# train

Found 49198 images belonging to 2 classes.

Found 6080 images belonging to 2 classes.

Model: "sequential"

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Layer (type) Output Shape Param #

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conv2d (Conv2D) (None, 5001, 5, 64) 1600

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batch\_normalization (BatchNo (None, 5001, 5, 64) 256

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activation (Activation) (None, 5001, 5, 64) 0

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conv2d\_1 (Conv2D) (None, 1251, 5, 64) 98368

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batch\_normalization\_1 (Batch (None, 1251, 5, 64) 256

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activation\_1 (Activation) (None, 1251, 5, 64) 0

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conv2d\_2 (Conv2D) (None, 313, 5, 64) 98368

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batch\_normalization\_2 (Batch (None, 313, 5, 64) 256

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activation\_2 (Activation) (None, 313, 5, 64) 0

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max\_pooling2d (MaxPooling2D) (None, 156, 5, 64) 0

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batch\_normalization\_3 (Batch (None, 156, 5, 64) 256

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conv2d\_3 (Conv2D) (None, 39, 5, 128) 196736

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batch\_normalization\_4 (Batch (None, 39, 5, 128) 512

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activation\_3 (Activation) (None, 39, 5, 128) 0

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conv2d\_4 (Conv2D) (None, 10, 5, 128) 393344

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batch\_normalization\_5 (Batch (None, 10, 5, 128) 512

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activation\_4 (Activation) (None, 10, 5, 128) 0

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conv2d\_5 (Conv2D) (None, 3, 5, 128) 393344

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batch\_normalization\_6 (Batch (None, 3, 5, 128) 512

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activation\_5 (Activation) (None, 3, 5, 128) 0

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max\_pooling2d\_1 (MaxPooling2 (None, 1, 5, 128) 0

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flatten (Flatten) (None, 640) 0

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batch\_normalization\_7 (Batch (None, 640) 2560

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dense (Dense) (None, 2048) 1312768

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dropout (Dropout) (None, 2048) 0

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dense\_1 (Dense) (None, 2048) 4196352

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dropout\_1 (Dropout) (None, 2048) 0

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dense\_2 (Dense) (None, 1000) 2049000

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dense\_3 (Dense) (None, 2) 2002

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Total params: 8,747,002

Trainable params: 8,744,442

Non-trainable params: 2,560

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Epoch 1/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.6809 - accuracy: 0.5913 - val\_loss: 0.6324 - val\_accuracy: 0.6592

Epoch 2/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.5565 - accuracy: 0.7192 - val\_loss: 0.5745 - val\_accuracy: 0.7113

Epoch 3/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.4112 - accuracy: 0.8160 - val\_loss: 0.5970 - val\_accuracy: 0.7053

Epoch 4/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.2627 - accuracy: 0.8909 - val\_loss: 0.6431 - val\_accuracy: 0.7138

Epoch 5/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.1562 - accuracy: 0.9389 - val\_loss: 0.7773 - val\_accuracy: 0.7151

Epoch 6/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.1157 - accuracy: 0.9560 - val\_loss: 0.8748 - val\_accuracy: 0.6895

Epoch 7/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0961 - accuracy: 0.9645 - val\_loss: 0.9655 - val\_accuracy: 0.7238

Epoch 8/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0839 - accuracy: 0.9689 - val\_loss: 1.0130 - val\_accuracy: 0.7257

Epoch 9/300

1537/1537 [==============================] - 95s 61ms/step - loss: 0.0748 - accuracy: 0.9732 - val\_loss: 0.9250 - val\_accuracy: 0.7174

Epoch 10/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0720 - accuracy: 0.9739 - val\_loss: 1.2028 - val\_accuracy: 0.7130

Epoch 11/300

1537/1537 [==============================] - 95s 61ms/step - loss: 0.0680 - accuracy: 0.9761 - val\_loss: 1.1388 - val\_accuracy: 0.7224

Epoch 12/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0608 - accuracy: 0.9789 - val\_loss: 1.0014 - val\_accuracy: 0.7189

Epoch 13/300

1537/1537 [==============================] - 95s 61ms/step - loss: 0.0596 - accuracy: 0.9792 - val\_loss: 1.1532 - val\_accuracy: 0.7125

Epoch 14/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0516 - accuracy: 0.9825 - val\_loss: 1.1495 - val\_accuracy: 0.7229

Epoch 15/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0524 - accuracy: 0.9818 - val\_loss: 1.1968 - val\_accuracy: 0.7258

Epoch 16/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0496 - accuracy: 0.9840 - val\_loss: 1.3763 - val\_accuracy: 0.7242

Epoch 17/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0495 - accuracy: 0.9829 - val\_loss: 1.1185 - val\_accuracy: 0.7179

Epoch 18/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0467 - accuracy: 0.9840 - val\_loss: 1.4408 - val\_accuracy: 0.7260

Epoch 19/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0415 - accuracy: 0.9859 - val\_loss: 1.3967 - val\_accuracy: 0.7270

