

## 10: Model Summary

Model: "model"

Layer (type)	Output Shape	Param #	Connected to
=====			
input_1 (InputLayer)	[(None, 224, 224, 3)]	0	
conv1_pad (ZeroPadding2D)	(None, 230, 230, 3)	0	input_1[0][0]
conv1_conv (Conv2D)	(None, 112, 112, 64)	9472	conv1_pad[0][0]
conv1_bn (BatchNormalization)	(None, 112, 112, 64)	256	conv1_conv[0][0]
conv1_relu (Activation)	(None, 112, 112, 64)	0	conv1_bn[0][0]
pool1_pad (ZeroPadding2D)	(None, 114, 114, 64)	0	conv1_relu[0][0]
pool1_pool (MaxPooling2D)	(None, 56, 56, 64)	0	pool1_pad[0][0]
conv2_block1_1_conv (Conv2D)	(None, 56, 56, 64)	4160	pool1_pool[0][0]
conv2_block1_1_bn (BatchNormalization)	(None, 56, 56, 64)	256	conv2_block1_1_conv[0][0]
conv2_block1_1_relu (Activation)	(None, 56, 56, 64)	0	conv2_block1_1_bn[0][0]
conv2_block1_2_conv (Conv2D)	(None, 56, 56, 64)	36928	conv2_block1_1_relu[0][0]

---

conv2_block1_2_bn (BatchNormali	(None, 56, 56, 64)	256	
conv2_block1_2_conv[0][0]			

---

conv2_block1_2_relu (Activation	(None, 56, 56, 64)	0	
conv2_block1_2_bn[0][0]			

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conv2_block1_0_conv (Conv2D)	(None, 56, 56, 256)	16640	pool1_pool[0][0]
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conv2_block1_3_conv (Conv2D)	(None, 56, 56, 256)	16640	
conv2_block1_2_relu[0][0]			

---

conv2_block1_0_bn (BatchNormali	(None, 56, 56, 256)	1024	
conv2_block1_0_conv[0][0]			

---

conv2_block1_3_bn (BatchNormali	(None, 56, 56, 256)	1024	
conv2_block1_3_conv[0][0]			

---

conv2_block1_add (Add)	(None, 56, 56, 256)	0	
conv2_block1_0_bn[0][0]			

---

conv2\_block1\_3\_bn[0][0]

---

conv2_block1_out (Activation)	(None, 56, 56, 256)	0	
conv2_block1_add[0][0]			

---

conv2_block2_1_conv (Conv2D)	(None, 56, 56, 64)	16448	
conv2_block1_out[0][0]			

---

conv2_block2_1_bn (BatchNormali	(None, 56, 56, 64)	256	
conv2_block2_1_conv[0][0]			

---

conv2_block2_1_relu (Activation	(None, 56, 56, 64)	0	
conv2_block2_1_bn[0][0]			

---

conv2_block2_2_conv (Conv2D)	(None, 56, 56, 64)	36928	
conv2_block2_1_relu[0][0]			

---

conv2_block2_2_bn (BatchNormali	(None, 56, 56, 64)	256
conv2_block2_2_conv[0][0]		

---

conv2_block2_2_relu (Activation	(None, 56, 56, 64)	0
conv2_block2_2_bn[0][0]		

---

conv2_block2_3_conv (Conv2D)	(None, 56, 56, 256)	16640
conv2_block2_2_relu[0][0]		

---

conv2_block2_3_bn (BatchNormali	(None, 56, 56, 256)	1024
conv2_block2_3_conv[0][0]		

---

conv2_block2_add (Add)	(None, 56, 56, 256)	0
conv2_block1_out[0][0]		

---

conv2\_block2\_3\_bn[0][0]

---

conv2_block2_out (Activation)	(None, 56, 56, 256)	0
conv2_block2_add[0][0]		

---

conv2_block3_1_conv (Conv2D)	(None, 56, 56, 64)	16448
conv2_block2_out[0][0]		

---

conv2_block3_1_bn (BatchNormali	(None, 56, 56, 64)	256
conv2_block3_1_conv[0][0]		

---

conv2_block3_1_relu (Activation	(None, 56, 56, 64)	0
conv2_block3_1_bn[0][0]		

---

conv2_block3_2_conv (Conv2D)	(None, 56, 56, 64)	36928
conv2_block3_1_relu[0][0]		

