Model: "model"

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Layer (type) Output Shape Param # Connected to

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

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

reshape (Reshape) (None, 1, 321, 64) 0 ['input\_1[0][0]']

conv1d (Conv1D) (None, 1, 306, 32) 32800 ['reshape[0][0]']

conv2d (Conv2D) (None, 64, 297, 48) 1248 ['input\_1[0][0]']

separable\_conv2d (Separabl (None, 1, 282, 64) 2912 ['conv1d[0][0]']

eConv2D)

conv2d\_1 (Conv2D) (None, 1, 297, 64) 196672 ['conv2d[0][0]']

average\_pooling2d (Average (None, 1, 4, 64) 0 ['separable\_conv2d[0][0]']

Pooling2D)

concatenate (Concatenate) (None, 1, 301, 64) 0 ['conv2d\_1[0][0]',

'average\_pooling2d[0][0]']

average\_pooling2d\_1 (Avera (None, 1, 9, 64) 0 ['concatenate[0][0]']

gePooling2D)

flatten (Flatten) (None, 576) 0 ['average\_pooling2d\_1[0][0]']

dense (Dense) (None, 4) 2308 ['flatten[0][0]']

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Total params: 235940 (921.64 KB)

Trainable params: 235940 (921.64 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 30s - loss: 1.2874 - accuracy: 0.3886 - val\_loss: 1.1811 - val\_accuracy: 0.4940 - 30s/epoch - 84ms/step

Epoch 2/10

353/353 - 28s - loss: 1.1657 - accuracy: 0.5040 - val\_loss: 1.1507 - val\_accuracy: 0.5117 - 28s/epoch - 80ms/step

Epoch 3/10

353/353 - 28s - loss: 1.1281 - accuracy: 0.5277 - val\_loss: 1.1118 - val\_accuracy: 0.5507 - 28s/epoch - 78ms/step

Epoch 4/10

353/353 - 27s - loss: 1.0937 - accuracy: 0.5474 - val\_loss: 1.1118 - val\_accuracy: 0.5138 - 27s/epoch - 77ms/step

Epoch 5/10

353/353 - 27s - loss: 1.0633 - accuracy: 0.5593 - val\_loss: 1.0683 - val\_accuracy: 0.5578 - 27s/epoch - 78ms/step

Epoch 6/10

353/353 - 28s - loss: 1.0435 - accuracy: 0.5781 - val\_loss: 1.0574 - val\_accuracy: 0.5571 - 28s/epoch - 78ms/step

Epoch 7/10

353/353 - 27s - loss: 1.0223 - accuracy: 0.5789 - val\_loss: 1.0855 - val\_accuracy: 0.5450 - 27s/epoch - 78ms/step

Epoch 8/10

353/353 - 27s - loss: 1.0023 - accuracy: 0.5953 - val\_loss: 1.0630 - val\_accuracy: 0.5585 - 27s/epoch - 78ms/step

Epoch 9/10

353/353 - 28s - loss: 0.9765 - accuracy: 0.6071 - val\_loss: 1.0409 - val\_accuracy: 0.5712 - 28s/epoch - 79ms/step

Epoch 10/10

353/353 - 28s - loss: 0.9638 - accuracy: 0.6137 - val\_loss: 1.0319 - val\_accuracy: 0.5776 - 28s/epoch - 78ms/step

56/56 - 2s - loss: 1.0198 - accuracy: 0.5890 - 2s/epoch - 36ms/step

Test loss: 1.0198218822479248

Test accuracy: 0.589002251625061

56/56 [==============================] - 2s 35ms/step

Model: "model\_1"

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Layer (type) Output Shape Param # Connected to

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

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

reshape\_1 (Reshape) (None, 1, 321, 64) 0 ['input\_2[0][0]']

conv1d\_1 (Conv1D) (None, 1, 306, 32) 32800 ['reshape\_1[0][0]']

conv2d\_2 (Conv2D) (None, 64, 297, 48) 1248 ['input\_2[0][0]']

separable\_conv2d\_1 (Separa (None, 1, 282, 64) 2912 ['conv1d\_1[0][0]']

bleConv2D)

conv2d\_3 (Conv2D) (None, 1, 297, 64) 196672 ['conv2d\_2[0][0]']

average\_pooling2d\_2 (Avera (None, 1, 4, 64) 0 ['separable\_conv2d\_1[0][0]']

gePooling2D)

concatenate\_1 (Concatenate (None, 1, 301, 64) 0 ['conv2d\_3[0][0]',

) 'average\_pooling2d\_2[0][0]']

average\_pooling2d\_3 (Avera (None, 1, 9, 64) 0 ['concatenate\_1[0][0]']

gePooling2D)

flatten\_1 (Flatten) (None, 576) 0 ['average\_pooling2d\_3[0][0]']

dense\_1 (Dense) (None, 4) 2308 ['flatten\_1[0][0]']

