

Experiments Report

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SVM Experiment

Training Accuaracy: 100.0%

Testing Accuaracy: 90.0%

Precision: 0.8571428571428571

Recall: 0.8595429845379904

F1 score: 0.8568435049952878

FFNN Experiment

Accuracies: [0.75636363 0.77272725 0.75409836]

Accuracy Variance: 0.008299499934341415

Accuracy Mean: 80.0%

Training Accuaracy: 93.3%

Testing Accuaracy: 85.2%

Precision: 0.8884928226470947

Recall: 0.7773541212081909

F1 score: 0.8285248279571533

Model: "sequential_11"

Layer (type)	Output Shape	Param #
flatten_7 (Flatten)	(None, 10000)	0
dense_36 (Dense)	(None, 2048)	20482048
dropout_14 (Dropout)	(None, 2048)	0
dense_37 (Dense)	(None, 1024)	2098176
dropout_15 (Dropout)	(None, 1024)	0
dense_38 (Dense)	(None, 512)	524800
dense_39 (Dense)	(None, 10)	5130
Total params: 23,110,154		
Trainable params: 23,110,154		
Non-trainable params: 0		

LSTM Experiment

Accuracies: [0.89272726 0.87454545 0.87613845]

Accuracy Variance: 0.008221273435511225

Accuracy Mean: 90.0%

Training Accuaracy: 99.9%

Testing Accuaracy: 91.5%

Precision: 0.33148959279060364

Recall: 0.9903846383094788

F1 score: 0.49642473459243774

Model: "sequential_15"

Layer (type)	Output Shape	Param #
lstm_7 (LSTM)	(None, 128)	117248
dense_46 (Dense)	(None, 64)	8256
dense_47 (Dense)	(None, 10)	650
Total params: 126,154		
Trainable params: 126,154		
Non-trainable params: 0		

CNN Experiment

Accuracies: [0.92909092 0.9218182 0.90892529]

Accuracy Variance: 0.008338476416481857

Accuracy Mean: 90.0%

Training Accuaracy: 100.0%

Testing Accuaracy: 97.3%

Precision: 0.9754027128219604

Recall: 0.9660974740982056

F1 score: 0.9706761837005615

Model: "sequential_23"

Layer (type)	Output Shape	Param #
conv2d_14 (Conv2D)	(None, 49, 49, 32)	1568
activation_14 (Activation)	(None, 49, 49, 32)	0
max_pooling2d_14 (MaxPoolin g2D)	(None, 24, 24, 32)	0
conv2d_15 (Conv2D)	(None, 21, 21, 64)	32832

activation_15 (Activation)	(None, 21, 21, 64)	0
max_pooling2d_15 (MaxPoolin g2D)	(None, 10, 10, 64)	0
dropout_30 (Dropout)	(None, 10, 10, 64)	0
flatten_15 (Flatten)	(None, 6400)	0
batch_normalization_14 (Bat chNormalization)	(None, 6400)	25600
dense_62 (Dense)	(None, 256)	1638656
dropout_31 (Dropout)	(None, 256)	0
batch_normalization_15 (Bat chNormalization)	(None, 256)	1024
dense_63 (Dense)	(None, 10)	2570

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Total params: 1,702,250
Trainable params: 1,688,938
Non-trainable params: 13,312
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