

## Dataset 1: PlantVillage

### BASE MODELS

#### MODEL 1 – CNN

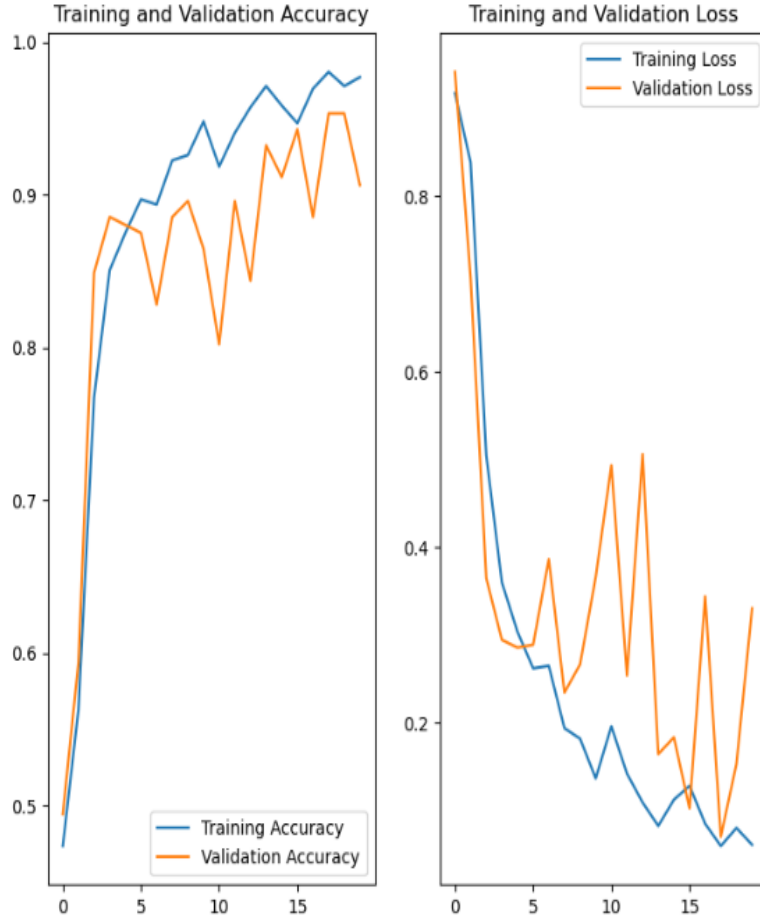
##### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 2152 (Early Blight: 1000, Late Blight: 1000, Healthy: 152) – 80:10:10 Split	
<b>Train</b>	1728
<b>Validation</b>	192
<b>Test</b>	232

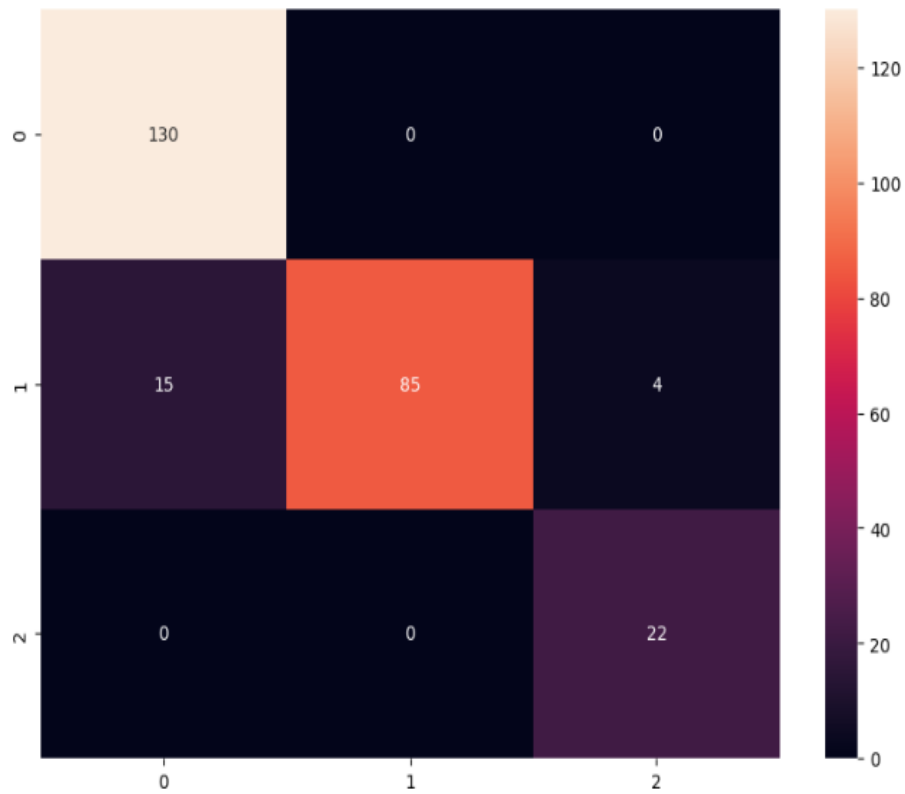
##### *Model Summary*

- Image Size: 256 x 256
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 20

##### *Graph*



## Confusion Matrix



Misclassification Rate: 6.09 % (0.00%, 18.27%, 0.00%)

## Predictions



## MODEL 2 – ResNet50

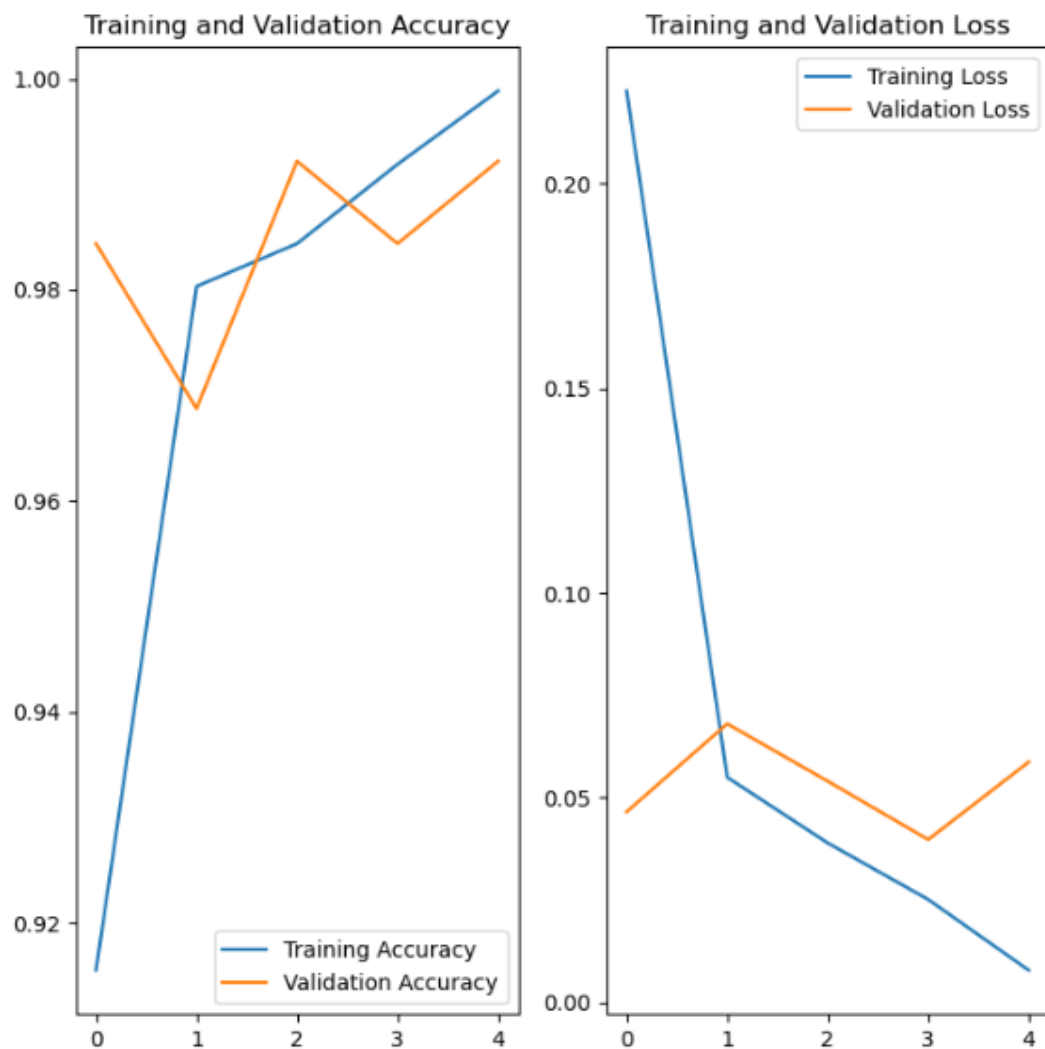
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 2152 (Early Blight: 1000, Late Blight: 1000, Healthy: 152) – 80:10:10 Split	
<b>Train</b>	1728
<b>Validation</b>	192
<b>Test</b>	232

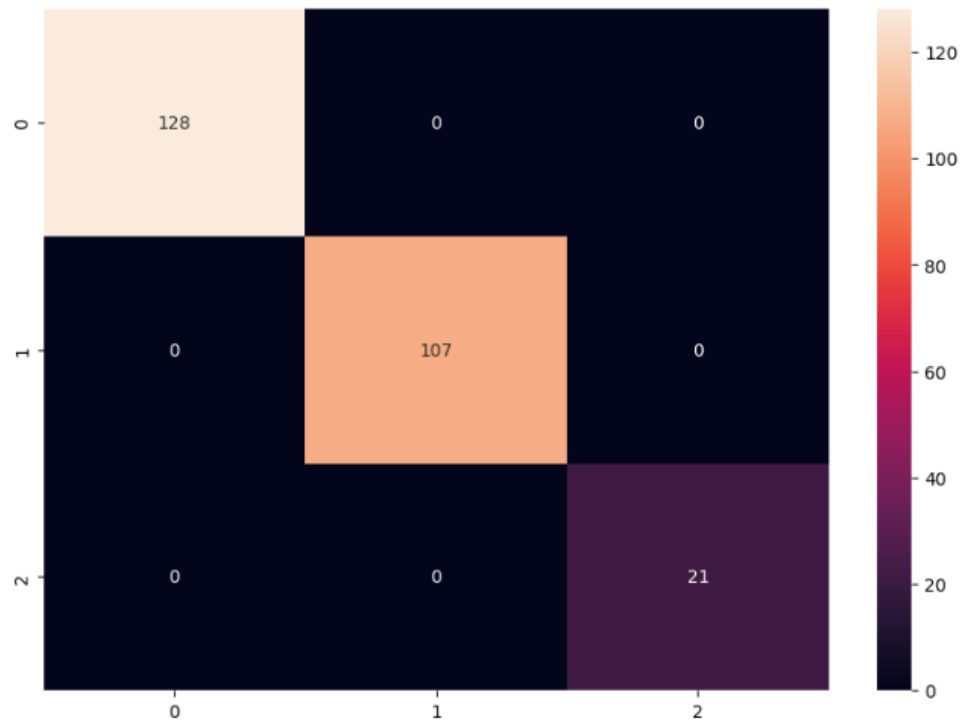
### *Model Summary*

- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 5

### *Graph*



## Confusion Matrix



Misclassification Rate: 0% (0.00%, 0.00%, 0.00%)