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Total params: 235940 (921.64 KB)

Trainable params: 235940 (921.64 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 29s - loss: 1.3102 - accuracy: 0.3714 - val\_loss: 1.2214 - val\_accuracy: 0.4486 - 29s/epoch - 81ms/step

Epoch 2/10

353/353 - 27s - loss: 1.1598 - accuracy: 0.5084 - val\_loss: 1.1286 - val\_accuracy: 0.5202 - 27s/epoch - 77ms/step

Epoch 3/10

353/353 - 28s - loss: 1.1082 - accuracy: 0.5460 - val\_loss: 1.0946 - val\_accuracy: 0.5181 - 28s/epoch - 78ms/step

Epoch 4/10

353/353 - 27s - loss: 1.0746 - accuracy: 0.5621 - val\_loss: 1.1208 - val\_accuracy: 0.5202 - 27s/epoch - 78ms/step

Epoch 5/10

353/353 - 27s - loss: 1.0523 - accuracy: 0.5699 - val\_loss: 1.0916 - val\_accuracy: 0.5252 - 27s/epoch - 78ms/step

Epoch 6/10

353/353 - 27s - loss: 1.0273 - accuracy: 0.5910 - val\_loss: 1.0884 - val\_accuracy: 0.5514 - 27s/epoch - 77ms/step

Epoch 7/10

353/353 - 27s - loss: 1.0059 - accuracy: 0.5979 - val\_loss: 1.0667 - val\_accuracy: 0.5627 - 27s/epoch - 77ms/step

Epoch 8/10

353/353 - 28s - loss: 0.9822 - accuracy: 0.6075 - val\_loss: 1.0840 - val\_accuracy: 0.5535 - 28s/epoch - 79ms/step

Epoch 9/10

353/353 - 28s - loss: 0.9638 - accuracy: 0.6217 - val\_loss: 1.0929 - val\_accuracy: 0.5493 - 28s/epoch - 78ms/step

Epoch 10/10

353/353 - 27s - loss: 0.9460 - accuracy: 0.6302 - val\_loss: 1.0464 - val\_accuracy: 0.5648 - 27s/epoch - 78ms/step

56/56 - 2s - loss: 1.0735 - accuracy: 0.5499 - 2s/epoch - 36ms/step

Test loss: 1.0735141038894653

Test accuracy: 0.5498866438865662

56/56 [==============================] - 2s 35ms/step

Model: "model\_2"

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Layer (type) Output Shape Param # Connected to

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

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

reshape\_2 (Reshape) (None, 1, 321, 64) 0 ['input\_3[0][0]']

conv1d\_2 (Conv1D) (None, 1, 306, 32) 32800 ['reshape\_2[0][0]']

conv2d\_4 (Conv2D) (None, 64, 297, 48) 1248 ['input\_3[0][0]']

separable\_conv2d\_2 (Separa (None, 1, 282, 64) 2912 ['conv1d\_2[0][0]']

bleConv2D)

conv2d\_5 (Conv2D) (None, 1, 297, 64) 196672 ['conv2d\_4[0][0]']

average\_pooling2d\_4 (Avera (None, 1, 4, 64) 0 ['separable\_conv2d\_2[0][0]']

gePooling2D)

concatenate\_2 (Concatenate (None, 1, 301, 64) 0 ['conv2d\_5[0][0]',

) 'average\_pooling2d\_4[0][0]']

average\_pooling2d\_5 (Avera (None, 1, 9, 64) 0 ['concatenate\_2[0][0]']

gePooling2D)

flatten\_2 (Flatten) (None, 576) 0 ['average\_pooling2d\_5[0][0]']

dense\_2 (Dense) (None, 4) 2308 ['flatten\_2[0][0]']

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Total params: 235940 (921.64 KB)

Trainable params: 235940 (921.64 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 29s - loss: 1.2829 - accuracy: 0.4040 - val\_loss: 1.2100 - val\_accuracy: 0.4720 - 29s/epoch - 82ms/step

Epoch 2/10

353/353 - 28s - loss: 1.1706 - accuracy: 0.5047 - val\_loss: 1.1699 - val\_accuracy: 0.4798 - 28s/epoch - 80ms/step

Epoch 3/10

353/353 - 28s - loss: 1.1298 - accuracy: 0.5295 - val\_loss: 1.1299 - val\_accuracy: 0.5315 - 28s/epoch - 78ms/step

