Model: "model"

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

Layer (type) Output Shape Param # Connected to

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

input\_1 (InputLayer) [(None, 64, 321, 1)] 0 []

conv2d (Conv2D) (None, 64, 321, 16) 496 ['input\_1[0][0]']

tf.math.reduce\_mean (TFOpL (None, 321, 16) 0 ['conv2d[0][0]']

ambda)

tf.math.reduce\_max (TFOpLa (None, 321, 16) 0 ['conv2d[0][0]']

mbda)

tf.expand\_dims (TFOpLambda (None, 1, 321, 16) 0 ['tf.math.reduce\_mean[0][0]']

)

tf.expand\_dims\_1 (TFOpLamb (None, 1, 321, 16) 0 ['tf.math.reduce\_max[0][0]']

da)

concatenate (Concatenate) (None, 1, 321, 32) 0 ['tf.expand\_dims[0][0]',

'tf.expand\_dims\_1[0][0]']

conv2d\_1 (Conv2D) (None, 1, 321, 1) 2049 ['concatenate[0][0]']

multiply (Multiply) (None, 64, 321, 16) 0 ['conv2d[0][0]',

'conv2d\_1[0][0]']

depthwise\_conv2d (Depthwis (None, 1, 321, 32) 2080 ['conv2d[0][0]']

eConv2D)

conv2d\_2 (Conv2D) (None, 1, 321, 16) 16400 ['multiply[0][0]']

conv2d\_3 (Conv2D) (None, 1, 321, 16) 16400 ['conv2d[0][0]']

concatenate\_1 (Concatenate (None, 1, 321, 64) 0 ['depthwise\_conv2d[0][0]',

) 'conv2d\_2[0][0]',

'conv2d\_3[0][0]']

global\_average\_pooling2d ( (None, 64) 0 ['concatenate\_1[0][0]']

GlobalAveragePooling2D)

global\_max\_pooling2d (Glob (None, 64) 0 ['concatenate\_1[0][0]']

alMaxPooling2D)

dense (Dense) (None, 8) 512 ['global\_average\_pooling2d[0][

0]',

'global\_max\_pooling2d[0][0]']

dense\_1 (Dense) (None, 64) 512 ['dense[0][0]',

'dense[1][0]']

tf.\_\_operators\_\_.add (TFOp (None, 64) 0 ['dense\_1[0][0]',

Lambda) 'dense\_1[1][0]']

activation (Activation) (None, 64) 0 ['tf.\_\_operators\_\_.add[0][0]']

multiply\_1 (Multiply) (None, 1, 321, 64) 0 ['concatenate\_1[0][0]',

'activation[0][0]']

average\_pooling2d (Average (None, 1, 21, 64) 0 ['multiply\_1[0][0]']

Pooling2D)

flatten (Flatten) (None, 1344) 0 ['average\_pooling2d[0][0]']

dense\_2 (Dense) (None, 80) 107600 ['flatten[0][0]']

dense\_3 (Dense) (None, 4) 324 ['dense\_2[0][0]']

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Total params: 146373 (571.77 KB)

Trainable params: 146373 (571.77 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 26s - loss: 1.2662 - accuracy: 0.3980 - val\_loss: 1.1104 - val\_accuracy: 0.5372 - 26s/epoch - 74ms/step

Epoch 2/10

353/353 - 24s - loss: 1.1342 - accuracy: 0.5166 - val\_loss: 1.0842 - val\_accuracy: 0.5578 - 24s/epoch - 67ms/step

Epoch 3/10

353/353 - 24s - loss: 1.0880 - accuracy: 0.5455 - val\_loss: 1.0964 - val\_accuracy: 0.5542 - 24s/epoch - 67ms/step

Epoch 4/10

353/353 - 24s - loss: 1.0505 - accuracy: 0.5648 - val\_loss: 1.0296 - val\_accuracy: 0.5819 - 24s/epoch - 67ms/step

Epoch 5/10

353/353 - 24s - loss: 1.0147 - accuracy: 0.5834 - val\_loss: 1.0397 - val\_accuracy: 0.5726 - 24s/epoch - 68ms/step