## Predictions

Actual: Potato\_healthy,  
Predicted: Potato\_healthy,  
Confidence: 99.95%



Actual: Potato\_Late\_blight,  
Predicted: Potato\_Late\_blight,  
Confidence: 100.0%



Actual: Potato\_Early\_blight,  
Predicted: Potato\_Early\_blight,  
Confidence: 100.0%



Actual: Potato\_healthy,  
Predicted: Potato\_healthy,  
Confidence: 99.82%



Actual: Potato\_Late\_blight,  
Predicted: Potato\_Late\_blight,  
Confidence: 100.0%



Actual: Potato\_Early\_blight,  
Predicted: Potato\_Early\_blight,  
Confidence: 100.0%



## MODEL 3 – VGG16

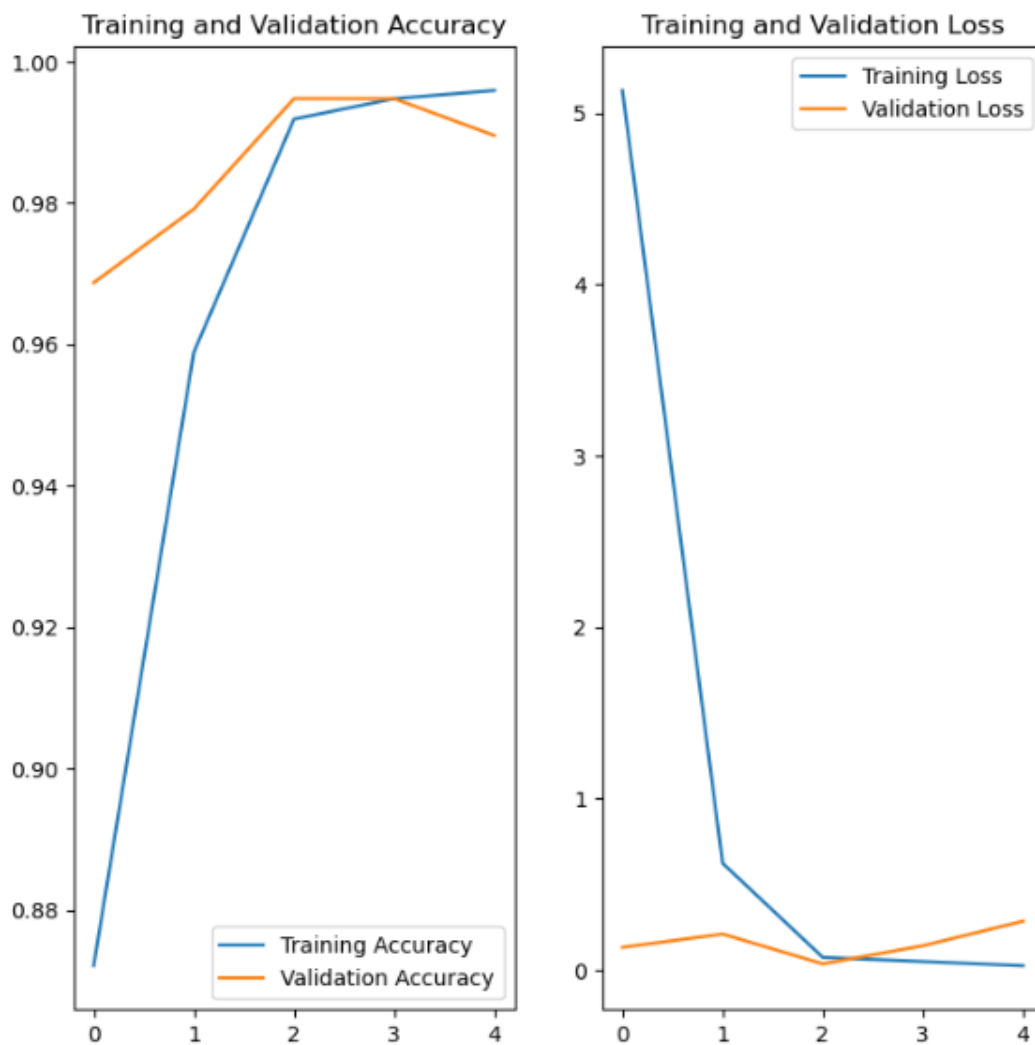
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 2152 (Early Blight: 1000, Late Blight: 1000, Healthy: 152) – 80:10:10 Split	
<b>Train</b>	1728
<b>Validation</b>	192
<b>Test</b>	232

### *Model Summary*

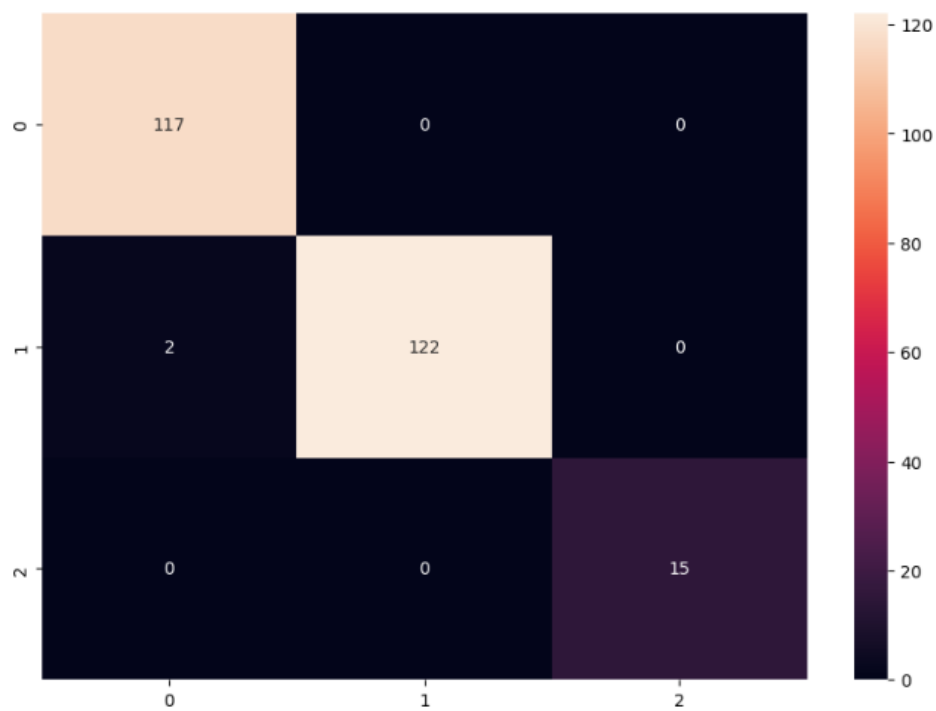
- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 3

### *Graph*



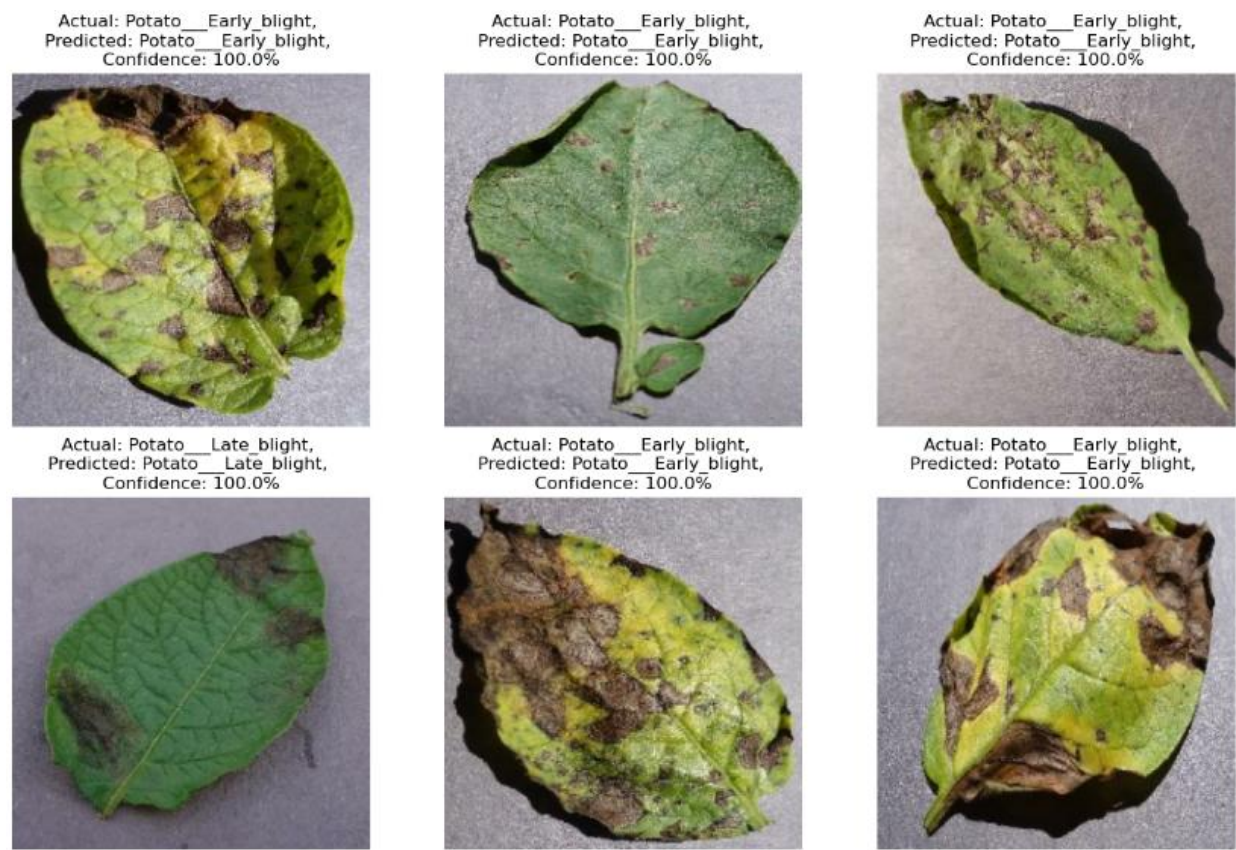


*Confusion Matrix*



Misclassification Rate: 0.54% (0.00%, 1.61%, 0.00%)