Epoch 4/10

353/353 - 27s - loss: 1.1092 - accuracy: 0.5440 - val\_loss: 1.1468 - val\_accuracy: 0.5202 - 27s/epoch - 78ms/step

Epoch 5/10

353/353 - 28s - loss: 1.0812 - accuracy: 0.5602 - val\_loss: 1.1012 - val\_accuracy: 0.5450 - 28s/epoch - 79ms/step

Epoch 6/10

353/353 - 28s - loss: 1.0469 - accuracy: 0.5848 - val\_loss: 1.1318 - val\_accuracy: 0.5195 - 28s/epoch - 79ms/step

Epoch 7/10

353/353 - 27s - loss: 1.0346 - accuracy: 0.5805 - val\_loss: 1.0985 - val\_accuracy: 0.5592 - 27s/epoch - 78ms/step

Epoch 8/10

353/353 - 28s - loss: 1.0061 - accuracy: 0.5954 - val\_loss: 1.0863 - val\_accuracy: 0.5528 - 28s/epoch - 79ms/step

Epoch 9/10

353/353 - 28s - loss: 0.9872 - accuracy: 0.5970 - val\_loss: 1.0811 - val\_accuracy: 0.5556 - 28s/epoch - 78ms/step

Epoch 10/10

353/353 - 28s - loss: 0.9653 - accuracy: 0.6131 - val\_loss: 1.0650 - val\_accuracy: 0.5556 - 28s/epoch - 78ms/step

56/56 - 2s - loss: 0.9966 - accuracy: 0.6151 - 2s/epoch - 35ms/step

Test loss: 0.9966287612915039

Test accuracy: 0.6150793433189392

56/56 [==============================] - 2s 36ms/step

Model: "model\_3"

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Layer (type) Output Shape Param # Connected to

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

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

reshape\_3 (Reshape) (None, 1, 321, 64) 0 ['input\_4[0][0]']

conv1d\_3 (Conv1D) (None, 1, 306, 32) 32800 ['reshape\_3[0][0]']

conv2d\_6 (Conv2D) (None, 64, 297, 48) 1248 ['input\_4[0][0]']

separable\_conv2d\_3 (Separa (None, 1, 282, 64) 2912 ['conv1d\_3[0][0]']

bleConv2D)

conv2d\_7 (Conv2D) (None, 1, 297, 64) 196672 ['conv2d\_6[0][0]']

average\_pooling2d\_6 (Avera (None, 1, 4, 64) 0 ['separable\_conv2d\_3[0][0]']

gePooling2D)

concatenate\_3 (Concatenate (None, 1, 301, 64) 0 ['conv2d\_7[0][0]',

) 'average\_pooling2d\_6[0][0]']

average\_pooling2d\_7 (Avera (None, 1, 9, 64) 0 ['concatenate\_3[0][0]']

gePooling2D)

flatten\_3 (Flatten) (None, 576) 0 ['average\_pooling2d\_7[0][0]']

dense\_3 (Dense) (None, 4) 2308 ['flatten\_3[0][0]']

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Total params: 235940 (921.64 KB)

Trainable params: 235940 (921.64 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 30s - loss: 1.2959 - accuracy: 0.3909 - val\_loss: 1.1984 - val\_accuracy: 0.4975 - 30s/epoch - 85ms/step

Epoch 2/10

353/353 - 27s - loss: 1.1446 - accuracy: 0.5137 - val\_loss: 1.1550 - val\_accuracy: 0.5046 - 27s/epoch - 78ms/step

Epoch 3/10

353/353 - 28s - loss: 1.1002 - accuracy: 0.5462 - val\_loss: 1.1133 - val\_accuracy: 0.5216 - 28s/epoch - 79ms/step

Epoch 4/10

353/353 - 28s - loss: 1.0670 - accuracy: 0.5618 - val\_loss: 1.0963 - val\_accuracy: 0.5344 - 28s/epoch - 78ms/step

Epoch 5/10

353/353 - 28s - loss: 1.0380 - accuracy: 0.5743 - val\_loss: 1.1050 - val\_accuracy: 0.5315 - 28s/epoch - 78ms/step

Epoch 6/10

353/353 - 28s - loss: 1.0154 - accuracy: 0.5866 - val\_loss: 1.0791 - val\_accuracy: 0.5471 - 28s/epoch - 78ms/step

Epoch 7/10

353/353 - 28s - loss: 0.9977 - accuracy: 0.5928 - val\_loss: 1.0743 - val\_accuracy: 0.5620 - 28s/epoch - 78ms/step

Epoch 8/10

353/353 - 28s - loss: 0.9770 - accuracy: 0.6045 - val\_loss: 1.0685 - val\_accuracy: 0.5599 - 28s/epoch - 78ms/step

