

Layer (type)	Output Shape	Param #
conv2d_1 (Conv2D)	(None, 62, 62, 32)	896
max_pooling2d_1 (MaxPooling2D)	(None, 31, 31, 32)	0
flatten_1 (Flatten)	(None, 30752)	0
dense_1 (Dense)	(None, 128)	3936384
dense_2 (Dense)	(None, 1)	129
Total params: 3,937,409		
Trainable params: 3,937,409		
Non-trainable params: 0		

Epoch 1/20

517/516 [=====] - 89s 172ms/step - loss: 0.6559 - acc: 0.6333 - val\_loss: 0.5904 - val\_acc: 0.6929

Epoch 2/20

517/516 [=====] - 81s 156ms/step - loss: 0.5705 - acc: 0.7125 - val\_loss: 0.5218 - val\_acc: 0.7337

Epoch 3/20

517/516 [=====] - 84s 162ms/step - loss: 0.4660 - acc: 0.7966 - val\_loss: 0.3895 - val\_acc: 0.8619

Epoch 4/20

517/516 [=====] - 83s 161ms/step - loss: 0.3506 - acc: 0.8596 - val\_loss: 0.3126 - val\_acc: 0.8639

Epoch 5/20

517/516 [=====] - 81s 156ms/step - loss: 0.2867 - acc: 0.8905 - val\_loss: 0.2843 - val\_acc: 0.8966

Epoch 6/20

517/516 [=====] - 83s 160ms/step - loss: 0.2519 - acc: 0.9071 - val\_loss: 0.2422 - val\_acc: 0.9080

Epoch 7/20

517/516 [=====] - 83s 161ms/step - loss: 0.2335 - acc: 0.9150 - val\_loss: 0.2395 - val\_acc: 0.9133

Epoch 8/20

517/516 [=====] - 81s 156ms/step - loss: 0.2230 - acc: 0.9188 - val\_loss: 0.2226 - val\_acc: 0.9214

Epoch 9/20

517/516 [=====] - 81s 157ms/step - loss: 0.2141 - acc: 0.9242 - val\_loss: 0.2128 - val\_acc: 0.9260

Epoch 10/20

517/516 [=====] - 83s 161ms/step - loss: 0.2003 - acc: 0.9295 - val\_loss: 0.2148 - val\_acc: 0.9343

Epoch 11/20

517/516 [=====] - 81s 156ms/step - loss: 0.1912 - acc: 0.9362 - val\_loss: 0.2205 - val\_acc: 0.9349

Epoch 12/20

517/516 [=====] - 81s 157ms/step - loss: 0.1885 - acc: 0.9367 - val\_loss: 0.2332 - val\_acc: 0.9178

Epoch 13/20

517/516 [=====] - 83s 160ms/step - loss: 0.1899 - acc: 0.9351 - val\_loss: 0.1874 - val\_acc: 0.9325

Epoch 14/20

517/516 [=====] - 81s 156ms/step - loss: 0.1798 - acc: 0.9392 - val\_loss: 0.1876 - val\_acc: 0.9419

Epoch 15/20

517/516 [=====] - 81s 156ms/step - loss: 0.1817 - acc: 0.9386 - val\_loss: 0.1926 - val\_acc: 0.9383

Epoch 16/20

517/516 [=====] - 83s 160ms/step - loss: 0.1823 - acc: 0.9390 - val\_loss: 0.1689 - val\_acc: 0.9468

Epoch 17/20

517/516 [=====] - 81s 157ms/step - loss: 0.1771 - acc: 0.9418 - val\_loss: 0.1614 - val\_acc: 0.9507