Epoch 6/10

353/353 - 24s - loss: 0.9840 - accuracy: 0.6027 - val\_loss: 1.0300 - val\_accuracy: 0.5840 - 24s/epoch - 68ms/step

Epoch 7/10

353/353 - 24s - loss: 0.9552 - accuracy: 0.6162 - val\_loss: 1.0130 - val\_accuracy: 0.5897 - 24s/epoch - 67ms/step

Epoch 8/10

353/353 - 24s - loss: 0.9253 - accuracy: 0.6330 - val\_loss: 1.0191 - val\_accuracy: 0.5826 - 24s/epoch - 68ms/step

Epoch 9/10

353/353 - 24s - loss: 0.8888 - accuracy: 0.6427 - val\_loss: 1.0066 - val\_accuracy: 0.5889 - 24s/epoch - 67ms/step

Epoch 10/10

353/353 - 24s - loss: 0.8614 - accuracy: 0.6532 - val\_loss: 1.0167 - val\_accuracy: 0.5840 - 24s/epoch - 68ms/step

56/56 - 2s - loss: 0.9945 - accuracy: 0.6083 - 2s/epoch - 28ms/step

Test loss: 0.9945499897003174

Test accuracy: 0.6082766652107239

56/56 [==============================] - 2s 24ms/step

Model: "model\_1"

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

Layer (type) Output Shape Param # Connected to

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

input\_2 (InputLayer) [(None, 64, 321, 1)] 0 []

conv2d\_4 (Conv2D) (None, 64, 321, 16) 496 ['input\_2[0][0]']

tf.math.reduce\_mean\_1 (TFO (None, 321, 16) 0 ['conv2d\_4[0][0]']

pLambda)

tf.math.reduce\_max\_1 (TFOp (None, 321, 16) 0 ['conv2d\_4[0][0]']

Lambda)

tf.expand\_dims\_2 (TFOpLamb (None, 1, 321, 16) 0 ['tf.math.reduce\_mean\_1[0][0]'

da) ]

tf.expand\_dims\_3 (TFOpLamb (None, 1, 321, 16) 0 ['tf.math.reduce\_max\_1[0][0]']

da)

concatenate\_2 (Concatenate (None, 1, 321, 32) 0 ['tf.expand\_dims\_2[0][0]',

) 'tf.expand\_dims\_3[0][0]']

conv2d\_5 (Conv2D) (None, 1, 321, 1) 2049 ['concatenate\_2[0][0]']

multiply\_2 (Multiply) (None, 64, 321, 16) 0 ['conv2d\_4[0][0]',

'conv2d\_5[0][0]']

depthwise\_conv2d\_1 (Depthw (None, 1, 321, 32) 2080 ['conv2d\_4[0][0]']

iseConv2D)

conv2d\_6 (Conv2D) (None, 1, 321, 16) 16400 ['multiply\_2[0][0]']

conv2d\_7 (Conv2D) (None, 1, 321, 16) 16400 ['conv2d\_4[0][0]']

concatenate\_3 (Concatenate (None, 1, 321, 64) 0 ['depthwise\_conv2d\_1[0][0]',

) 'conv2d\_6[0][0]',

'conv2d\_7[0][0]']

global\_average\_pooling2d\_1 (None, 64) 0 ['concatenate\_3[0][0]']

(GlobalAveragePooling2D)

global\_max\_pooling2d\_1 (Gl (None, 64) 0 ['concatenate\_3[0][0]']

obalMaxPooling2D)

dense\_4 (Dense) (None, 8) 512 ['global\_average\_pooling2d\_1[0

][0]',

'global\_max\_pooling2d\_1[0][0]

']

dense\_5 (Dense) (None, 64) 512 ['dense\_4[0][0]',

'dense\_4[1][0]']

tf.\_\_operators\_\_.add\_1 (TF (None, 64) 0 ['dense\_5[0][0]',

OpLambda) 'dense\_5[1][0]']

activation\_1 (Activation) (None, 64) 0 ['tf.\_\_operators\_\_.add\_1[0][0]

