18\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit18\_bn1[0][0]']

n) 1024)

stage3\_unit18\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit18\_relu1[0][0]']

256)

stage3\_unit18\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit18\_conv1[0][0]']

ization) 256)

stage3\_unit18\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit18\_bn2[0][0]']

n) 256)

zero\_padding2d\_95 (ZeroPadding (None, None, None, 0 ['stage3\_unit18\_relu2[0][0]']

2D) 256)

stage3\_unit18\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_95[0][0]']

256)

stage3\_unit18\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit18\_conv2[0][0]']

ization) 256)

stage3\_unit18\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit18\_bn3[0][0]']

n) 256)

stage3\_unit18\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit18\_relu3[0][0]']

1024)

add\_73 (Add) (None, None, None, 0 ['stage3\_unit18\_conv3[0][0]',

1024) 'add\_72[0][0]']

stage3\_unit19\_bn1 (BatchNormal (None, None, None, 4096 ['add\_73[0][0]']

ization) 1024)

stage3\_unit19\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit19\_bn1[0][0]']

n) 1024)

stage3\_unit19\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit19\_relu1[0][0]']

256)

stage3\_unit19\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit19\_conv1[0][0]']

ization) 256)

stage3\_unit19\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit19\_bn2[0][0]']

n) 256)

zero\_padding2d\_96 (ZeroPadding (None, None, None, 0 ['stage3\_unit19\_relu2[0][0]']

2D) 256)

stage3\_unit19\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_96[0][0]']

256)

stage3\_unit19\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit19\_conv2[0][0]']

ization) 256)

stage3\_unit19\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit19\_bn3[0][0]']

n) 256)

stage3\_unit19\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit19\_relu3[0][0]']

1024)

add\_74 (Add) (None, None, None, 0 ['stage3\_unit19\_conv3[0][0]',

1024) 'add\_73[0][0]']

stage3\_unit20\_bn1 (BatchNormal (None, None, None, 4096 ['add\_74[0][0]']

ization) 1024)

stage3\_unit20\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit20\_bn1[0][0]']

n) 1024)

stage3\_unit20\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit20\_relu1[0][0]']

256)

stage3\_unit20\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit20\_conv1[0][0]']

ization) 256)

stage3\_unit20\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit20\_bn2[0][0]']

n) 256)

zero\_padding2d\_97 (ZeroPadding (None, None, None, 0 ['stage3\_unit20\_relu2[0][0]']

2D) 256)

stage3\_unit20\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_97[0][0]']

256)

stage3\_unit20\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit20\_conv2[0][0]']

ization) 256)

stage3\_unit20\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit20\_bn3[0][0]']

n) 256)

stage3\_unit20\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit20\_relu3[0][0]']

1024)

add\_75 (Add) (None, None, None, 0 ['stage3\_unit20\_conv3[0][0]',

1024) 'add\_74[0][0]']

stage3\_unit21\_bn1 (BatchNormal (None, None, None, 4096 ['add\_75[0][0]']

ization) 1024)

stage3\_unit21\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit21\_bn1[0][0]']

n) 1024)

stage3\_unit21\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit21\_relu1[0][0]']

256)

stage3\_unit21\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit21\_conv1[0][0]']

ization) 256)

stage3\_unit21\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit21\_bn2[0][0]']

n) 256)

zero\_padding2d\_98 (ZeroPadding (None, None, None, 0 ['stage3\_unit21\_relu2[0][0]']

2D) 256)

stage3\_unit21\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_98[0][0]']

256)

stage3\_unit21\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit21\_conv2[0][0]']

ization) 256)

stage3\_unit21\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit21\_bn3[0][0]']

n) 256)

stage3\_unit21\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit21\_relu3[0][0]']

1024)

add\_76 (Add) (None, None, None, 0 ['stage3\_unit21\_conv3[0][0]',

1024) 'add\_75[0][0]']

stage3\_unit22\_bn1 (BatchNormal (None, None, None, 4096 ['add\_76[0][0]']

ization) 1024)

stage3\_unit22\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit22\_bn1[0][0]']

n) 1024)

stage3\_unit22\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit22\_relu1[0][0]']

256)

stage3\_unit22\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit22\_conv1[0][0]']

ization) 256)

stage3\_unit22\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit22\_bn2[0][0]']

n) 256)

zero\_padding2d\_99 (ZeroPadding (None, None, None, 0 ['stage3\_unit22\_relu2[0][0]']

2D) 256)

stage3\_unit22\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_99[0][0]']

256)

stage3\_unit22\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit22\_conv2[0][0]']

ization) 256)

stage3\_unit22\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit22\_bn3[0][0]']

n) 256)

stage3\_unit22\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit22\_relu3[0][0]']

1024)

add\_77 (Add) (None, None, None, 0 ['stage3\_unit22\_conv3[0][0]',

1024) 'add\_76[0][0]']

stage3\_unit23\_bn1 (BatchNormal (None, None, None, 4096 ['add\_77[0][0]']

ization) 1024)

stage3\_unit23\_relu1 (Activatio (None, None, None, 0 ['stage3\_unit23\_bn1[0][0]']

n) 1024)

stage3\_unit23\_conv1 (Conv2D) (None, None, None, 262144 ['stage3\_unit23\_relu1[0][0]']