Epoch 18/20

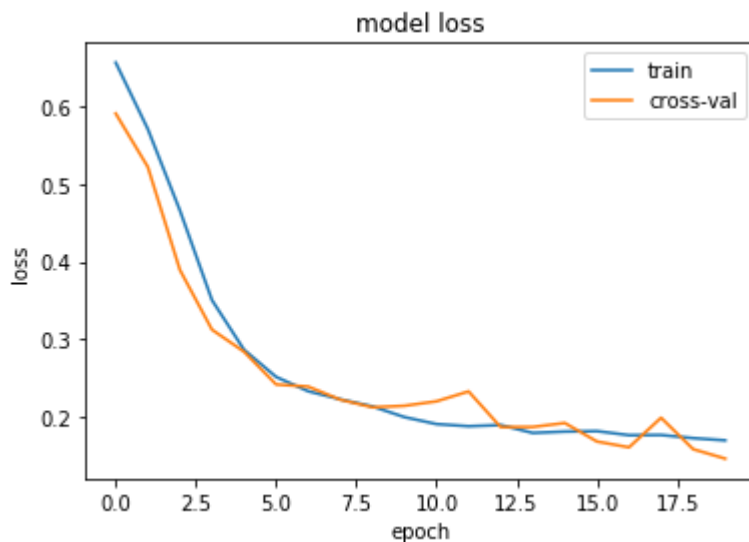
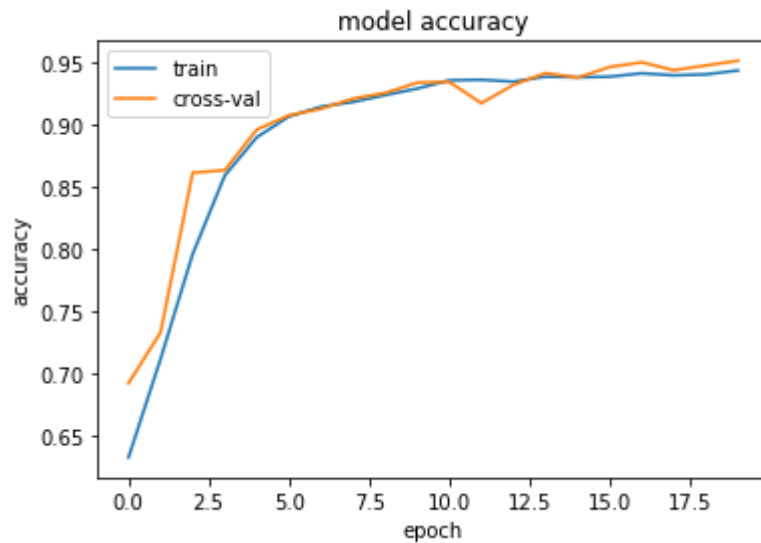
517/516 [=====] - 81s 156ms/step - loss: 0.1773 - acc: 0.9402 -  
val\_loss: 0.1994 - val\_acc: 0.9443

Epoch 19/20

517/516 [=====] - 83s 160ms/step - loss: 0.1731 - acc: 0.9410 -  
val\_loss: 0.1590 - val\_acc: 0.9481

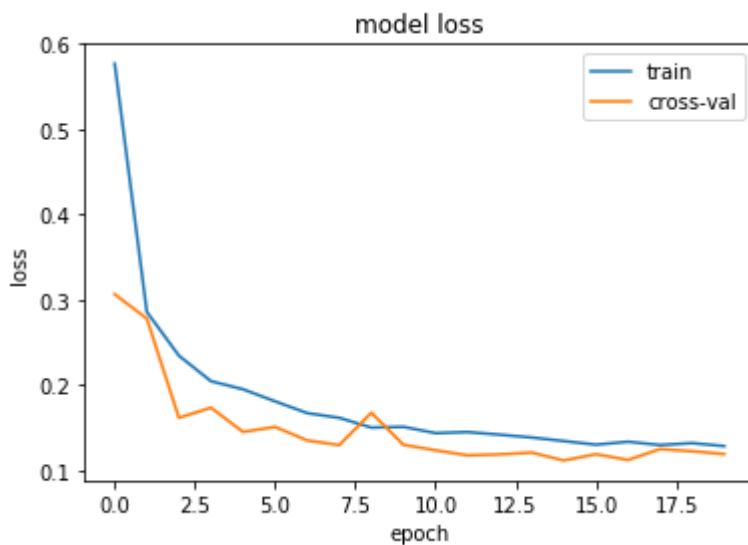
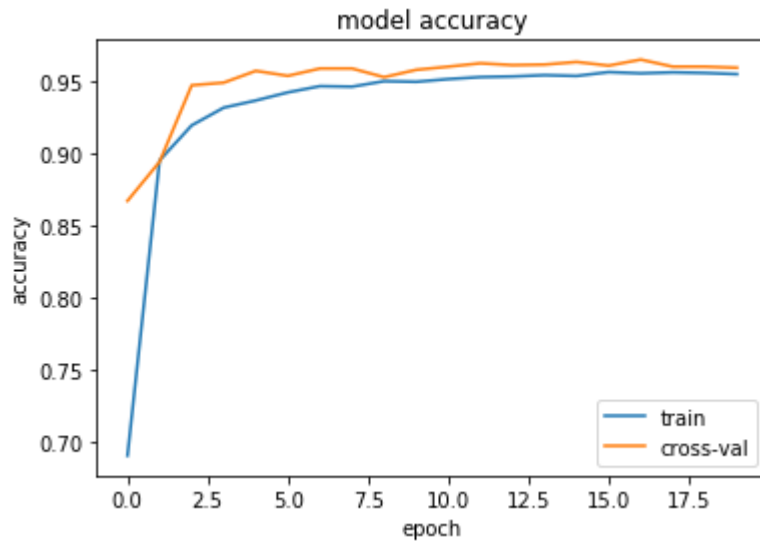
Epoch 20/20