']

multiply\_3 (Multiply) (None, 1, 321, 64) 0 ['concatenate\_3[0][0]',

'activation\_1[0][0]']

average\_pooling2d\_1 (Avera (None, 1, 21, 64) 0 ['multiply\_3[0][0]']

gePooling2D)

flatten\_1 (Flatten) (None, 1344) 0 ['average\_pooling2d\_1[0][0]']

dense\_6 (Dense) (None, 80) 107600 ['flatten\_1[0][0]']

dense\_7 (Dense) (None, 4) 324 ['dense\_6[0][0]']

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Total params: 146373 (571.77 KB)

Trainable params: 146373 (571.77 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 27s - loss: 1.3197 - accuracy: 0.3422 - val\_loss: 1.1778 - val\_accuracy: 0.4387 - 27s/epoch - 75ms/step

Epoch 2/10

353/353 - 25s - loss: 1.1581 - accuracy: 0.4953 - val\_loss: 1.1171 - val\_accuracy: 0.5252 - 25s/epoch - 70ms/step

Epoch 3/10

353/353 - 25s - loss: 1.1071 - accuracy: 0.5311 - val\_loss: 1.0794 - val\_accuracy: 0.5521 - 25s/epoch - 70ms/step

Epoch 4/10

353/353 - 25s - loss: 1.0670 - accuracy: 0.5635 - val\_loss: 1.1003 - val\_accuracy: 0.5237 - 25s/epoch - 70ms/step

Epoch 5/10

353/353 - 25s - loss: 1.0469 - accuracy: 0.5720 - val\_loss: 1.0509 - val\_accuracy: 0.5677 - 25s/epoch - 70ms/step

Epoch 6/10

353/353 - 25s - loss: 1.0167 - accuracy: 0.5926 - val\_loss: 1.0491 - val\_accuracy: 0.5790 - 25s/epoch - 70ms/step

Epoch 7/10

353/353 - 24s - loss: 0.9918 - accuracy: 0.6038 - val\_loss: 1.0186 - val\_accuracy: 0.5804 - 24s/epoch - 68ms/step

Epoch 8/10

353/353 - 24s - loss: 0.9713 - accuracy: 0.6131 - val\_loss: 1.0196 - val\_accuracy: 0.5826 - 24s/epoch - 68ms/step

Epoch 9/10

353/353 - 24s - loss: 0.9479 - accuracy: 0.6202 - val\_loss: 1.0039 - val\_accuracy: 0.5882 - 24s/epoch - 68ms/step

Epoch 10/10

353/353 - 25s - loss: 0.9253 - accuracy: 0.6305 - val\_loss: 1.0406 - val\_accuracy: 0.5804 - 25s/epoch - 70ms/step

56/56 - 2s - loss: 1.0833 - accuracy: 0.5578 - 2s/epoch - 27ms/step

Test loss: 1.0833401679992676

Test accuracy: 0.557823121547699

56/56 [==============================] - 2s 28ms/step

Model: "model\_2"

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

Layer (type) Output Shape Param # Connected to

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input\_3 (InputLayer) [(None, 64, 321, 1)] 0 []

conv2d\_8 (Conv2D) (None, 64, 321, 16) 496 ['input\_3[0][0]']

tf.math.reduce\_mean\_2 (TFO (None, 321, 16) 0 ['conv2d\_8[0][0]']

pLambda)

tf.math.reduce\_max\_2 (TFOp (None, 321, 16) 0 ['conv2d\_8[0][0]']

