Table 2) DeepCNN network architecture

Layer (type) Output Shape Param #

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

conv2d\_1 (Conv2D) (None, 22, 991, 25) 275

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

batch\_normalization\_1 (Batch (None, 22, 991, 25) 100

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gaussian\_noise\_1 (GaussianNo (None, 22, 991, 25) 0

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conv2d\_2 (Conv2D) (None, 1, 991, 25) 13775

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batch\_normalization\_2 (Batch (None, 1, 991, 25) 100

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gaussian\_noise\_2 (GaussianNo (None, 1, 991, 25) 0

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spatial\_dropout2d\_1 (Spatial (None, 1, 991, 25) 0

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max\_pooling2d\_1 (MaxPooling2 (None, 1, 330, 25) 0

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reshape\_1 (Reshape) (None, 330, 25, 1) 0

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conv2d\_3 (Conv2D) (None, 321, 1, 50) 12550

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batch\_normalization\_3 (Batch (None, 321, 1, 50) 200

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spatial\_dropout2d\_2 (Spatial (None, 321, 1, 50) 0

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reshape\_2 (Reshape) (None, 321, 50, 1) 0

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max\_pooling2d\_2 (MaxPooling2 (None, 107, 50, 1) 0

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conv2d\_4 (Conv2D) (None, 98, 1, 100) 50100

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spatial\_dropout2d\_3 (Spatial (None, 98, 1, 100) 0

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reshape\_3 (Reshape) (None, 98, 100, 1) 0

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max\_pooling2d\_3 (MaxPooling2 (None, 49, 100, 1) 0

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conv2d\_5 (Conv2D) (None, 47, 1, 200) 60200

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batch\_normalization\_4 (Batch (None, 47, 1, 200) 800

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spatial\_dropout2d\_4 (Spatial (None, 47, 1, 200) 0

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

reshape\_4 (Reshape) (None, 47, 200, 1) 0

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max\_pooling2d\_4 (MaxPooling2 (None, 15, 200, 1) 0

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flatten\_1 (Flatten) (None, 3000) 0

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dense\_1 (Dense) (None, 4) 12004

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

Total params: 150,104

Trainable params: 149,504

Non-trainable params: 600

Table 3) ShallowCNN network architecture

Layer (type) Output Shape Param #

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

conv2d\_1 (Conv2D) (None, 22, 976, 40) 1040

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batch\_normalization\_1 (Batch (None, 22, 976, 40) 160

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conv2d\_2 (Conv2D) (None, 1, 976, 40) 35240

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batch\_normalization\_2 (Batch (None, 1, 976, 40) 160

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spatial\_dropout2d\_1 (Spatial (None, 1, 976, 40) 0

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

reshape\_1 (Reshape) (None, 976, 40, 1) 0

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average\_pooling2d\_1 (Average (None, 61, 40, 1) 0

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

flatten\_1 (Flatten) (None, 2440) 0

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

dense\_1 (Dense) (None, 4) 9764

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

Total params: 46,364

Trainable params: 46,204

Non-trainable params: 160

Table 3) RNN network architecture

Layer (type) Output Shape Param #

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

reshape\_5 (Reshape) (None, 22, 750) 0

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lstm\_1 (LSTM) (None, 12) 36624

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dropout\_1 (Dropout) (None, 12) 0

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

Total params: 36,624

Trainable params: 36,624

Non-trainable params: 0