256)

stage3\_unit23\_bn2 (BatchNormal (None, None, None, 1024 ['stage3\_unit23\_conv1[0][0]']

ization) 256)

stage3\_unit23\_relu2 (Activatio (None, None, None, 0 ['stage3\_unit23\_bn2[0][0]']

n) 256)

zero\_padding2d\_100 (ZeroPaddin (None, None, None, 0 ['stage3\_unit23\_relu2[0][0]']

g2D) 256)

stage3\_unit23\_conv2 (Conv2D) (None, None, None, 589824 ['zero\_padding2d\_100[0][0]']

256)

stage3\_unit23\_bn3 (BatchNormal (None, None, None, 1024 ['stage3\_unit23\_conv2[0][0]']

ization) 256)

stage3\_unit23\_relu3 (Activatio (None, None, None, 0 ['stage3\_unit23\_bn3[0][0]']

n) 256)

stage3\_unit23\_conv3 (Conv2D) (None, None, None, 262144 ['stage3\_unit23\_relu3[0][0]']

1024)

add\_78 (Add) (None, None, None, 0 ['stage3\_unit23\_conv3[0][0]',

1024) 'add\_77[0][0]']

stage4\_unit1\_bn1 (BatchNormali (None, None, None, 4096 ['add\_78[0][0]']

zation) 1024)

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

) 1024)

stage4\_unit1\_conv1 (Conv2D) (None, None, None, 524288 ['stage4\_unit1\_relu1[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\_101 (ZeroPaddin (None, None, None, 0 ['stage4\_unit1\_relu2[0][0]']

g2D) 512)

stage4\_unit1\_conv2 (Conv2D) (None, None, None, 2359296 ['zero\_padding2d\_101[0][0]']

512)

stage4\_unit1\_bn3 (BatchNormali (None, None, None, 2048 ['stage4\_unit1\_conv2[0][0]']

zation) 512)

stage4\_unit1\_relu3 (Activation (None, None, None, 0 ['stage4\_unit1\_bn3[0][0]']

) 512)

stage4\_unit1\_conv3 (Conv2D) (None, None, None, 1048576 ['stage4\_unit1\_relu3[0][0]']

2048)

stage4\_unit1\_sc (Conv2D) (None, None, None, 2097152 ['stage4\_unit1\_relu1[0][0]']

2048)

add\_79 (Add) (None, None, None, 0 ['stage4\_unit1\_conv3[0][0]',

2048) 'stage4\_unit1\_sc[0][0]']

stage4\_unit2\_bn1 (BatchNormali (None, None, None, 8192 ['add\_79[0][0]']

zation) 2048)

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

) 2048)

stage4\_unit2\_conv1 (Conv2D) (None, None, None, 1048576 ['stage4\_unit2\_relu1[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\_102 (ZeroPaddin (None, None, None, 0 ['stage4\_unit2\_relu2[0][0]']

g2D) 512)

stage4\_unit2\_conv2 (Conv2D) (None, None, None, 2359296 ['zero\_padding2d\_102[0][0]']

512)

stage4\_unit2\_bn3 (BatchNormali (None, None, None, 2048 ['stage4\_unit2\_conv2[0][0]']

zation) 512)

stage4\_unit2\_relu3 (Activation (None, None, None, 0 ['stage4\_unit2\_bn3[0][0]']

) 512)

stage4\_unit2\_conv3 (Conv2D) (None, None, None, 1048576 ['stage4\_unit2\_relu3[0][0]']

2048)

add\_80 (Add) (None, None, None, 0 ['stage4\_unit2\_conv3[0][0]',

2048) 'add\_79[0][0]']

stage4\_unit3\_bn1 (BatchNormali (None, None, None, 8192 ['add\_80[0][0]']

zation) 2048)

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

) 2048)

stage4\_unit3\_conv1 (Conv2D) (None, None, None, 1048576 ['stage4\_unit3\_relu1[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\_103 (ZeroPaddin (None, None, None, 0 ['stage4\_unit3\_relu2[0][0]']

g2D) 512)

stage4\_unit3\_conv2 (Conv2D) (None, None, None, 2359296 ['zero\_padding2d\_103[0][0]']

512)

stage4\_unit3\_bn3 (BatchNormali (None, None, None, 2048 ['stage4\_unit3\_conv2[0][0]']

zation) 512)

stage4\_unit3\_relu3 (Activation (None, None, None, 0 ['stage4\_unit3\_bn3[0][0]']

) 512)

stage4\_unit3\_conv3 (Conv2D) (None, None, None, 1048576 ['stage4\_unit3\_relu3[0][0]']

2048)

add\_81 (Add) (None, None, None, 0 ['stage4\_unit3\_conv3[0][0]',

2048) 'add\_80[0][0]']

bn1 (BatchNormalization) (None, None, None, 8192 ['add\_81[0][0]']

2048)

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

2048)

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

ampling2D) 2048)

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

nate) 3072) ',

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

decoder\_stage0a\_conv (Conv2D) (None, None, None, 7077888 ['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) 768) ',

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

decoder\_stage1a\_conv (Conv2D) (None, None, None, 884736 ['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) 384) ',

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

decoder\_stage2a\_conv (Conv2D) (None, None, None, 221184 ['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)

sigmoid (Activation) (None, None, None, 0 ['final\_conv[0][0]']

1)

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

Total params: 51,605,466

Trainable params: 51,505,684

Non-trainable params: 99,782

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None