---

conv2_block3_2_bn (BatchNormali	(None, 56, 56, 64)	256
conv2_block3_2_conv[0][0]		

---

conv2_block3_2_relu (Activation	(None, 56, 56, 64)	0
conv2_block3_2_bn[0][0]		

---

conv2_block3_3_conv (Conv2D)	(None, 56, 56, 256)	16640
conv2_block3_2_relu[0][0]		

---

conv2_block3_3_bn (BatchNormali	(None, 56, 56, 256)	1024
conv2_block3_3_conv[0][0]		

---

conv2_block3_add (Add)	(None, 56, 56, 256)	0
conv2_block2_out[0][0]		

conv2\_block3\_3\_bn[0][0]

---

conv2_block3_out (Activation)	(None, 56, 56, 256)	0
conv2_block3_add[0][0]		

---

conv3_block1_1_conv (Conv2D)	(None, 28, 28, 128)	32896
conv2_block3_out[0][0]		

---

conv3_block1_1_bn (BatchNormali	(None, 28, 28, 128)	512
conv3_block1_1_conv[0][0]		

---

conv3_block1_1_relu (Activation	(None, 28, 28, 128)	0
conv3_block1_1_bn[0][0]		

---

conv3_block1_2_conv (Conv2D)	(None, 28, 28, 128)	147584
conv3_block1_1_relu[0][0]		

---

conv3_block1_2_bn (BatchNormali	(None, 28, 28, 128)	512
conv3_block1_2_conv[0][0]		

---

conv3_block1_2_relu (Activation	(None, 28, 28, 128)	0
conv3_block1_2_bn[0][0]		

---

conv3_block1_0_conv (Conv2D)	(None, 28, 28, 512)	131584
conv2_block3_out[0][0]		

---

conv3_block1_3_conv (Conv2D)	(None, 28, 28, 512)	66048
conv3_block1_2_relu[0][0]		

---

conv3\_block1\_0\_bn (BatchNormali (None, 28, 28, 512) 2048  
conv3\_block1\_0\_conv[0][0]

---

conv3\_block1\_3\_bn (BatchNormali (None, 28, 28, 512) 2048  
conv3\_block1\_3\_conv[0][0]

---

conv3\_block1\_add (Add) (None, 28, 28, 512) 0  
conv3\_block1\_0\_bn[0][0]

conv3\_block1\_3\_bn[0][0]

---

conv3\_block1\_out (Activation) (None, 28, 28, 512) 0  
conv3\_block1\_add[0][0]

---

conv3\_block2\_1\_conv (Conv2D) (None, 28, 28, 128) 65664  
conv3\_block1\_out[0][0]

---

conv3\_block2\_1\_bn (BatchNormali (None, 28, 28, 128) 512  
conv3\_block2\_1\_conv[0][0]

---

conv3\_block2\_1\_relu (Activation (None, 28, 28, 128) 0  
conv3\_block2\_1\_bn[0][0]

---

conv3\_block2\_2\_conv (Conv2D) (None, 28, 28, 128) 147584  
conv3\_block2\_1\_relu[0][0]

---

conv3\_block2\_2\_bn (BatchNormali (None, 28, 28, 128) 512  
conv3\_block2\_2\_conv[0][0]

---

conv3\_block2\_2\_relu (Activation (None, 28, 28, 128) 0  
conv3\_block2\_2\_bn[0][0]

---

conv3\_block2\_3\_conv (Conv2D) (None, 28, 28, 512) 66048  
conv3\_block2\_2\_relu[0][0]

---

conv3\_block2\_3\_bn (BatchNormali (None, 28, 28, 512) 2048  
conv3\_block2\_3\_conv[0][0]

---

conv3_block2_add (Add)	(None, 28, 28, 512)	0
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conv3\_block1\_out[0][0]

conv3\_block2\_3\_bn[0][0]

---

conv3_block2_out (Activation)	(None, 28, 28, 512)	0
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conv3\_block2\_add[0][0]

---

conv3_block3_1_conv (Conv2D)	(None, 28, 28, 128)	65664
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conv3\_block2\_out[0][0]

---

conv3_block3_1_bn (BatchNormali	(None, 28, 28, 128)	512
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conv3\_block3\_1\_conv[0][0]

---

conv3_block3_1_relu (Activation	(None, 28, 28, 128)	0
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conv3\_block3\_1\_bn[0][0]

