Epoch - 30

Train test split - 80:20

Layers - 3

Batch size - 64

Random number - 42

Optimizer = Adam

| Model | Train accuracy | Test accuracy | Train loss | Test loss | F1 |
| --- | --- | --- | --- | --- | --- |
| Simple RNN | 95.46 | 93.93 | 0.06 | 0.25 | 0.71 |
| Simple RNN |  |  |  |  |  |
| LSTM | 93.39 | 89.48 | 0.21 | 0.52 |  |
| LSTM |  |  |  |  |  |
| Bi- LSTM | 97.44 | 94.10 | 0.05 | 0.24 |  |
| Bi- LSTM [H] | 96.47 | 95.60 | 0.09 | 0.13 |  |
| GRU | 97.75 | 93.85 | 0.04 | 0.26 | 0.66 |
| Bi GRU |  |  |  |  |  |
| HMM | 81.60 | 81.53 | 8.3442 | 8.354 |  |

Best BiLSTM Hyperparameters found:

Embedding Dropout: 0.50

Number of BiLSTM Layers: 2

LSTM Units (Layer 0): 64

BiLSTM Dropout (Layer 0): 0.10

LSTM Units (Layer 1): 64

BiLSTM Dropout (Layer 1): 0.30

Learning Rate: 0.01000

Test : 0.9450863599777222

Train: 0.9580976366996765

Best GRU Hyperparameters found:

Embedding Dropout: 0.50

Number of BiGRU Layers: 1

GRU Units (Layer 0): 192

BiGRU Dropout (Layer 0): 0.10

Learning Rate: 0.01000

Bi GRU: test acc : 0.9540059566497803

Train : 0.957085132598877

Best SimpleRNN

val\_accuracy: 0.9553659558296204

Best val\_accuracy So Far: 0.9574502110481262

Total elapsed time: 00h 45m 57s

The optimal number of RNN layers is 1.

The optimal embedding output dimension is 32.

The optimal number of units in the RNN layers are: [32].

The optimal learning rate for the optimizer is 0.01.

64/64 ━━━━━━━━━━━━━━━━━━━━ 13s 80ms/step - accuracy: 0.9589 - loss: 0.1409

Best model test accuracy: 0.9574502110481262

Evaluating the Final Model ---

Test Loss: 0.4400

Test Accuracy: 0.8882