Lambda)

tf.expand\_dims\_4 (TFOpLamb (None, 1, 321, 16) 0 ['tf.math.reduce\_mean\_2[0][0]'

da) ]

tf.expand\_dims\_5 (TFOpLamb (None, 1, 321, 16) 0 ['tf.math.reduce\_max\_2[0][0]']

da)

concatenate\_4 (Concatenate (None, 1, 321, 32) 0 ['tf.expand\_dims\_4[0][0]',

) 'tf.expand\_dims\_5[0][0]']

conv2d\_9 (Conv2D) (None, 1, 321, 1) 2049 ['concatenate\_4[0][0]']

multiply\_4 (Multiply) (None, 64, 321, 16) 0 ['conv2d\_8[0][0]',

'conv2d\_9[0][0]']

depthwise\_conv2d\_2 (Depthw (None, 1, 321, 32) 2080 ['conv2d\_8[0][0]']

iseConv2D)

conv2d\_10 (Conv2D) (None, 1, 321, 16) 16400 ['multiply\_4[0][0]']

conv2d\_11 (Conv2D) (None, 1, 321, 16) 16400 ['conv2d\_8[0][0]']

concatenate\_5 (Concatenate (None, 1, 321, 64) 0 ['depthwise\_conv2d\_2[0][0]',

) 'conv2d\_10[0][0]',

'conv2d\_11[0][0]']

global\_average\_pooling2d\_2 (None, 64) 0 ['concatenate\_5[0][0]']

(GlobalAveragePooling2D)

global\_max\_pooling2d\_2 (Gl (None, 64) 0 ['concatenate\_5[0][0]']

obalMaxPooling2D)

dense\_8 (Dense) (None, 8) 512 ['global\_average\_pooling2d\_2[0

][0]',

'global\_max\_pooling2d\_2[0][0]

']

dense\_9 (Dense) (None, 64) 512 ['dense\_8[0][0]',

'dense\_8[1][0]']

tf.\_\_operators\_\_.add\_2 (TF (None, 64) 0 ['dense\_9[0][0]',

OpLambda) 'dense\_9[1][0]']

activation\_2 (Activation) (None, 64) 0 ['tf.\_\_operators\_\_.add\_2[0][0]

']

multiply\_5 (Multiply) (None, 1, 321, 64) 0 ['concatenate\_5[0][0]',

'activation\_2[0][0]']

average\_pooling2d\_2 (Avera (None, 1, 21, 64) 0 ['multiply\_5[0][0]']

gePooling2D)

flatten\_2 (Flatten) (None, 1344) 0 ['average\_pooling2d\_2[0][0]']

dense\_10 (Dense) (None, 80) 107600 ['flatten\_2[0][0]']

dense\_11 (Dense) (None, 4) 324 ['dense\_10[0][0]']

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Total params: 146373 (571.77 KB)

Trainable params: 146373 (571.77 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 26s - loss: 1.2714 - accuracy: 0.3897 - val\_loss: 1.1737 - val\_accuracy: 0.4550 - 26s/epoch - 74ms/step

Epoch 2/10

353/353 - 24s - loss: 1.1610 - accuracy: 0.4930 - val\_loss: 1.1313 - val\_accuracy: 0.5287 - 24s/epoch - 68ms/step

Epoch 3/10

353/353 - 24s - loss: 1.1139 - accuracy: 0.5373 - val\_loss: 1.1005 - val\_accuracy: 0.5429 - 24s/epoch - 69ms/step

Epoch 4/10

353/353 - 24s - loss: 1.0860 - accuracy: 0.5453 - val\_loss: 1.1047 - val\_accuracy: 0.5372 - 24s/epoch - 68ms/step

Epoch 5/10

353/353 - 24s - loss: 1.0525 - accuracy: 0.5699 - val\_loss: 1.0980 - val\_accuracy: 0.5400 - 24s/epoch - 68ms/step

Epoch 6/10

353/353 - 24s - loss: 1.0262 - accuracy: 0.5880 - val\_loss: 1.0595 - val\_accuracy: 0.5656 - 24s/epoch - 68ms/step

Epoch 7/10

353/353 - 24s - loss: 1.0054 - accuracy: 0.5922 - val\_loss: 1.0519 - val\_accuracy: 0.5833 - 24s/epoch - 68ms/step

Epoch 8/10

353/353 - 24s - loss: 0.9842 - accuracy: 0.6078 - val\_loss: 1.0474 - val\_accuracy: 0.5712 - 24s/epoch - 68ms/step