---

conv3_block3_2_conv (Conv2D)	(None, 28, 28, 128)	147584
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conv3\_block3\_1\_relu[0][0]

---

conv3_block3_2_bn (BatchNormali	(None, 28, 28, 128)	512
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conv3\_block3\_2\_conv[0][0]

---

conv3_block3_2_relu (Activation	(None, 28, 28, 128)	0
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conv3\_block3\_2\_bn[0][0]

---

conv3_block3_3_conv (Conv2D)	(None, 28, 28, 512)	66048
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conv3\_block3\_2\_relu[0][0]

---

conv3_block3_3_bn (BatchNormali	(None, 28, 28, 512)	2048
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conv3\_block3\_3\_conv[0][0]

---

conv3_block3_add (Add)	(None, 28, 28, 512)	0
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conv3\_block2\_out[0][0]

conv3\_block3\_3\_bn[0][0]

---

conv3\_block3\_out (Activation) (None, 28, 28, 512) 0  
conv3\_block3\_add[0][0]

---

conv3\_block4\_1\_conv (Conv2D) (None, 28, 28, 128) 65664  
conv3\_block3\_out[0][0]

---

conv3\_block4\_1\_bn (BatchNormali (None, 28, 28, 128) 512  
conv3\_block4\_1\_conv[0][0]

---

conv3\_block4\_1\_relu (Activation (None, 28, 28, 128) 0  
conv3\_block4\_1\_bn[0][0]

---

conv3\_block4\_2\_conv (Conv2D) (None, 28, 28, 128) 147584  
conv3\_block4\_1\_relu[0][0]

---

conv3\_block4\_2\_bn (BatchNormali (None, 28, 28, 128) 512  
conv3\_block4\_2\_conv[0][0]

---

conv3\_block4\_2\_relu (Activation (None, 28, 28, 128) 0  
conv3\_block4\_2\_bn[0][0]

---

conv3\_block4\_3\_conv (Conv2D) (None, 28, 28, 512) 66048  
conv3\_block4\_2\_relu[0][0]

---

conv3\_block4\_3\_bn (BatchNormali (None, 28, 28, 512) 2048  
conv3\_block4\_3\_conv[0][0]

---

conv3\_block4\_add (Add) (None, 28, 28, 512) 0  
conv3\_block3\_out[0][0]

conv3\_block4\_3\_bn[0][0]

---

conv3\_block4\_out (Activation) (None, 28, 28, 512) 0  
conv3\_block4\_add[0][0]

---

conv4\_block1\_1\_conv (Conv2D) (None, 14, 14, 256) 131328  
conv3\_block4\_out[0][0]

---

conv4\_block1\_1\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block1\_1\_conv[0][0]

---

conv4\_block1\_1\_relu (Activation (None, 14, 14, 256) 0  
conv4\_block1\_1\_bn[0][0]

---

conv4\_block1\_2\_conv (Conv2D) (None, 14, 14, 256) 590080  
conv4\_block1\_1\_relu[0][0]

---

conv4\_block1\_2\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block1\_2\_conv[0][0]

---

conv4\_block1\_2\_relu (Activation (None, 14, 14, 256) 0  
conv4\_block1\_2\_bn[0][0]

---

conv4\_block1\_0\_conv (Conv2D) (None, 14, 14, 1024) 525312  
conv3\_block4\_out[0][0]

---

conv4\_block1\_3\_conv (Conv2D) (None, 14, 14, 1024) 263168  
conv4\_block1\_2\_relu[0][0]

---

conv4\_block1\_0\_bn (BatchNormali (None, 14, 14, 1024) 4096  
conv4\_block1\_0\_conv[0][0]

---

conv4\_block1\_3\_bn (BatchNormali (None, 14, 14, 1024) 4096  
conv4\_block1\_3\_conv[0][0]

---

conv4\_block1\_add (Add) (None, 14, 14, 1024) 0  
conv4\_block1\_0\_bn[0][0]

conv4\_block1\_3\_bn[0][0]

---

conv4\_block1\_out (Activation) (None, 14, 14, 1024) 0  
conv4\_block1\_add[0][0]

---

conv4\_block2\_1\_conv (Conv2D) (None, 14, 14, 256) 262400  
conv4\_block1\_out[0][0]

---



conv4\_block2\_1\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block2\_1\_conv[0][0]