517/516 [=====] - 83s 161ms/step - loss: 0.1703 - acc: 0.9441 -  
val\_loss: 0.1468 - val\_acc: 0.9519



Layer (type)	Output Shape	Param #
conv2d_2 (Conv2D)	(None, 62, 62, 32)	896
max_pooling2d_2 (MaxPooling2D)	(None, 31, 31, 32)	0
conv2d_3 (Conv2D)	(None, 29, 29, 32)	9248
max_pooling2d_3 (MaxPooling2D)	(None, 14, 14, 32)	0
flatten_2 (Flatten)	(None, 6272)	0
dense_3 (Dense)	(None, 128)	802944
dense_4 (Dense)	(None, 1)	129
Total params: 813,217		
Trainable params: 813,217		
Non-trainable params: 0		
Epoch 1/20		

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517/516 [=====] - 86s 166ms/step - loss: 0.5763 - acc: 0.6905 -  
val_loss: 0.3064 - val_acc: 0.8668  
Epoch 2/20  
517/516 [=====] - 86s 166ms/step - loss: 0.2859 - acc: 0.8948 -  
val_loss: 0.2780 - val_acc: 0.8939  
Epoch 3/20  
517/516 [=====] - 87s 168ms/step - loss: 0.2345 - acc: 0.9191 -  
val_loss: 0.1616 - val_acc: 0.9468  
Epoch 4/20  
517/516 [=====] - 86s 166ms/step - loss: 0.2045 - acc: 0.9314 -  
val_loss: 0.1736 - val_acc: 0.9487  
Epoch 5/20  
517/516 [=====] - 98s 189ms/step - loss: 0.1951 - acc: 0.9363 -  
val_loss: 0.1452 - val_acc: 0.9568  
Epoch 6/20  
517/516 [=====] - 93s 180ms/step - loss: 0.1810 - acc: 0.9419 -  
val_loss: 0.1510 - val_acc: 0.9534  
Epoch 7/20  
517/516 [=====] - 94s 181ms/step - loss: 0.1671 - acc: 0.9463 -  
val_loss: 0.1352 - val_acc: 0.9585  
Epoch 8/20  
517/516 [=====] - 92s 177ms/step - loss: 0.1617 - acc: 0.9458 -  
val_loss: 0.1297 - val_acc: 0.9585  
Epoch 9/20  
517/516 [=====] - 93s 181ms/step - loss: 0.1502 - acc: 0.9497 -  
val_loss: 0.1676 - val_acc: 0.9525  
Epoch 10/20  
517/516 [=====] - 92s 178ms/step - loss: 0.1510 - acc: 0.9493 -  
val_loss: 0.1300 - val_acc: 0.9575  
Epoch 11/20  
517/516 [=====] - 87s 169ms/step - loss: 0.1437 - acc: 0.9512 -  
val_loss: 0.1236 - val_acc: 0.9597  
Epoch 12/20  
517/516 [=====] - 86s 167ms/step - loss: 0.1450 - acc: 0.9525 -  
val_loss: 0.1177 - val_acc: 0.9621  
Epoch 13/20  
517/516 [=====] - 91s 176ms/step - loss: 0.1421 - acc: 0.9529 -  
val_loss: 0.1188 - val_acc: 0.9608  
Epoch 14/20  
517/516 [=====] - 91s 175ms/step - loss: 0.1385 - acc: 0.9539 -  
val_loss: 0.1209 - val_acc: 0.9612  
Epoch 15/20  
517/516 [=====] - 87s 169ms/step - loss: 0.1343 - acc: 0.9533 -  
val_loss: 0.1117 - val_acc: 0.9630  
Epoch 16/20  
517/516 [=====] - 87s 168ms/step - loss: 0.1303 - acc: 0.9559 -  
val_loss: 0.1190 - val_acc: 0.9604  
Epoch 17/20  
517/516 [=====] - 89s 173ms/step - loss: 0.1336 - acc: 0.9551 -  
val_loss: 0.1123 - val_acc: 0.9646  
Epoch 18/20  
517/516 [=====] - 87s 169ms/step - loss: 0.1298 - acc: 0.9558 -  
val_loss: 0.1250 - val_acc: 0.9597  
Epoch 19/20  
517/516 [=====] - 84s 163ms/step - loss: 0.1324 - acc: 0.9553 -  
val_loss: 0.1225 - val_acc: 0.9597  
Epoch 20/20  
517/516 [=====] - 88s 169ms/step - loss: 0.1285 - acc: 0.9546 -  
val_loss: 0.1192 - val_acc: 0.9590
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Layer (type)	Output Shape	Param #
conv2d_4 (Conv2D)	(None, 62, 62, 32)	896
max_pooling2d_4 (MaxPooling2D)	(None, 31, 31, 32)	0
conv2d_5 (Conv2D)	(None, 29, 29, 32)	9248
max_pooling2d_5 (MaxPooling2D)	(None, 14, 14, 32)	0
conv2d_6 (Conv2D)	(None, 12, 12, 32)	9248
max_pooling2d_6 (MaxPooling2D)	(None, 6, 6, 32)	0
flatten_3 (Flatten)	(None, 1152)	0
dense_5 (Dense)	(None, 128)	147584
dense_6 (Dense)	(None, 1)	129
Total params: 167,105		
Trainable params: 167,105		
Non-trainable params: 0		