*Predictions*



## MODEL 4 – VGG19

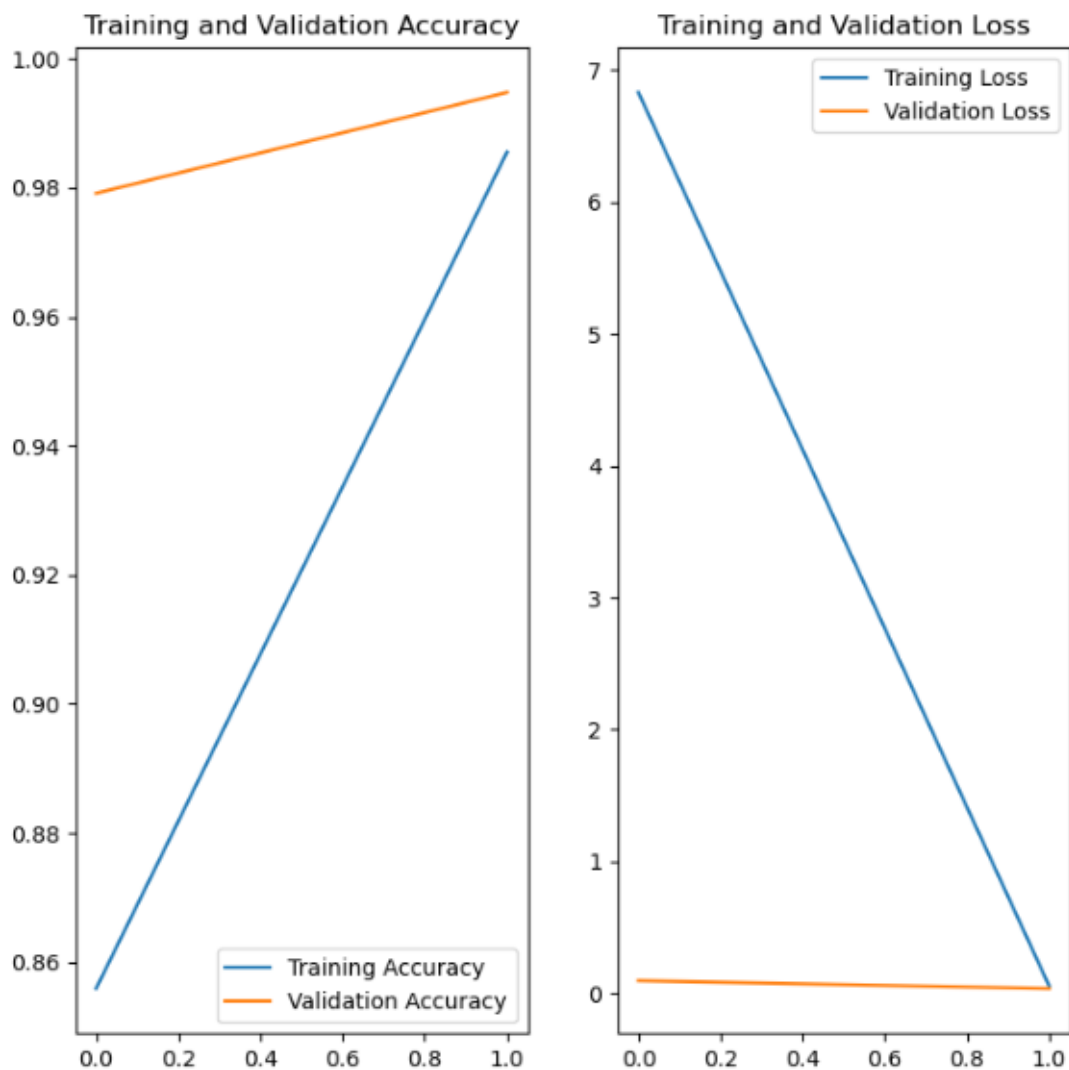
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 2152 (Early Blight: 1000, Late Blight: 1000, Healthy: 152) – 80:10:10 Split	
<b>Train</b>	1728
<b>Validation</b>	192
<b>Test</b>	232

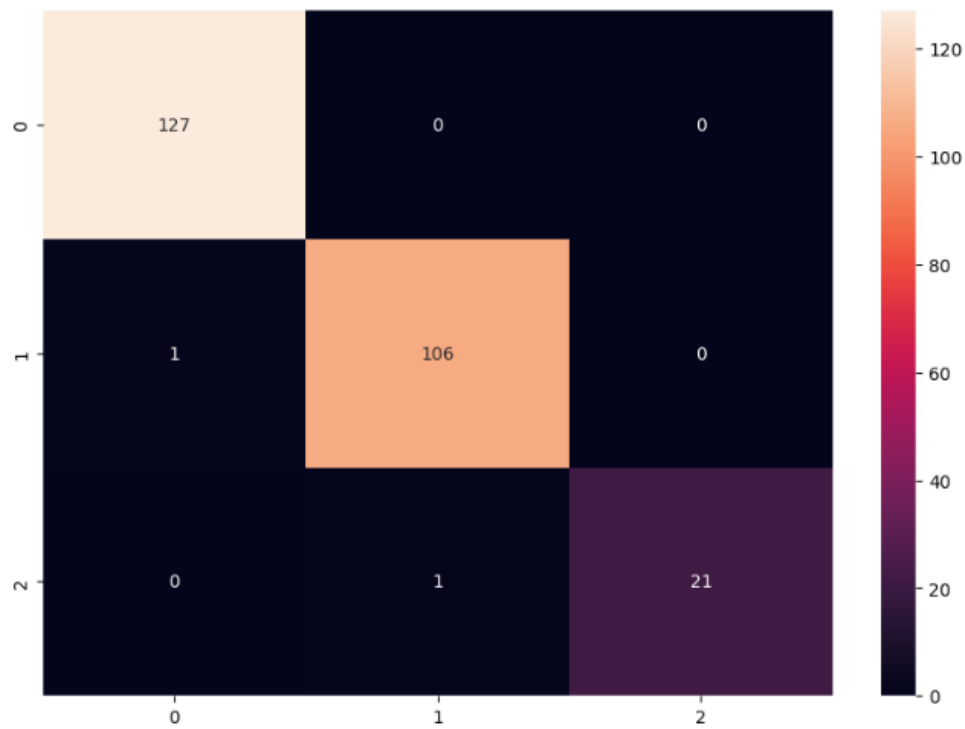
### *Model Summary*

- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 2

### *Graph*



## Confusion Matrix



Misclassification Rate: 1.82% (0.00%, 0.93%, 4.54%)

## Predictions

Actual: Potato\_\_Late\_blight,  
Predicted: Potato\_\_Late\_blight,  
Confidence: 100.0%



Actual: Potato\_\_Late\_blight,  
Predicted: Potato\_\_Late\_blight,  
Confidence: 100.0%



Actual: Potato\_\_Late\_blight,  
Predicted: Potato\_\_Late\_blight,  
Confidence: 100.0%



Actual: Potato\_\_Early\_blight,  
Predicted: Potato\_\_Early\_blight,  
Confidence: 100.0%



Actual: Potato\_\_Early\_blight,  
Predicted: Potato\_\_Early\_blight,  
Confidence: 100.0%



Actual: Potato\_\_Early\_blight,  
Predicted: Potato\_\_Early\_blight,  
Confidence: 100.0%





## MODEL 5 – InceptionV3

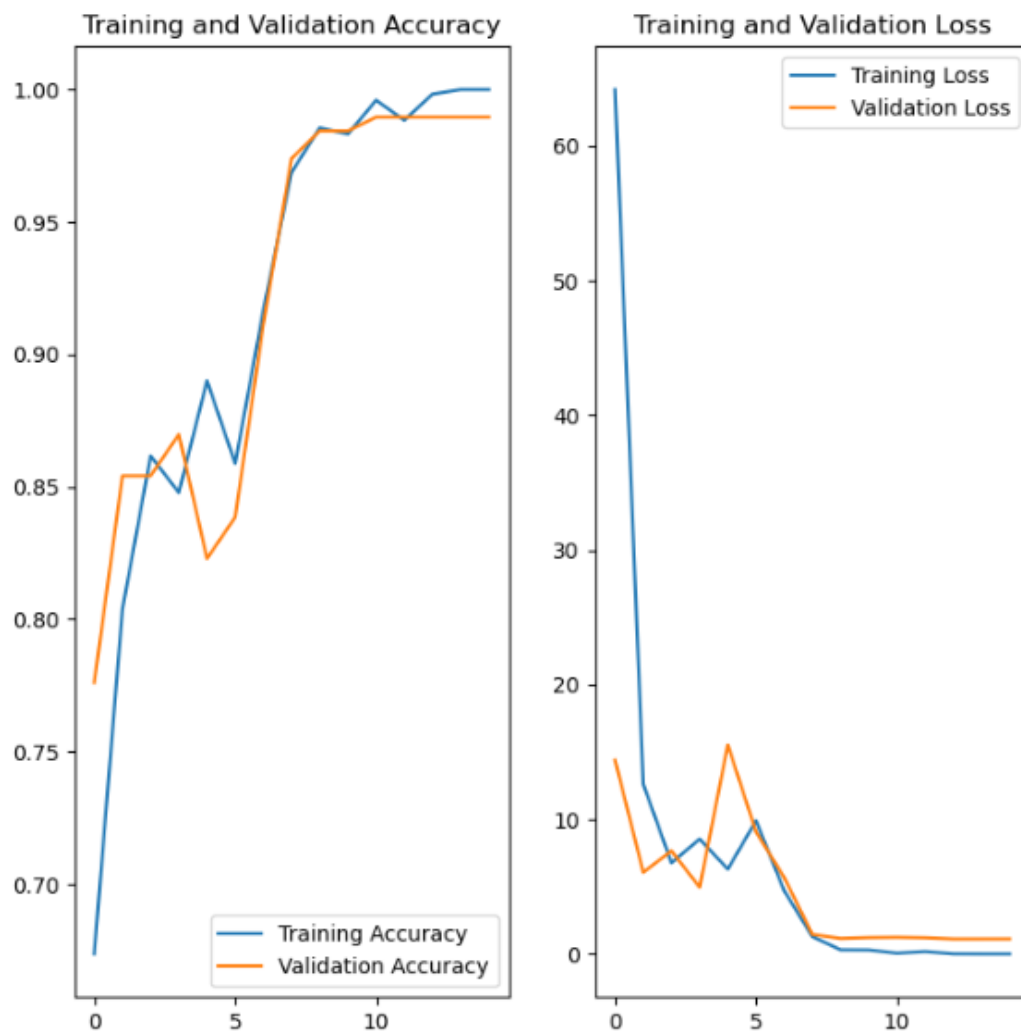
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 2152 (Early Blight: 1000, Late Blight: 1000, Healthy: 152) – 80:10:10 Split	
<b>Train</b>	1728
<b>Validation</b>	192
<b>Test</b>	232