Epoch 9/10

353/353 - 24s - loss: 0.9598 - accuracy: 0.6128 - val\_loss: 1.0546 - val\_accuracy: 0.5819 - 24s/epoch - 67ms/step

Epoch 10/10

353/353 - 24s - loss: 0.9427 - accuracy: 0.6204 - val\_loss: 1.0527 - val\_accuracy: 0.5620 - 24s/epoch - 68ms/step

56/56 - 2s - loss: 1.0051 - accuracy: 0.5981 - 2s/epoch - 28ms/step

Test loss: 1.0050979852676392

Test accuracy: 0.5980725884437561

56/56 [==============================] - 2s 28ms/step

Model: "model\_3"

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Layer (type) Output Shape Param # Connected to

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

input\_4 (InputLayer) [(None, 64, 321, 1)] 0 []

conv2d\_12 (Conv2D) (None, 64, 321, 16) 496 ['input\_4[0][0]']

tf.math.reduce\_mean\_3 (TFO (None, 321, 16) 0 ['conv2d\_12[0][0]']

pLambda)

tf.math.reduce\_max\_3 (TFOp (None, 321, 16) 0 ['conv2d\_12[0][0]']

Lambda)

tf.expand\_dims\_6 (TFOpLamb (None, 1, 321, 16) 0 ['tf.math.reduce\_mean\_3[0][0]'

da) ]

tf.expand\_dims\_7 (TFOpLamb (None, 1, 321, 16) 0 ['tf.math.reduce\_max\_3[0][0]']

da)

concatenate\_6 (Concatenate (None, 1, 321, 32) 0 ['tf.expand\_dims\_6[0][0]',

) 'tf.expand\_dims\_7[0][0]']

conv2d\_13 (Conv2D) (None, 1, 321, 1) 2049 ['concatenate\_6[0][0]']

multiply\_6 (Multiply) (None, 64, 321, 16) 0 ['conv2d\_12[0][0]',

'conv2d\_13[0][0]']

depthwise\_conv2d\_3 (Depthw (None, 1, 321, 32) 2080 ['conv2d\_12[0][0]']

iseConv2D)

conv2d\_14 (Conv2D) (None, 1, 321, 16) 16400 ['multiply\_6[0][0]']

conv2d\_15 (Conv2D) (None, 1, 321, 16) 16400 ['conv2d\_12[0][0]']

concatenate\_7 (Concatenate (None, 1, 321, 64) 0 ['depthwise\_conv2d\_3[0][0]',

) 'conv2d\_14[0][0]',

'conv2d\_15[0][0]']

global\_average\_pooling2d\_3 (None, 64) 0 ['concatenate\_7[0][0]']

(GlobalAveragePooling2D)

global\_max\_pooling2d\_3 (Gl (None, 64) 0 ['concatenate\_7[0][0]']

obalMaxPooling2D)

dense\_12 (Dense) (None, 8) 512 ['global\_average\_pooling2d\_3[0

][0]',

'global\_max\_pooling2d\_3[0][0]

']

dense\_13 (Dense) (None, 64) 512 ['dense\_12[0][0]',

'dense\_12[1][0]']

tf.\_\_operators\_\_.add\_3 (TF (None, 64) 0 ['dense\_13[0][0]',

OpLambda) 'dense\_13[1][0]']

activation\_3 (Activation) (None, 64) 0 ['tf.\_\_operators\_\_.add\_3[0][0]

']

multiply\_7 (Multiply) (None, 1, 321, 64) 0 ['concatenate\_7[0][0]',

'activation\_3[0][0]']

average\_pooling2d\_3 (Avera (None, 1, 21, 64) 0 ['multiply\_7[0][0]']

gePooling2D)

flatten\_3 (Flatten) (None, 1344) 0 ['average\_pooling2d\_3[0][0]']

dense\_14 (Dense) (None, 80) 107600 ['flatten\_3[0][0]']

dense\_15 (Dense) (None, 4) 324 ['dense\_14[0][0]']

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Total params: 146373 (571.77 KB)