Epoch 9/10

353/353 - 28s - loss: 0.9564 - accuracy: 0.6165 - val\_loss: 1.0539 - val\_accuracy: 0.5712 - 28s/epoch - 79ms/step

Epoch 10/10

353/353 - 28s - loss: 0.9352 - accuracy: 0.6268 - val\_loss: 1.0476 - val\_accuracy: 0.5819 - 28s/epoch - 78ms/step

56/56 - 2s - loss: 1.2289 - accuracy: 0.5170 - 2s/epoch - 36ms/step

Test loss: 1.2288672924041748

Test accuracy: 0.5170068144798279

56/56 [==============================] - 2s 36ms/step

Model: "model\_4"

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Layer (type) Output Shape Param # Connected to

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

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

reshape\_4 (Reshape) (None, 1, 321, 64) 0 ['input\_5[0][0]']

conv1d\_4 (Conv1D) (None, 1, 306, 32) 32800 ['reshape\_4[0][0]']

conv2d\_8 (Conv2D) (None, 64, 297, 48) 1248 ['input\_5[0][0]']

separable\_conv2d\_4 (Separa (None, 1, 282, 64) 2912 ['conv1d\_4[0][0]']

bleConv2D)

conv2d\_9 (Conv2D) (None, 1, 297, 64) 196672 ['conv2d\_8[0][0]']

average\_pooling2d\_8 (Avera (None, 1, 4, 64) 0 ['separable\_conv2d\_4[0][0]']

gePooling2D)

concatenate\_4 (Concatenate (None, 1, 301, 64) 0 ['conv2d\_9[0][0]',

) 'average\_pooling2d\_8[0][0]']

average\_pooling2d\_9 (Avera (None, 1, 9, 64) 0 ['concatenate\_4[0][0]']

gePooling2D)

flatten\_4 (Flatten) (None, 576) 0 ['average\_pooling2d\_9[0][0]']

dense\_4 (Dense) (None, 4) 2308 ['flatten\_4[0][0]']

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Total params: 235940 (921.64 KB)

Trainable params: 235940 (921.64 KB)

Non-trainable params: 0 (0.00 Byte)

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Epoch 1/10

353/353 - 29s - loss: 1.2887 - accuracy: 0.3944 - val\_loss: 1.2173 - val\_accuracy: 0.4710 - 29s/epoch - 81ms/step

Epoch 2/10

353/353 - 28s - loss: 1.1481 - accuracy: 0.5198 - val\_loss: 1.1571 - val\_accuracy: 0.4943 - 28s/epoch - 78ms/step

Epoch 3/10

353/353 - 27s - loss: 1.1046 - accuracy: 0.5427 - val\_loss: 1.1543 - val\_accuracy: 0.5198 - 27s/epoch - 78ms/step

Epoch 4/10

353/353 - 28s - loss: 1.0721 - accuracy: 0.5613 - val\_loss: 1.1159 - val\_accuracy: 0.5460 - 28s/epoch - 78ms/step

Epoch 5/10

353/353 - 28s - loss: 1.0469 - accuracy: 0.5725 - val\_loss: 1.1185 - val\_accuracy: 0.5319 - 28s/epoch - 79ms/step

Epoch 6/10

353/353 - 28s - loss: 1.0290 - accuracy: 0.5755 - val\_loss: 1.0947 - val\_accuracy: 0.5439 - 28s/epoch - 78ms/step

Epoch 7/10

353/353 - 28s - loss: 1.0011 - accuracy: 0.6021 - val\_loss: 1.1378 - val\_accuracy: 0.5305 - 28s/epoch - 78ms/step

Epoch 8/10

353/353 - 28s - loss: 0.9821 - accuracy: 0.6063 - val\_loss: 1.0764 - val\_accuracy: 0.5694 - 28s/epoch - 79ms/step

Epoch 9/10

353/353 - 28s - loss: 0.9610 - accuracy: 0.6088 - val\_loss: 1.0751 - val\_accuracy: 0.5744 - 28s/epoch - 78ms/step

Epoch 10/10

353/353 - 28s - loss: 0.9462 - accuracy: 0.6191 - val\_loss: 1.0724 - val\_accuracy: 0.5595 - 28s/epoch - 79ms/step

56/56 - 2s - loss: 1.0532 - accuracy: 0.5760 - 2s/epoch - 36ms/step

Test loss: 1.053152084350586

Test accuracy: 0.5760499238967896

56/56 [==============================] - 2s 35ms/step

Mean loss: 1.074396824836731

Mean accuracy: 0.5694049954414367