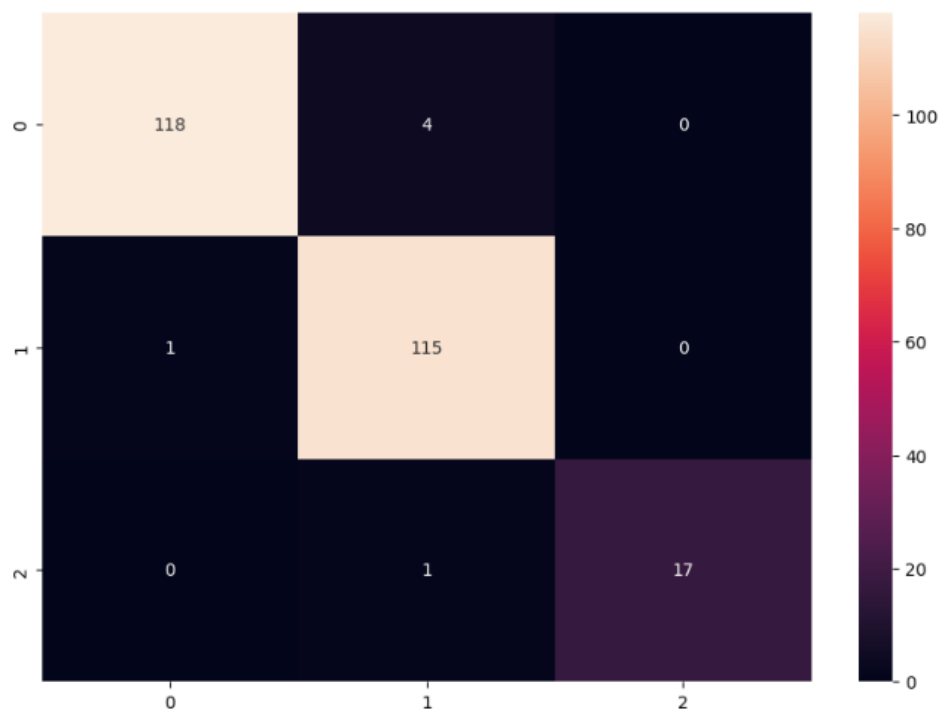
### *Model Summary*

- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 15

### *Graph*

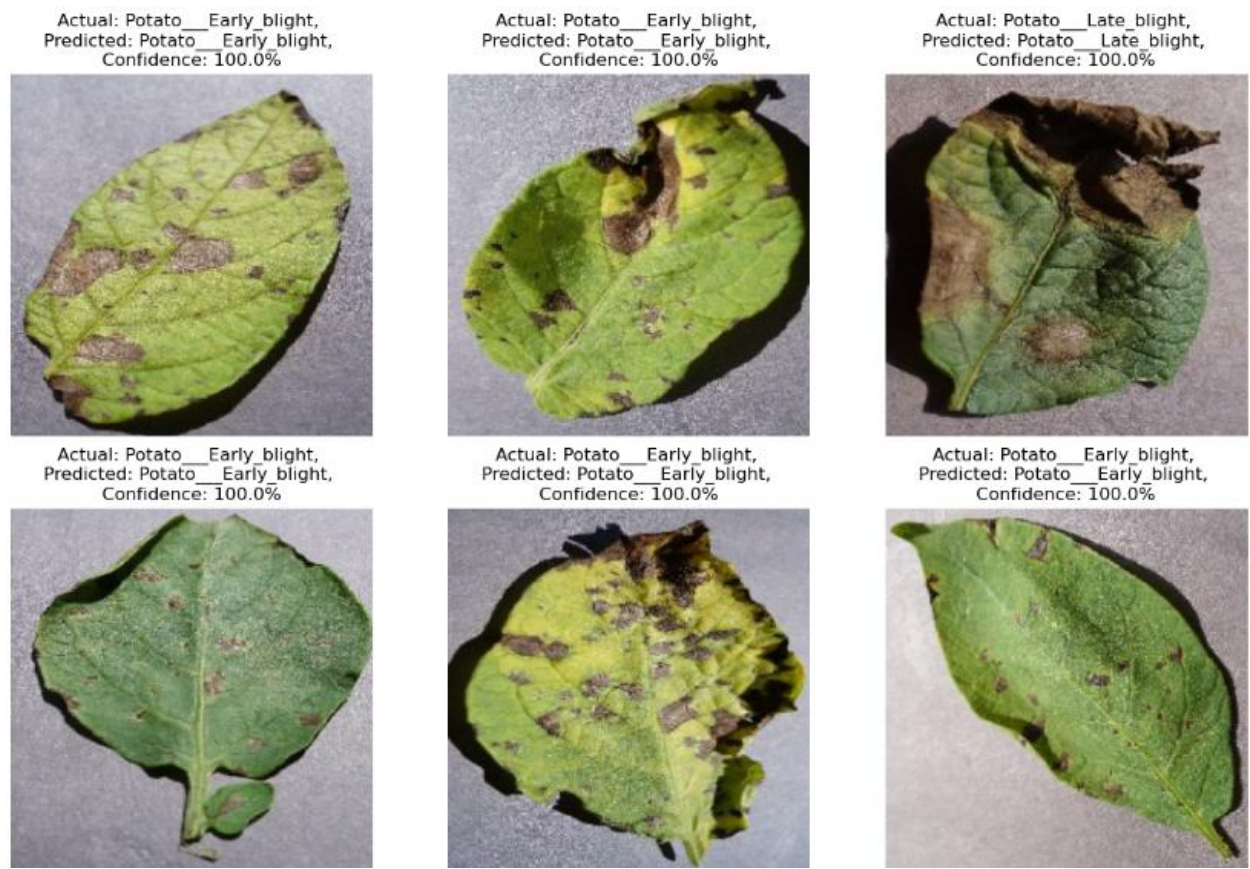


*Confusion Matrix*



Misclassification Rate: 3.23% (3.28%, 0.86%, 5.56%)

*Predictions*



## MODEL 6 – AlexNet

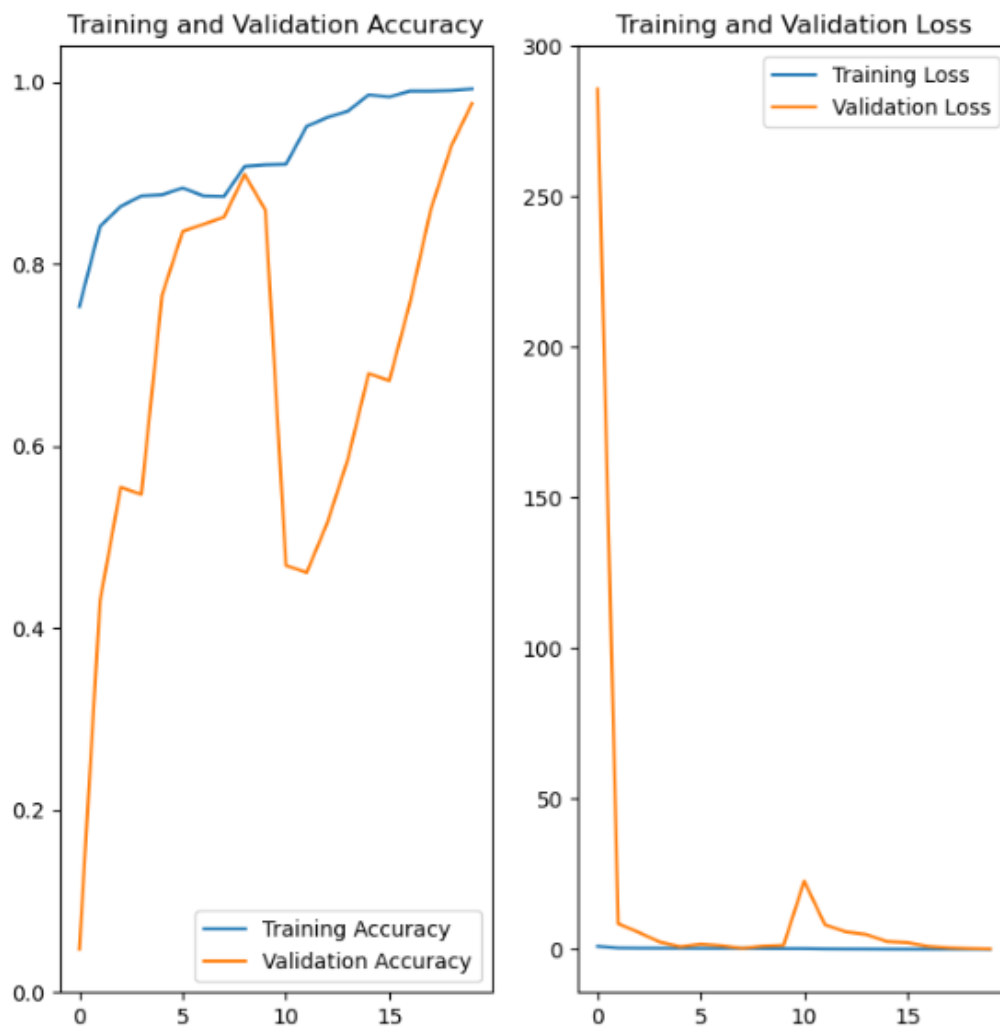
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 2152 (Early Blight: 1000, Late Blight: 1000, Healthy: 152) – 80:10:10 Split	
Train	1728
Validation	192
Test	232