Trainable params: 146373 (571.77 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 26s - loss: 1.2634 - accuracy: 0.3946 - val\_loss: 1.1640 - val\_accuracy: 0.4578 - 26s/epoch - 73ms/step

Epoch 2/10

353/353 - 24s - loss: 1.0940 - accuracy: 0.5306 - val\_loss: 1.0893 - val\_accuracy: 0.5422 - 24s/epoch - 68ms/step

Epoch 3/10

353/353 - 25s - loss: 1.0481 - accuracy: 0.5669 - val\_loss: 1.0803 - val\_accuracy: 0.5578 - 25s/epoch - 70ms/step

Epoch 4/10

353/353 - 24s - loss: 1.0226 - accuracy: 0.5688 - val\_loss: 1.0596 - val\_accuracy: 0.5500 - 24s/epoch - 69ms/step

Epoch 5/10

353/353 - 25s - loss: 0.9883 - accuracy: 0.5956 - val\_loss: 1.0513 - val\_accuracy: 0.5627 - 25s/epoch - 70ms/step

Epoch 6/10

353/353 - 25s - loss: 0.9596 - accuracy: 0.6114 - val\_loss: 1.0495 - val\_accuracy: 0.5776 - 25s/epoch - 72ms/step

Epoch 7/10

353/353 - 25s - loss: 0.9399 - accuracy: 0.6222 - val\_loss: 1.0149 - val\_accuracy: 0.5989 - 25s/epoch - 70ms/step

Epoch 8/10

353/353 - 25s - loss: 0.9159 - accuracy: 0.6266 - val\_loss: 1.0225 - val\_accuracy: 0.6017 - 25s/epoch - 70ms/step

Epoch 9/10

353/353 - 24s - loss: 0.8992 - accuracy: 0.6424 - val\_loss: 1.0398 - val\_accuracy: 0.5833 - 24s/epoch - 68ms/step

Epoch 10/10

353/353 - 24s - loss: 0.8650 - accuracy: 0.6511 - val\_loss: 1.0079 - val\_accuracy: 0.6095 - 24s/epoch - 69ms/step

56/56 - 2s - loss: 1.1526 - accuracy: 0.5334 - 2s/epoch - 28ms/step

Test loss: 1.1526131629943848

Test accuracy: 0.533446729183197

56/56 [==============================] - 2s 26ms/step

Model: "model\_4"

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

Layer (type) Output Shape Param # Connected to

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

input\_5 (InputLayer) [(None, 64, 321, 1)] 0 []

conv2d\_16 (Conv2D) (None, 64, 321, 16) 496 ['input\_5[0][0]']

tf.math.reduce\_mean\_4 (TFO (None, 321, 16) 0 ['conv2d\_16[0][0]']

pLambda)

tf.math.reduce\_max\_4 (TFOp (None, 321, 16) 0 ['conv2d\_16[0][0]']

Lambda)

tf.expand\_dims\_8 (TFOpLamb (None, 1, 321, 16) 0 ['tf.math.reduce\_mean\_4[0][0]'

da) ]

tf.expand\_dims\_9 (TFOpLamb (None, 1, 321, 16) 0 ['tf.math.reduce\_max\_4[0][0]']

da)

concatenate\_8 (Concatenate (None, 1, 321, 32) 0 ['tf.expand\_dims\_8[0][0]',

) 'tf.expand\_dims\_9[0][0]']

conv2d\_17 (Conv2D) (None, 1, 321, 1) 2049 ['concatenate\_8[0][0]']

multiply\_8 (Multiply) (None, 64, 321, 16) 0 ['conv2d\_16[0][0]',

'conv2d\_17[0][0]']

depthwise\_conv2d\_4 (Depthw (None, 1, 321, 32) 2080 ['conv2d\_16[0][0]']

iseConv2D)

conv2d\_18 (Conv2D) (None, 1, 321, 16) 16400 ['multiply\_8[0][0]']

conv2d\_19 (Conv2D) (None, 1, 321, 16) 16400 ['conv2d\_16[0][0]']

concatenate\_9 (Concatenate (None, 1, 321, 64) 0 ['depthwise\_conv2d\_4[0][0]',

) 'conv2d\_18[0][0]',

'conv2d\_19[0][0]']

global\_average\_pooling2d\_4 (None, 64) 0 ['concatenate\_9[0][0]']