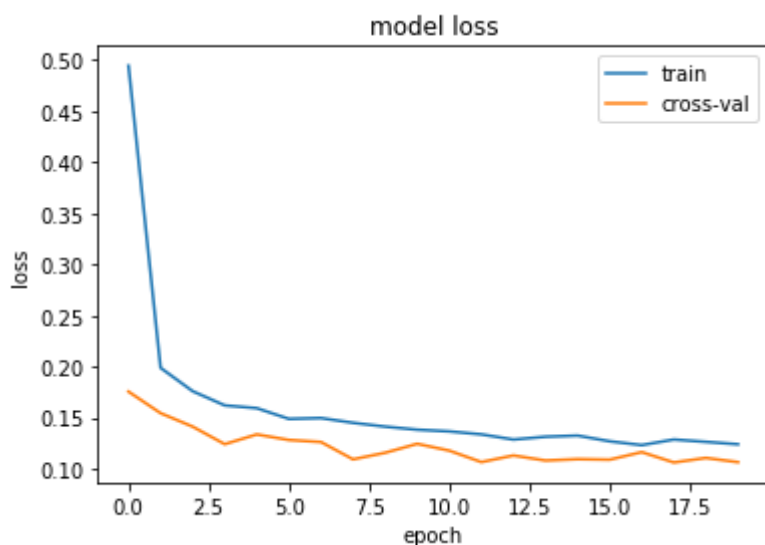
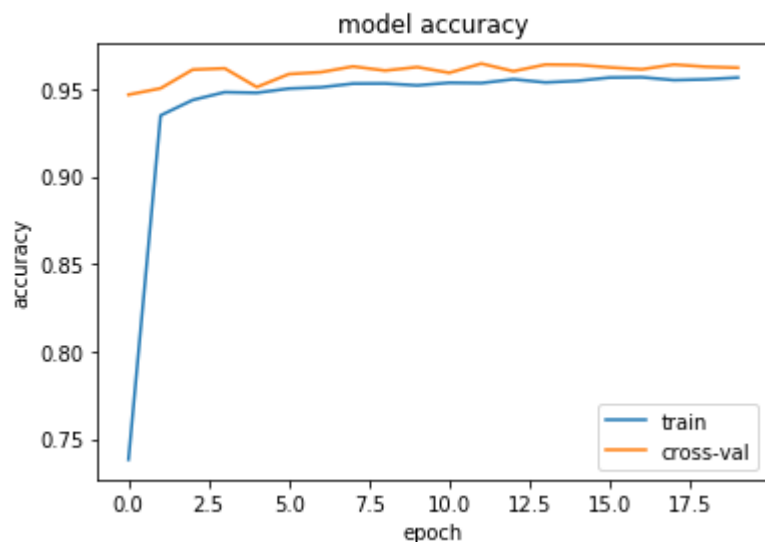
Epoch 1/20