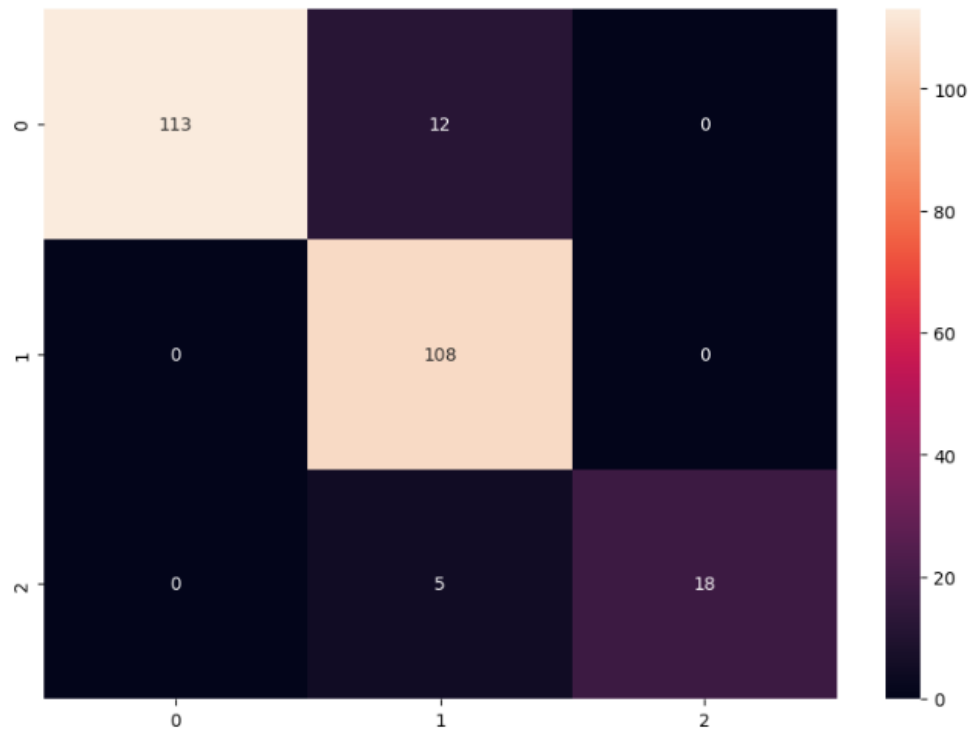
### *Model Summary*

- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 20

### *Graph*



## Confusion Matrix



Misclassification Rate: 10.45% (9.60%, 0.00%, 21.74%)

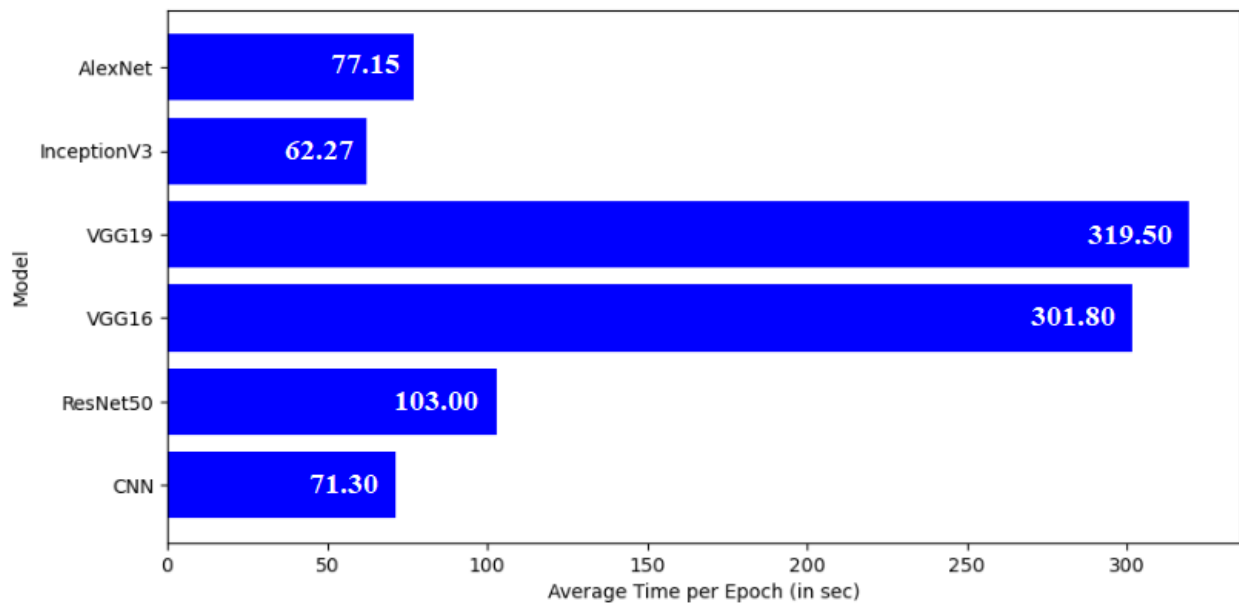
## Predictions



## COMPARISON OF BASE MODELS

### *Average Time per Epoch*

- Model 1 – CNN: 71.30 s
- Model 2 – ResNet50: 103.00 s
- Model 3 – VGG16: 301.80 s
- Model 4 – VGG19: 319.50 s
- Model 5 – InceptionV3: 62.27 s
- Model 6 – AlexNet: 77.15 s



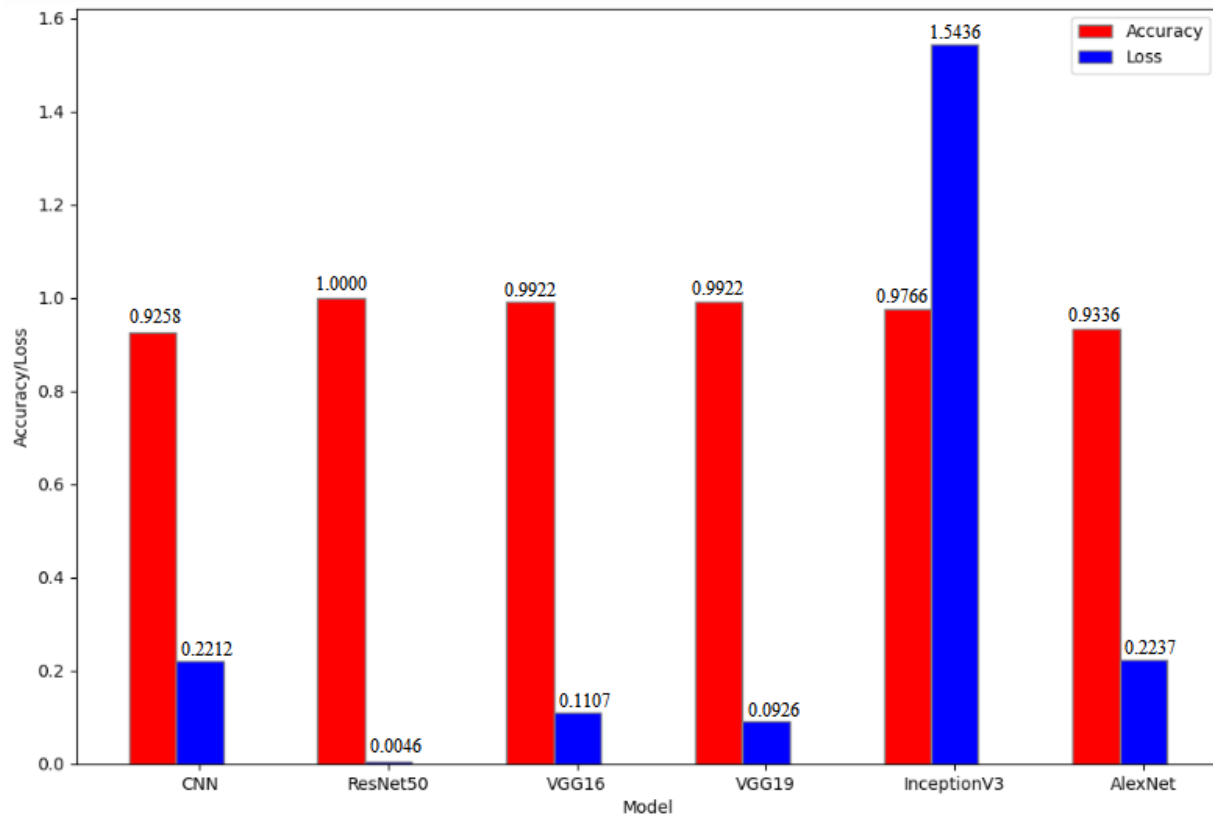
### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Model	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
CNN	0.90	1.00	0.85	0.93	1.00	0.82	1.00	0.93	0.95	0.90	0.92	0.92
ResNet50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
VGG16	0.98	1.00	1.00	0.99	1.00	0.98	1.00	0.99	0.99	0.99	1.00	0.99
VGG19	0.99	0.99	1.00	0.99	1.00	0.99	0.95	0.99	1.00	0.99	0.98	0.99
InceptionV3	0.99	0.96	1.00	0.98	0.97	0.99	0.94	0.98	0.98	0.97	0.97	0.98
AlexNet	1.00	0.86	1.00	0.94	0.90	1.00	0.78	0.93	0.95	0.93	0.88	0.93



### *Accuracy and Loss*

- Model 1 – CNN: 0.9258, 0.2212
- Model 2 – ResNet50: 1.0000, 0.0046
- Model 3 – VGG16: 0.9922, 0.1107
- Model 4 – VGG19: 0.9922, 0.0926
- Model 5 – InceptionV3: 0.9766, 1.5436
- Model 6 – AlexNet: 0.9336, 0.2237



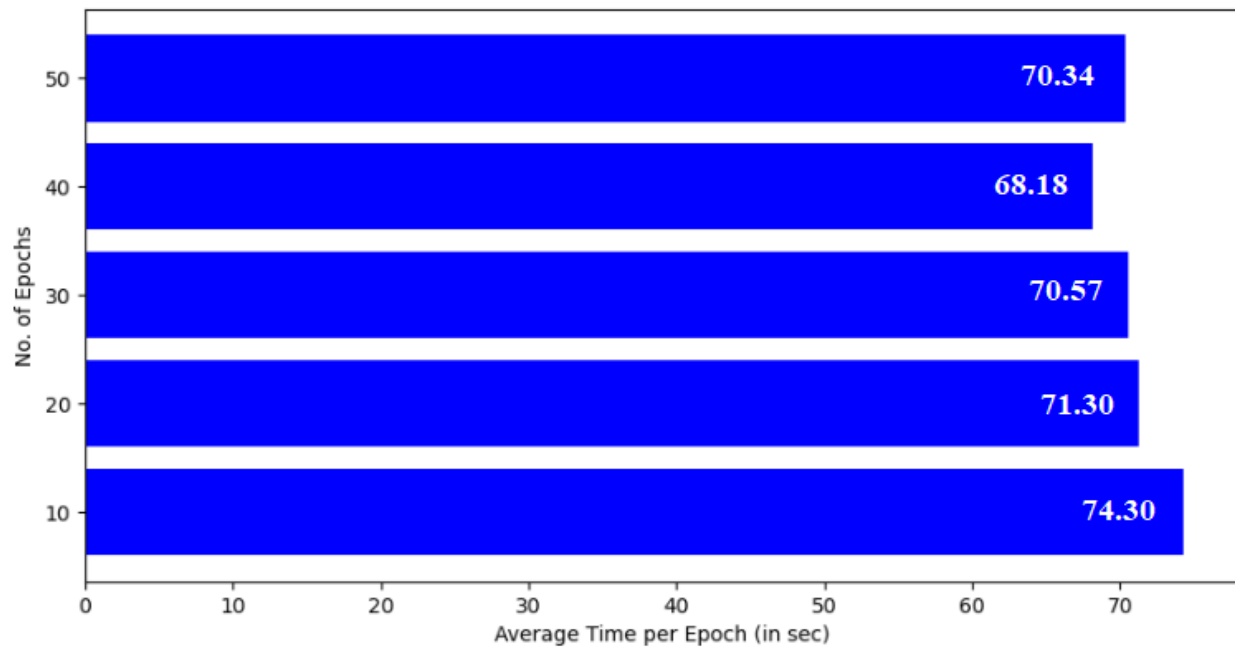
## MODEL COMPARISONS BASED ON NO. OF EPOCHS, BATCH SIZE AND DATASET SPLIT RATION