---

conv4\_block2\_1\_relu (Activation (None, 14, 14, 256) 0  
conv4\_block2\_1\_bn[0][0]

---

conv4\_block2\_2\_conv (Conv2D) (None, 14, 14, 256) 590080  
conv4\_block2\_1\_relu[0][0]

---

conv4\_block2\_2\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block2\_2\_conv[0][0]

---

conv4\_block2\_2\_relu (Activation (None, 14, 14, 256) 0  
conv4\_block2\_2\_bn[0][0]

---

conv4\_block2\_3\_conv (Conv2D) (None, 14, 14, 1024) 263168  
conv4\_block2\_2\_relu[0][0]

---

conv4\_block2\_3\_bn (BatchNormali (None, 14, 14, 1024) 4096  
conv4\_block2\_3\_conv[0][0]

---

conv4\_block2\_add (Add) (None, 14, 14, 1024) 0  
conv4\_block1\_out[0][0]

---

conv4\_block2\_3\_bn[0][0]

---

conv4\_block2\_out (Activation) (None, 14, 14, 1024) 0  
conv4\_block2\_add[0][0]

---

conv4\_block3\_1\_conv (Conv2D) (None, 14, 14, 256) 262400  
conv4\_block2\_out[0][0]

---

conv4\_block3\_1\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block3\_1\_conv[0][0]

---

conv4\_block3\_1\_relu (Activation (None, 14, 14, 256) 0  
conv4\_block3\_1\_bn[0][0]

---

conv4\_block3\_2\_conv (Conv2D) (None, 14, 14, 256) 590080  
conv4\_block3\_1\_relu[0][0]

---

conv4\_block3\_2\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block3\_2\_conv[0][0]

---

conv4\_block3\_2\_relu (Activation (None, 14, 14, 256) 0  
conv4\_block3\_2\_bn[0][0]

---

conv4\_block3\_3\_conv (Conv2D) (None, 14, 14, 1024) 263168  
conv4\_block3\_2\_relu[0][0]

---

conv4\_block3\_3\_bn (BatchNormali (None, 14, 14, 1024) 4096  
conv4\_block3\_3\_conv[0][0]

---

conv4\_block3\_add (Add) (None, 14, 14, 1024) 0  
conv4\_block2\_out[0][0]

conv4\_block3\_3\_bn[0][0]

---

conv4\_block3\_out (Activation) (None, 14, 14, 1024) 0  
conv4\_block3\_add[0][0]

---

conv4\_block4\_1\_conv (Conv2D) (None, 14, 14, 256) 262400  
conv4\_block3\_out[0][0]

---

conv4\_block4\_1\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block4\_1\_conv[0][0]

---

conv4\_block4\_1\_relu (Activation (None, 14, 14, 256) 0  
conv4\_block4\_1\_bn[0][0]

---

conv4\_block4\_2\_conv (Conv2D) (None, 14, 14, 256) 590080  
conv4\_block4\_1\_relu[0][0]

---

conv4\_block4\_2\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block4\_2\_conv[0][0]

---

conv4\_block4\_2\_relu (Activation (None, 14, 14, 256)) 0  
conv4\_block4\_2\_bn[0][0]

---

conv4\_block4\_3\_conv (Conv2D) (None, 14, 14, 1024) 263168  
conv4\_block4\_2\_relu[0][0]

---

conv4\_block4\_3\_bn (BatchNormaliz (None, 14, 14, 1024) 4096  
conv4\_block4\_3\_conv[0][0]

---

conv4\_block4\_add (Add) (None, 14, 14, 1024) 0  
conv4\_block3\_out[0][0]

conv4\_block4\_3\_bn[0][0]

---

conv4\_block4\_out (Activation) (None, 14, 14, 1024) 0  
conv4\_block4\_add[0][0]

---

conv4\_block5\_1\_conv (Conv2D) (None, 14, 14, 256) 262400  
conv4\_block4\_out[0][0]

---

conv4\_block5\_1\_bn (BatchNormaliz (None, 14, 14, 256) 1024  
conv4\_block5\_1\_conv[0][0]

---

conv4\_block5\_1\_relu (Activation (None, 14, 14, 256)) 0  
conv4\_block5\_1\_bn[0][0]

---

conv4\_block5\_2\_conv (Conv2D) (None, 14, 14, 256) 590080  
conv4\_block5\_1\_relu[0][0]