Epoch 20/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0400 - accuracy: 0.9865 - val\_loss: 1.4196 - val\_accuracy: 0.7275

Epoch 21/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0432 - accuracy: 0.9851 - val\_loss: 1.2429 - val\_accuracy: 0.7243

Epoch 22/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0368 - accuracy: 0.9876 - val\_loss: 1.2109 - val\_accuracy: 0.7229

Epoch 23/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0355 - accuracy: 0.9882 - val\_loss: 1.4063 - val\_accuracy: 0.7276

Epoch 24/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0394 - accuracy: 0.9876 - val\_loss: 1.4724 - val\_accuracy: 0.7252

Epoch 25/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0327 - accuracy: 0.9896 - val\_loss: 1.4704 - val\_accuracy: 0.7303

Epoch 26/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0360 - accuracy: 0.9877 - val\_loss: 1.2706 - val\_accuracy: 0.7362

Epoch 27/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0299 - accuracy: 0.9902 - val\_loss: 1.1210 - val\_accuracy: 0.7250

Epoch 28/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0327 - accuracy: 0.9895 - val\_loss: 1.2250 - val\_accuracy: 0.7257

Epoch 29/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0311 - accuracy: 0.9906 - val\_loss: 0.9911 - val\_accuracy: 0.7250

Epoch 30/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0317 - accuracy: 0.9903 - val\_loss: 1.2908 - val\_accuracy: 0.7266

Epoch 31/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0313 - accuracy: 0.9896 - val\_loss: 1.7129 - val\_accuracy: 0.7273

Epoch 32/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0283 - accuracy: 0.9908 - val\_loss: 1.2298 - val\_accuracy: 0.7178

Epoch 33/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0282 - accuracy: 0.9909 - val\_loss: 1.9169 - val\_accuracy: 0.7271

Epoch 34/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0242 - accuracy: 0.9924 - val\_loss: 1.6654 - val\_accuracy: 0.7247

Epoch 35/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0268 - accuracy: 0.9915 - val\_loss: 1.1427 - val\_accuracy: 0.7224

Epoch 36/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0249 - accuracy: 0.9921 - val\_loss: 1.9410 - val\_accuracy: 0.7247

Epoch 37/300

1537/1537 [==============================] - 94s 61ms/step - loss: 0.0263 - accuracy: 0.9922 - val\_loss: 0.9715 - val\_accuracy: 0.7202

Epoch 38/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0226 - accuracy: 0.9928 - val\_loss: 1.7428 - val\_accuracy: 0.7329

Epoch 39/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0226 - accuracy: 0.9929 - val\_loss: 1.7695 - val\_accuracy: 0.7270

Epoch 40/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0236 - accuracy: 0.9934 - val\_loss: 1.4667 - val\_accuracy: 0.7275

Epoch 41/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0227 - accuracy: 0.9927 - val\_loss: 1.6327 - val\_accuracy: 0.7347

Epoch 42/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0211 - accuracy: 0.9936 - val\_loss: 2.0722 - val\_accuracy: 0.7304

Epoch 43/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0216 - accuracy: 0.9929 - val\_loss: 2.1883 - val\_accuracy: 0.7266

Epoch 44/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0210 - accuracy: 0.9934 - val\_loss: 1.5465 - val\_accuracy: 0.7360

Epoch 45/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0207 - accuracy: 0.9939 - val\_loss: 1.9518 - val\_accuracy: 0.7362

Epoch 46/300

1537/1537 [==============================] - 95s 62ms/step - loss: 0.0198 - accuracy: 0.9937 - val\_loss: 2.2486 - val\_accuracy: 0.7354

Process finished with exit code 0

# test

Found 6144 images belonging to 2 classes.

########################################

loss & acc

[1.2799524068832397, 0.7247721552848816]

########################################

........................................

y\_prob

[[9.9967325e-01 3.2681256e-04]

[9.9521446e-01 4.7854944e-03]

[9.9980289e-01 1.9712881e-04]

...

[2.8263816e-08 1.0000000e+00]

[9.9646014e-01 3.5398565e-03]

[2.7587897e-01 7.2412097e-01]]

........................................

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y\_prob.shape

(6144, 2)

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label\_test

[[1. 0.]

[1. 0.]

[1. 0.]

...

[0. 1.]

[0. 1.]

[0. 1.]]

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label\_test.shape

(6144, 2)

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########################################

n\_classes

2

########################################

########################################

fpr

{0: array([0. , 0.00130208, 0.00260417, ..., 0.99967448, 0.99967448,

1. ]), 1: array([0. , 0.00651042, 0.00813802, ..., 0.99153646, 1. ,

1. ])}

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tpr

{0: array([0. , 0.03027344, 0.04166667, ..., 0.99967448, 1. ,

1. ]), 1: array([0. , 0.06282552, 0.07845052, ..., 0.99967448, 0.99967448,

1. ])}

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cnn\_roc\_auc

{0: 0.7913226551479763, 1: 0.7913050651550293}

########################################

Process finished with exit code 0