### MODEL 1: CNN

#### No. of Epochs

#### *Average Time per Epoch*

- 10: 74.30 s
- 20: 71.30 s
- 30: 70.57 s
- 40: 68.18 s
- 50: 70.34 s

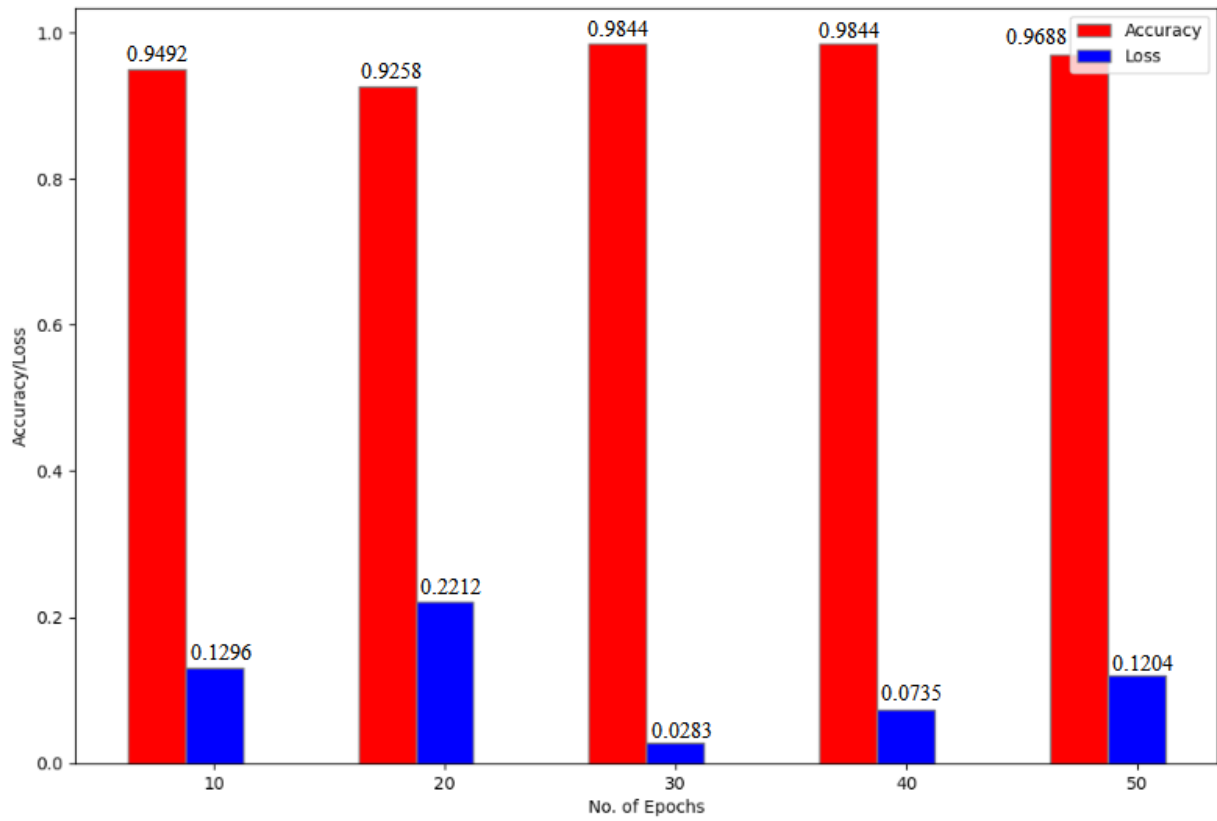


#### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
10	0.97	0.96	0.78	0.95	0.97	0.92	1.00	0.95	0.97	0.94	0.88	0.95
20	0.90	1.00	0.85	0.93	1.00	0.82	1.00	0.93	0.95	0.90	0.92	0.92
30	1.00	0.99	0.86	0.99	0.99	0.98	1.00	0.98	1.00	0.98	0.92	0.98
40	0.99	0.98	0.93	0.98	1.00	0.98	0.88	0.98	1.00	0.98	0.90	0.98
50	0.96	0.99	0.92	0.97	1.00	0.94	0.96	0.97	0.98	0.96	0.94	0.97

### *Accuracy and Loss*

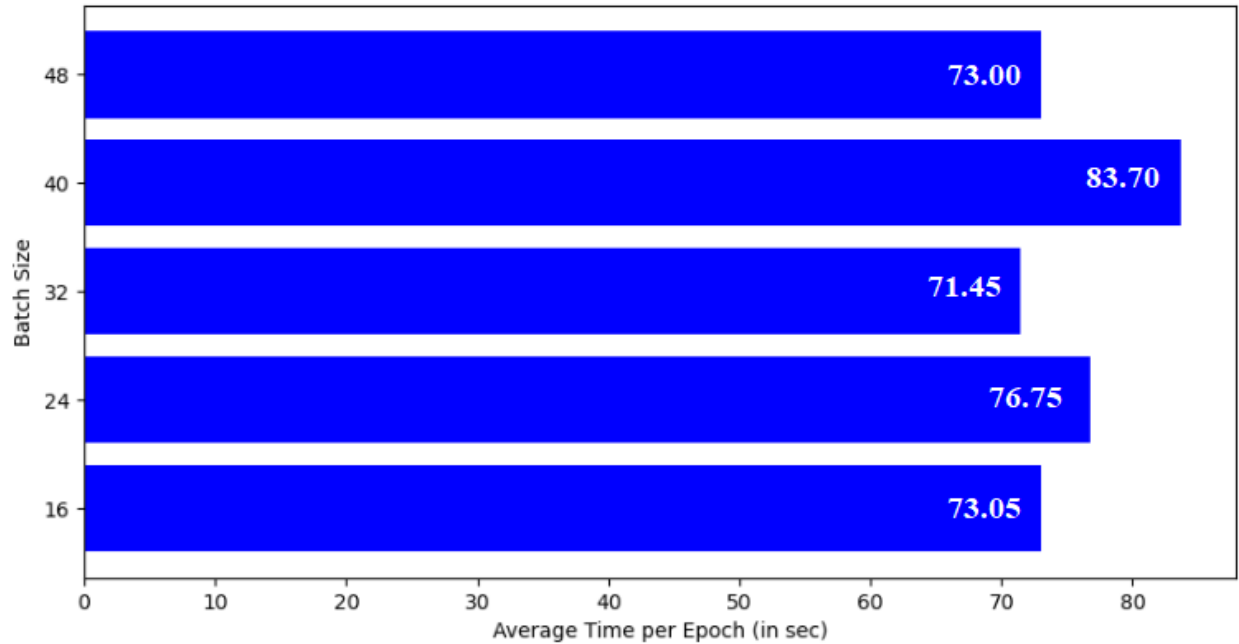
- 10: 0.9492, 0.1296
- 20: 0.9258, 0.2212
- 30: 0.9844, 0.0283
- 40: 0.9844, 0.0735
- 50: 0.9688, 0.1204



## Batch Size

### *Average Time per Epoch*

- 16: 73.05 s
- 24: 76.75 s
- 32: 71.45 s
- 40: 83.70 s
- 48: 73.00 s

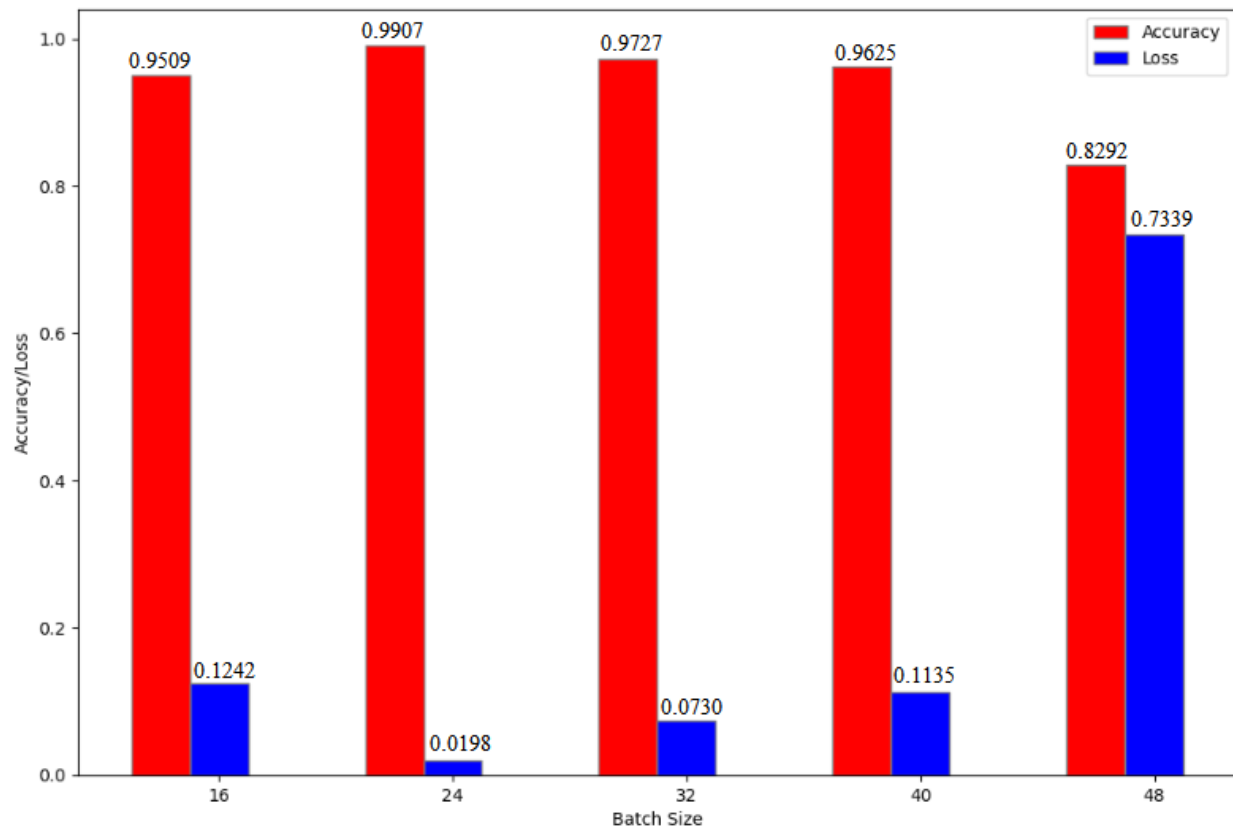


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Batch Size	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
16	0.95	0.98	0.67	0.95	0.99	0.91	0.86	0.95	0.97	0.94	0.75	0.95
24	0.99	0.99	1.00	0.99	1.00	0.99	0.90	0.99	1.00	0.99	0.95	0.99
32	0.97	0.99	0.86	0.97	1.00	0.95	0.92	0.97	0.98	0.97	0.89	0.97
40	0.97	1.00	0.74	0.97	1.00	0.92	1.00	0.96	0.99	0.96	0.85	0.96
48	0.72	1.00	0.94	0.88	1.00	0.66	1.00	0.83	0.84	0.80	0.97	0.83