---

conv4\_block5\_2\_bn (BatchNormaliz (None, 14, 14, 256) 1024  
conv4\_block5\_2\_conv[0][0]

---

conv4\_block5\_2\_relu (Activation (None, 14, 14, 256)) 0  
conv4\_block5\_2\_bn[0][0]

---

conv4\_block5\_3\_conv (Conv2D) (None, 14, 14, 1024) 263168  
conv4\_block5\_2\_relu[0][0]

---

conv4\_block5\_3\_bn (BatchNormali (None, 14, 14, 1024) 4096  
conv4\_block5\_3\_conv[0][0]

---

conv4\_block5\_add (Add) (None, 14, 14, 1024) 0  
conv4\_block4\_out[0][0]

---

conv4\_block5\_3\_bn[0][0]

---

conv4\_block5\_out (Activation) (None, 14, 14, 1024) 0  
conv4\_block5\_add[0][0]

---

conv4\_block6\_1\_conv (Conv2D) (None, 14, 14, 256) 262400  
conv4\_block5\_out[0][0]

---

conv4\_block6\_1\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block6\_1\_conv[0][0]

---

conv4\_block6\_1\_relu (Activation (None, 14, 14, 256) 0  
conv4\_block6\_1\_bn[0][0]

---

conv4\_block6\_2\_conv (Conv2D) (None, 14, 14, 256) 590080  
conv4\_block6\_1\_relu[0][0]

---

conv4\_block6\_2\_bn (BatchNormali (None, 14, 14, 256) 1024  
conv4\_block6\_2\_conv[0][0]

---

conv4\_block6\_2\_relu (Activation (None, 14, 14, 256) 0  
conv4\_block6\_2\_bn[0][0]

---

conv4\_block6\_3\_conv (Conv2D) (None, 14, 14, 1024) 263168  
conv4\_block6\_2\_relu[0][0]

---

conv4\_block6\_3\_bn (BatchNormali (None, 14, 14, 1024) 4096  
conv4\_block6\_3\_conv[0][0]

---

conv4\_block6\_add (Add) (None, 14, 14, 1024) 0  
conv4\_block5\_out[0][0]

---

conv4\_block6\_3\_bn[0][0]

---

conv4_block6_out (Activation)	(None, 14, 14, 1024)	0
conv4_block6_add[0][0]		

---

conv5_block1_1_conv (Conv2D)	(None, 7, 7, 512)	524800
conv4_block6_out[0][0]		

---

conv5_block1_1_bn (BatchNormali	(None, 7, 7, 512)	2048
conv5_block1_1_conv[0][0]		

---

conv5_block1_1_relu (Activation	(None, 7, 7, 512)	0
conv5_block1_1_bn[0][0]		

---

conv5_block1_2_conv (Conv2D)	(None, 7, 7, 512)	2359808
conv5_block1_1_relu[0][0]		

---

conv5_block1_2_bn (BatchNormali	(None, 7, 7, 512)	2048
conv5_block1_2_conv[0][0]		

---

conv5_block1_2_relu (Activation	(None, 7, 7, 512)	0
conv5_block1_2_bn[0][0]		

---

conv5_block1_0_conv (Conv2D)	(None, 7, 7, 2048)	2099200
conv4_block6_out[0][0]		

---

conv5_block1_3_conv (Conv2D)	(None, 7, 7, 2048)	1050624
conv5_block1_2_relu[0][0]		

---

conv5_block1_0_bn (BatchNormali	(None, 7, 7, 2048)	8192
conv5_block1_0_conv[0][0]		

---

conv5_block1_3_bn (BatchNormali	(None, 7, 7, 2048)	8192
conv5_block1_3_conv[0][0]		