517/516 [=====] - 88s 171ms/step - loss: 0.4944 - acc: 0.7383 - val\_loss: 0.1756 - val\_acc: 0.9468

Epoch 2/20

517/516 [=====] - 87s 167ms/step - loss: 0.1989 - acc: 0.9350 - val\_loss: 0.1545 - val\_acc: 0.9505

Epoch 3/20  
517/516 [=====] - 84s 163ms/step - loss: 0.1759 - acc: 0.9438 -  
val\_loss: 0.1413 - val\_acc: 0.9612  
Epoch 4/20  
517/516 [=====] - 87s 168ms/step - loss: 0.1621 - acc: 0.9483 -  
val\_loss: 0.1241 - val\_acc: 0.9619  
Epoch 5/20  
517/516 [=====] - 89s 171ms/step - loss: 0.1593 - acc: 0.9479 -  
val\_loss: 0.1337 - val\_acc: 0.9512  
Epoch 6/20  
517/516 [=====] - 91s 176ms/step - loss: 0.1488 - acc: 0.9504 -  
val\_loss: 0.1282 - val\_acc: 0.9586  
Epoch 7/20  
517/516 [=====] - 87s 169ms/step - loss: 0.1496 - acc: 0.9511 -  
val\_loss: 0.1262 - val\_acc: 0.9597  
Epoch 8/20  
517/516 [=====] - 90s 175ms/step - loss: 0.1452 - acc: 0.9532 -  
val\_loss: 0.1093 - val\_acc: 0.9630  
Epoch 9/20  
517/516 [=====] - 89s 172ms/step - loss: 0.1413 - acc: 0.9532 -  
val\_loss: 0.1157 - val\_acc: 0.9606  
Epoch 10/20  
517/516 [=====] - 87s 169ms/step - loss: 0.1383 - acc: 0.9522 -  
val\_loss: 0.1245 - val\_acc: 0.9626  
Epoch 11/20  
517/516 [=====] - 88s 170ms/step - loss: 0.1367 - acc: 0.9537 -  
val\_loss: 0.1178 - val\_acc: 0.9594  
Epoch 12/20  
517/516 [=====] - 94s 181ms/step - loss: 0.1336 - acc: 0.9535 -  
val\_loss: 0.1066 - val\_acc: 0.9646  
Epoch 13/20  
517/516 [=====] - 91s 175ms/step - loss: 0.1287 - acc: 0.9556 -  
val\_loss: 0.1130 - val\_acc: 0.9603  
Epoch 14/20  
517/516 [=====] - 89s 171ms/step - loss: 0.1314 - acc: 0.9538 -  
val\_loss: 0.1081 - val\_acc: 0.9641  
Epoch 15/20  
517/516 [=====] - 87s 168ms/step - loss: 0.1324 - acc: 0.9548 -  
val\_loss: 0.1095 - val\_acc: 0.9639  
Epoch 16/20  
517/516 [=====] - 89s 172ms/step - loss: 0.1269 - acc: 0.9567 -  
val\_loss: 0.1090 - val\_acc: 0.9624  
Epoch 17/20  
517/516 [=====] - 90s 174ms/step - loss: 0.1231 - acc: 0.9568 -  
val\_loss: 0.1163 - val\_acc: 0.9614  
Epoch 18/20  
517/516 [=====] - 88s 171ms/step - loss: 0.1287 - acc: 0.9551 -  
val\_loss: 0.1062 - val\_acc: 0.9641  
Epoch 19/20  
517/516 [=====] - 85s 164ms/step - loss: 0.1263 - acc: 0.9556 -  
val\_loss: 0.1106 - val\_acc: 0.9628  
Epoch 20/20  
517/516 [=====] - 86s 167ms/step - loss: 0.1240 - acc: 0.9566 -  
val\_loss: 0.1065 - val\_acc: 0.9623