### *Accuracy and Loss*

- 16: 0.9509, 0.1242
- 24: 0.9907, 0.0198
- 32: 0.9727, 0.0730
- 40: 0.9625, 0.1135
- 48: 0.8292, 0.7339

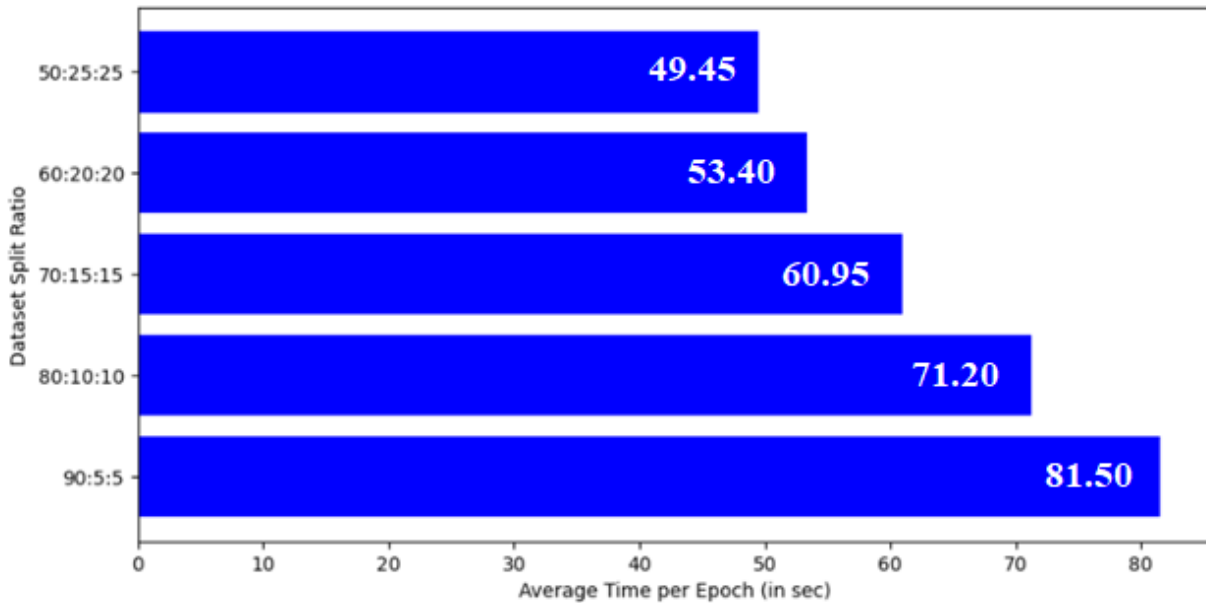




## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 81.50 s
- 80-10-10: 71.20 s
- 70-15-15: 60.95 s
- 60-20-20: 53.40 s
- 50-25-25: 49.45 s

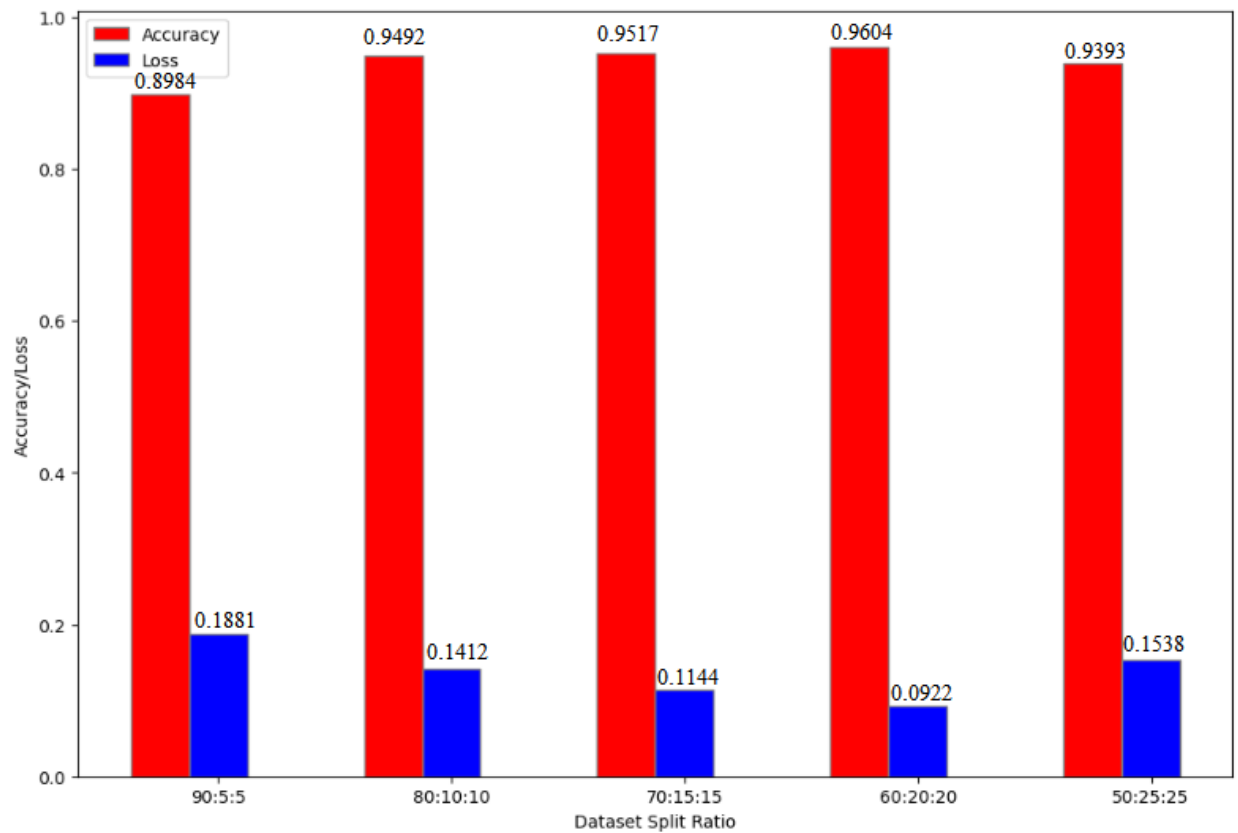


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	0.82	1.00	0.88	0.92	1.00	0.80	1.00	0.90	0.90	0.89	0.93	0.90
80:10:10	0.91	1.00	0.91	0.95	1.00	0.89	1.00	0.95	0.95	0.94	0.95	0.95
70:15:15	0.92	0.99	0.93	0.95	1.00	0.90	0.96	0.95	0.96	0.95	0.94	0.95
60:20:20	0.98	0.97	0.82	0.96	0.97	0.95	0.94	0.96	0.98	0.96	0.87	0.96
50:25:25	1.00	0.89	0.92	0.94	0.89	0.99	0.95	0.94	0.94	0.94	0.93	0.94

### *Accuracy and Loss*

- 90-5-5: 0.8984, 0.1881
- 80-10-10: 0.9492, 0.1412
- 70-15-15: 0.9517, 0.1144
- 60-20-20: 0.9604, 0.0922
- 50-25-25: 0.9393, 0.1538