---

conv5_block1_add (Add)	(None, 7, 7, 2048)	0
conv5_block1_0_bn[0][0]		

conv5\_block1\_3\_bn[0][0]

conv5_block1_out (Activation) conv5_block1_add[0][0]	(None, 7, 7, 2048)	0
conv5_block2_1_conv (Conv2D) conv5_block1_out[0][0]	(None, 7, 7, 512)	1049088
conv5_block2_1_bn (BatchNormali conv5_block2_1_conv[0][0]	(None, 7, 7, 512)	2048
conv5_block2_1_relu (Activation conv5_block2_1_bn[0][0]	(None, 7, 7, 512)	0
conv5_block2_2_conv (Conv2D) conv5_block2_1_relu[0][0]	(None, 7, 7, 512)	2359808
conv5_block2_2_bn (BatchNormali conv5_block2_2_conv[0][0]	(None, 7, 7, 512)	2048
conv5_block2_2_relu (Activation conv5_block2_2_bn[0][0]	(None, 7, 7, 512)	0
conv5_block2_3_conv (Conv2D) conv5_block2_2_relu[0][0]	(None, 7, 7, 2048)	1050624
conv5_block2_3_bn (BatchNormali conv5_block2_3_conv[0][0]	(None, 7, 7, 2048)	8192
conv5_block2_add (Add) conv5_block1_out[0][0]  conv5_block2_3_bn[0][0]	(None, 7, 7, 2048)	0
conv5_block2_out (Activation) conv5_block2_add[0][0]	(None, 7, 7, 2048)	0
conv5_block3_1_conv (Conv2D) conv5_block2_out[0][0]	(None, 7, 7, 512)	1049088

conv5_block3_1_bn (BatchNormali	(None, 7, 7, 512)	2048	
conv5_block3_1_conv[0][0]			
conv5_block3_1_relu (Activation	(None, 7, 7, 512)	0	
conv5_block3_1_bn[0][0]			
conv5_block3_2_conv (Conv2D)	(None, 7, 7, 512)	2359808	
conv5_block3_1_relu[0][0]			
conv5_block3_2_bn (BatchNormali	(None, 7, 7, 512)	2048	
conv5_block3_2_conv[0][0]			
conv5_block3_2_relu (Activation	(None, 7, 7, 512)	0	
conv5_block3_2_bn[0][0]			
conv5_block3_3_conv (Conv2D)	(None, 7, 7, 2048)	1050624	
conv5_block3_2_relu[0][0]			
conv5_block3_3_bn (BatchNormali	(None, 7, 7, 2048)	8192	
conv5_block3_3_conv[0][0]			
conv5_block3_add (Add)	(None, 7, 7, 2048)	0	
conv5_block2_out[0][0]			
conv5_block3_3_bn[0][0]			
conv5_block3_out (Activation)	(None, 7, 7, 2048)	0	
conv5_block3_add[0][0]			
flatten (Flatten)	(None, 100352)	0	
conv5_block3_out[0][0]			
dense (Dense)	(None, 256)	25690368	flatten[0][0]
dense_1 (Dense)	(None, 128)	32896	dense[0][0]

---

dense_2 (Dense)	(None, 3)	387	dense_1[0][0]
-----------------	-----------	-----	---------------

---

=====  
Total params: 49,311,363  
Trainable params: 25,723,651  
Non-trainable params: 23,587,712

### 13: Executing the Model

Epoch 1/5

94/94 [=====] - 245s 3s/step - loss: 14.2512 - accuracy: 0.6986 - val\_loss: 0.2349 - val\_accuracy: 0.9613

Epoch 2/5

94/94 [=====] - 146s 2s/step - loss: 0.1831 - accuracy: 0.9655 - val\_loss: 0.2298 - val\_accuracy: 0.9687

Epoch 3/5

94/94 [=====] - 145s 2s/step - loss: 0.1091 - accuracy: 0.9793 - val\_loss: 0.0701 - val\_accuracy: 0.9833

Epoch 4/5

94/94 [=====] - 145s 2s/step - loss: 0.0214 - accuracy: 0.9928 - val\_loss: 0.1178 - val\_accuracy: 0.9783

Epoch 5/5

94/94 [=====] - 145s 2s/step - loss: 1.3059 - accuracy: 0.9165 - val\_loss: 0.0845 - val\_accuracy: 0.9823

### 15: Confusion Matrix

```
[[975  1 24]
 [ 2 998  0]
 [ 26  0 974]]
```

#### Classification Report

	precision	recall	f1-score	support
aca	0.97	0.97	0.97	1000
n	1.00	1.00	1.00	1000
scc	0.98	0.97	0.97	1000
accuracy			0.98	3000
macro avg	0.98	0.98	0.98	3000
weighted avg	0.98	0.98	0.98	3000

### 16: Results

24/24 [=====] - 29s 1s/step - loss: 0.0845 - accuracy: 0.9823

test\_loss, test accuracy [0.08446120470762253, 0.9823333621025085]