Layer (type)	Output Shape	Param #
conv2d_7 (Conv2D)	(None, 62, 62, 32)	896
max_pooling2d_7 (MaxPooling2)	(None, 31, 31, 32)	0
conv2d_8 (Conv2D)	(None, 29, 29, 32)	9248
max_pooling2d_8 (MaxPooling2)	(None, 14, 14, 32)	0
conv2d_9 (Conv2D)	(None, 12, 12, 32)	9248
max_pooling2d_9 (MaxPooling2)	(None, 6, 6, 32)	0
conv2d_10 (Conv2D)	(None, 4, 4, 32)	9248
max_pooling2d_10 (MaxPooling)	(None, 2, 2, 32)	0
flatten_4 (Flatten)	(None, 128)	0
dense_7 (Dense)	(None, 128)	16512
dense_8 (Dense)	(None, 1)	129
Total params: 45,281		
Trainable params: 45,281		
Non-trainable params: 0		

Epoch 1/20

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517/516 [=====] - 88s 170ms/step - loss: 0.3764 - acc: 0.8228 -  
val_loss: 0.1531 - val_acc: 0.9525  
Epoch 2/20  
517/516 [=====] - 85s 164ms/step - loss: 0.1881 - acc: 0.9400 -  
val_loss: 0.1406 - val_acc: 0.9550  
Epoch 3/20  
517/516 [=====] - 86s 165ms/step - loss: 0.1656 - acc: 0.9457 -  
val_loss: 0.1309 - val_acc: 0.9610  
Epoch 4/20  
517/516 [=====] - 87s 168ms/step - loss: 0.1635 - acc: 0.9477 -  
val_loss: 0.1241 - val_acc: 0.9630  
Epoch 5/20  
517/516 [=====] - 86s 166ms/step - loss: 0.1593 - acc: 0.9488 -  
val_loss: 0.1602 - val_acc: 0.9441  
Epoch 6/20  
517/516 [=====] - 84s 163ms/step - loss: 0.1543 - acc: 0.9491 -  
val_loss: 0.1209 - val_acc: 0.9615  
Epoch 7/20  
517/516 [=====] - 87s 168ms/step - loss: 0.1506 - acc: 0.9493 -  
val_loss: 0.1299 - val_acc: 0.9579  
Epoch 8/20  
517/516 [=====] - 87s 167ms/step - loss: 0.1530 - acc: 0.9481 -  
val_loss: 0.1220 - val_acc: 0.9604  
Epoch 9/20  
517/516 [=====] - 86s 166ms/step - loss: 0.1489 - acc: 0.9499 -  
val_loss: 0.1298 - val_acc: 0.9575  
Epoch 10/20  
517/516 [=====] - 86s 166ms/step - loss: 0.1418 - acc: 0.9533 -  
val_loss: 0.1196 - val_acc: 0.9623  
Epoch 11/20  
517/516 [=====] - 87s 168ms/step - loss: 0.1413 - acc: 0.9510 -  
val_loss: 0.1183 - val_acc: 0.9614  
Epoch 12/20  
517/516 [=====] - 86s 167ms/step - loss: 0.1426 - acc: 0.9529 -  
val_loss: 0.1195 - val_acc: 0.9577  
Epoch 13/20  
517/516 [=====] - 84s 163ms/step - loss: 0.1412 - acc: 0.9511 -  
val_loss: 0.1166 - val_acc: 0.9619  
Epoch 14/20  
517/516 [=====] - 87s 168ms/step - loss: 0.1308 - acc: 0.9549 -  
val_loss: 0.1193 - val_acc: 0.9583  
Epoch 15/20  
517/516 [=====] - 87s 168ms/step - loss: 0.1355 - acc: 0.9531 -  
val_loss: 0.1084 - val_acc: 0.9626  
Epoch 16/20  
517/516 [=====] - 85s 164ms/step - loss: 0.1321 - acc: 0.9539 -  
val_loss: 0.1095 - val_acc: 0.9635  
Epoch 17/20  
517/516 [=====] - 85s 165ms/step - loss: 0.1348 - acc: 0.9537 -  
val_loss: 0.1078 - val_acc: 0.9630  
Epoch 18/20  
517/516 [=====] - 87s 169ms/step - loss: 0.1281 - acc: 0.9547 -  
val_loss: 0.1072 - val_acc: 0.9621  
Epoch 19/20  
517/516 [=====] - 86s 166ms/step - loss: 0.1264 - acc: 0.9549 -  
val_loss: 0.1050 - val_acc: 0.9623  
Epoch 20/20  
517/516 [=====] - 84s 163ms/step - loss: 0.1246 - acc: 0.9574 -  
val_loss: 0.1110 - val_acc: 0.9630
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