**Multilayer Perceptron (MLP)**- Summary, Architecture, Training, Confusion Matrix

A diagram of a data flow

Description automatically generated

Model: "sequential\_1"

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Layer (type) Output Shape Param #

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

dense\_7 (Dense) (None, 25, 128) 23424

dense\_8 (Dense) (None, 25, 128) 16512

dense\_9 (Dense) (None, 25, 64) 8256

dense\_10 (Dense) (None, 25, 128) 8320

batch\_normalization\_1 (Bat (None, 25, 128) 512

chNormalization)

flatten\_1 (Flatten) (None, 3200) 0

dense\_11 (Dense) (None, 64) 204864

dense\_12 (Dense) (None, 32) 2080

dense\_13 (Dense) (None, 8) 264

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

Total params: 264232 (1.01 MB)

Trainable params: 263976 (1.01 MB)

Non-trainable params: 256 (1.00 KB)

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A graph of loss and loss

Description automatically generated

A diagram of a confusion matrix

Description automatically generated

**1-Dimensional Convolutional Neural Network-** Summary, Architecture, Training, Confusion Matrix

A diagram of a computer program

Description automatically generated

Model: "sequential"

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Layer (type) Output Shape Param #

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

conv1d (Conv1D) (None, 23, 128) 70016

max\_pooling1d (MaxPooling1 (None, 11, 128) 0

D)

conv1d\_1 (Conv1D) (None, 10, 128) 32896

max\_pooling1d\_1 (MaxPoolin (None, 5, 128) 0

g1D)

conv1d\_2 (Conv1D) (None, 4, 128) 32896

max\_pooling1d\_2 (MaxPoolin (None, 2, 128) 0

g1D)

flatten (Flatten) (None, 256) 0

dense (Dense) (None, 128) 32896

dense\_1 (Dense) (None, 8) 1032

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

Total params: 169736 (663.03 KB)

Trainable params: 169736 (663.03 KB)

Non-trainable params: 0 (0.00 Byte)

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*One-Layer 1D CNN*

A graph of loss and loss

Description automatically generated

A diagram of a confused matrix

Description automatically generated

*Two-Layer 1D CNN*

A graph of loss and loss

Description automatically generated

A diagram of a graph

Description automatically generated with medium confidence

**Long Short-Term Memory (LSTM)-** Summary, Architecture, Training, Confusion Matrix

One-layer LSTM

A graph of loss and loss

Description automatically generated

A diagram of a confused matrix

Description automatically generated

Two-layer LSTM

A diagram of a function

Description automatically generated

Model: "sequential"

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

Layer (type) Output Shape Param #

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

lstm (LSTM) (None, 25, 256) 449536

lstm\_1 (LSTM) (None, 64) 82176

dense (Dense) (None, 128) 8320

dense\_1 (Dense) (None, 256) 33024

dense\_2 (Dense) (None, 64) 16448

flatten (Flatten) (None, 64) 0

dense\_3 (Dense) (None, 64) 4160

dense\_4 (Dense) (None, 8) 520

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

Total params: 594184 (2.27 MB)

Trainable params: 594184 (2.27 MB)

Non-trainable params: 0 (0.00 Byte)

A graph of loss and loss

Description automatically generated

A diagram of a confusion matrix

Description automatically generated

**BiDirectional Long Short-Term Memory (BiLSTM)-** Summary, Architecture, Training, Confusion Matrix

A diagram of a computer program

Description automatically generated with medium confidence

Model: "sequential"

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Layer (type) Output Shape Param #

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

bidirectional (Bidirection (None, 45, 1024) 3031040

al)

dense (Dense) (None, 45, 128) 131200

dense\_1 (Dense) (None, 45, 768) 99072

batch\_normalization (Batch (None, 45, 768) 3072

Normalization)

flatten (Flatten) (None, 34560) 0

dropout (Dropout) (None, 34560) 0

dense\_2 (Dense) (None, 512) 17695232

dense\_3 (Dense) (None, 512) 262656

dense\_4 (Dense) (None, 8) 4104

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

Total params: 21226376 (80.97 MB)

Trainable params: 21224840 (80.97 MB)

Non-trainable params: 1536 (6.00 KB)

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A graph of loss and loss

Description automatically generated

A diagram of a confusion matrix

Description automatically generated

**Transformer-** Summary, Architecture, Training, Confusion Matrix

A diagram of a data flow

Description automatically generated

Model: "sequential\_1"

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

Layer (type) Output Shape Param #

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

embedding (Embedding) (None, 400, 50) 17050

transformer\_block (Transfo (None, 400, 50) 15500

rmerBlock)

global\_average\_pooling1d ( (None, 50) 0

GlobalAveragePooling1D)

dense\_6 (Dense) (None, 128) 6528

dense\_7 (Dense) (None, 64) 8256

flatten (Flatten) (None, 64) 0

dense\_8 (Dense) (None, 32) 2080

dense\_9 (Dense) (None, 64) 2112

dense\_10 (Dense) (None, 128) 8320

dense\_11 (Dense) (None, 8) 1032

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

Total params: 60878 (237.80 KB)

Trainable params: 60878 (237.80 KB)

Non-trainable params: 0 (0.00 Byte)

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A graph of loss and loss

Description automatically generated

A diagram of a confusion matrix

Description automatically generated