(GlobalAveragePooling2D)

global\_max\_pooling2d\_4 (Gl (None, 64) 0 ['concatenate\_9[0][0]']

obalMaxPooling2D)

dense\_16 (Dense) (None, 8) 512 ['global\_average\_pooling2d\_4[0

][0]',

'global\_max\_pooling2d\_4[0][0]

']

dense\_17 (Dense) (None, 64) 512 ['dense\_16[0][0]',

'dense\_16[1][0]']

tf.\_\_operators\_\_.add\_4 (TF (None, 64) 0 ['dense\_17[0][0]',

OpLambda) 'dense\_17[1][0]']

activation\_4 (Activation) (None, 64) 0 ['tf.\_\_operators\_\_.add\_4[0][0]

']

multiply\_9 (Multiply) (None, 1, 321, 64) 0 ['concatenate\_9[0][0]',

'activation\_4[0][0]']

average\_pooling2d\_4 (Avera (None, 1, 21, 64) 0 ['multiply\_9[0][0]']

gePooling2D)

flatten\_4 (Flatten) (None, 1344) 0 ['average\_pooling2d\_4[0][0]']

dense\_18 (Dense) (None, 80) 107600 ['flatten\_4[0][0]']

dense\_19 (Dense) (None, 4) 324 ['dense\_18[0][0]']

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

Total params: 146373 (571.77 KB)

Trainable params: 146373 (571.77 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 27s - loss: 1.2371 - accuracy: 0.4293 - val\_loss: 1.1440 - val\_accuracy: 0.5127 - 27s/epoch - 76ms/step

Epoch 2/10

353/353 - 24s - loss: 1.1082 - accuracy: 0.5328 - val\_loss: 1.1138 - val\_accuracy: 0.5404 - 24s/epoch - 68ms/step

Epoch 3/10

353/353 - 24s - loss: 1.0688 - accuracy: 0.5519 - val\_loss: 1.1079 - val\_accuracy: 0.5312 - 24s/epoch - 69ms/step

Epoch 4/10

353/353 - 25s - loss: 1.0373 - accuracy: 0.5746 - val\_loss: 1.0919 - val\_accuracy: 0.5411 - 25s/epoch - 70ms/step

Epoch 5/10

353/353 - 24s - loss: 1.0054 - accuracy: 0.5886 - val\_loss: 1.0815 - val\_accuracy: 0.5446 - 24s/epoch - 69ms/step

Epoch 6/10

353/353 - 24s - loss: 0.9683 - accuracy: 0.6017 - val\_loss: 1.0500 - val\_accuracy: 0.5623 - 24s/epoch - 69ms/step

Epoch 7/10

353/353 - 24s - loss: 0.9410 - accuracy: 0.6205 - val\_loss: 1.0379 - val\_accuracy: 0.5899 - 24s/epoch - 69ms/step

Epoch 8/10

353/353 - 25s - loss: 0.9070 - accuracy: 0.6373 - val\_loss: 1.0215 - val\_accuracy: 0.5935 - 25s/epoch - 70ms/step

Epoch 9/10

353/353 - 24s - loss: 0.8800 - accuracy: 0.6423 - val\_loss: 1.0212 - val\_accuracy: 0.5786 - 24s/epoch - 69ms/step

Epoch 10/10

353/353 - 24s - loss: 0.8492 - accuracy: 0.6522 - val\_loss: 1.0272 - val\_accuracy: 0.5899 - 24s/epoch - 69ms/step

56/56 - 1s - loss: 1.0135 - accuracy: 0.5970 - 1s/epoch - 25ms/step

Test loss: 1.013529658317566

Test accuracy: 0.597048819065094

56/56 [==============================] - 1s 24ms/step

Mean loss: 1.049826192855835

Mean accuracy: 0.578933584690094