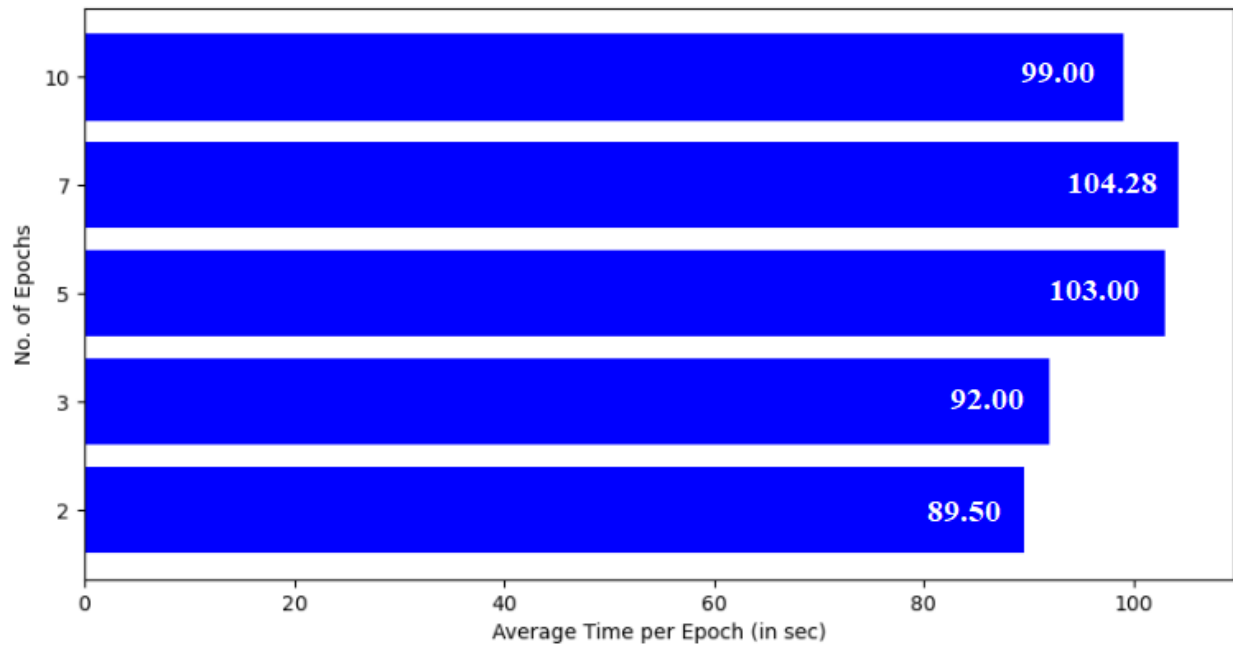


## MODEL 2: ResNet50

### No. of Epochs

#### *Average Time per Epoch*

- 2: 89.50 s
- 3: 92.00 s
- 5: 103.00 s
- 7: 104.28 s
- 10: 99.00 s

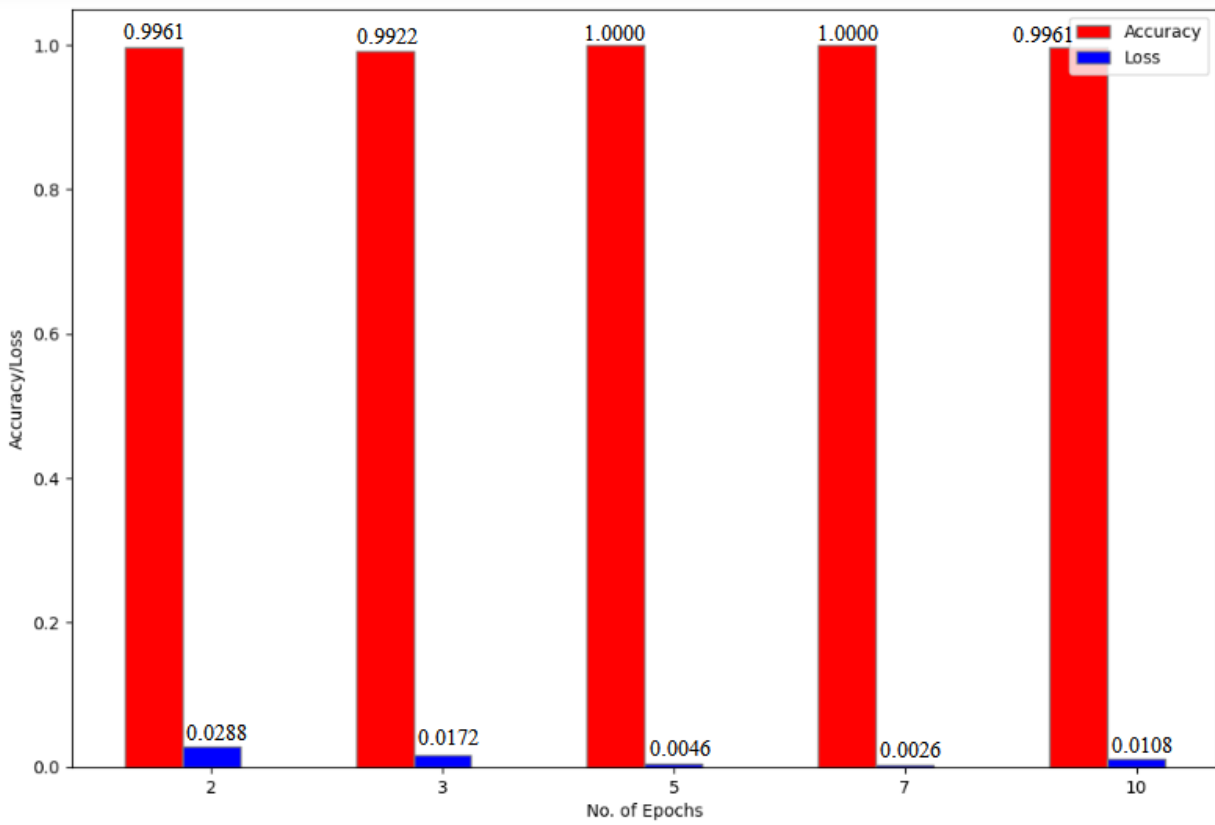


#### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
2	0.99	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
3	1.00	1.00	0.92	0.99	1.00	0.98	1.00	0.99	1.00	0.99	0.96	0.99
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	0.95	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.97	1.00

### *Accuracy and Loss*

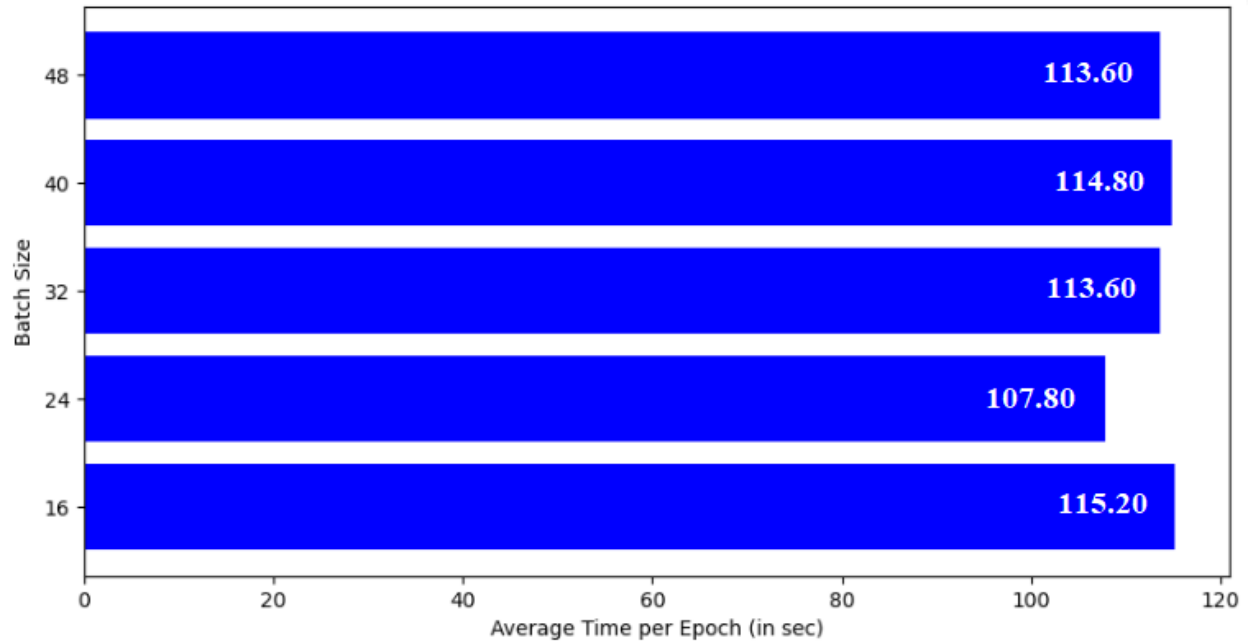
- 2: 0.9961, 0.0288
- 3: 0.9922, 0.0172
- 5: 1.0000, 0.0046
- 7: 1.0000, 0.0026
- 10: 0.9961, 0.0108



## Batch Size

### *Average Time per Epoch*

- 16: 115.20 s
- 24: 107.80 s
- 32: 113.60 s
- 40: 114.80 s
- 48: 113.60 s



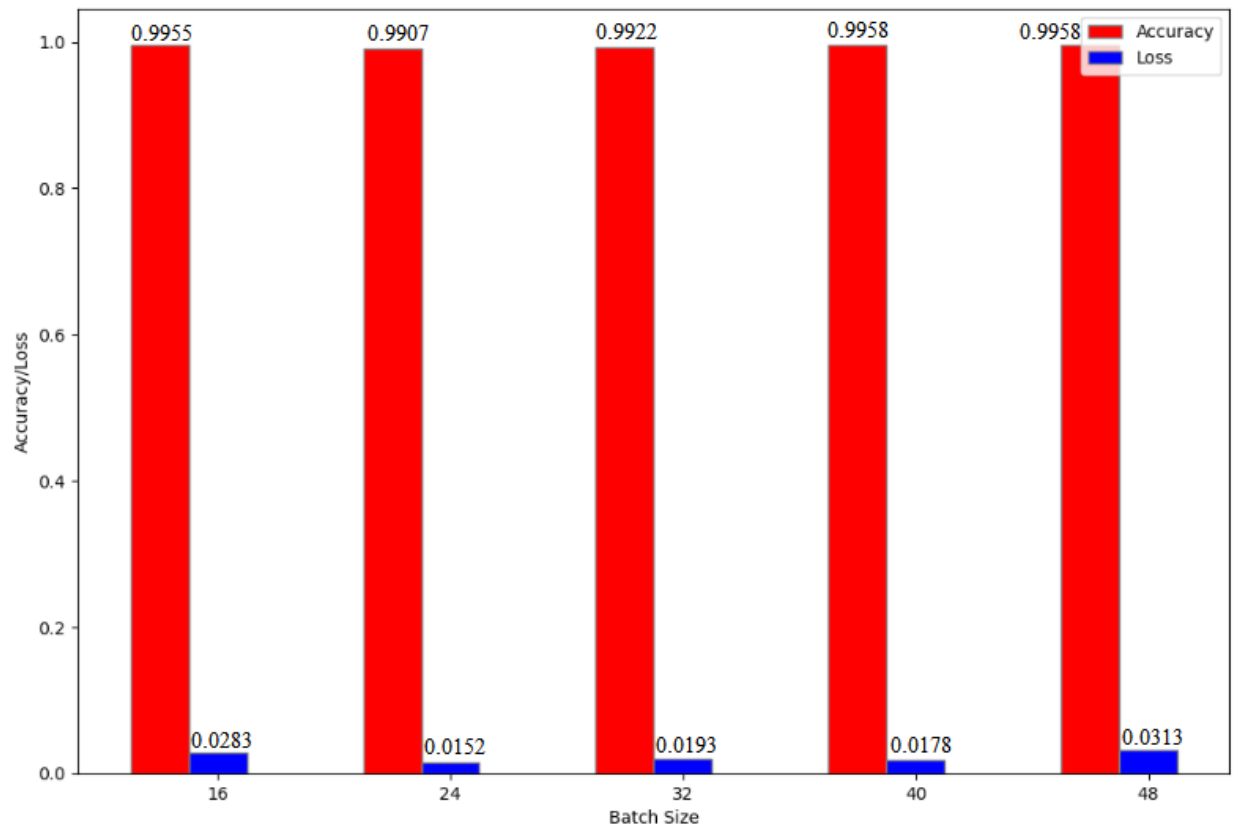
### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Batch Size	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
16	0.99	1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
24	0.99	0.99	1.00	0.99	1.00	0.99	0.93	0.99	1.00	0.99	0.97	0.99
32	0.98	1.00	1.00	0.99	1.00	0.98	1.00	0.99	0.99	0.99	1.00	0.99
40	1.00	0.99	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.00	0.97	1.00
48	1.00	0.99	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.00	0.97	1.00



### *Accuracy and Loss*

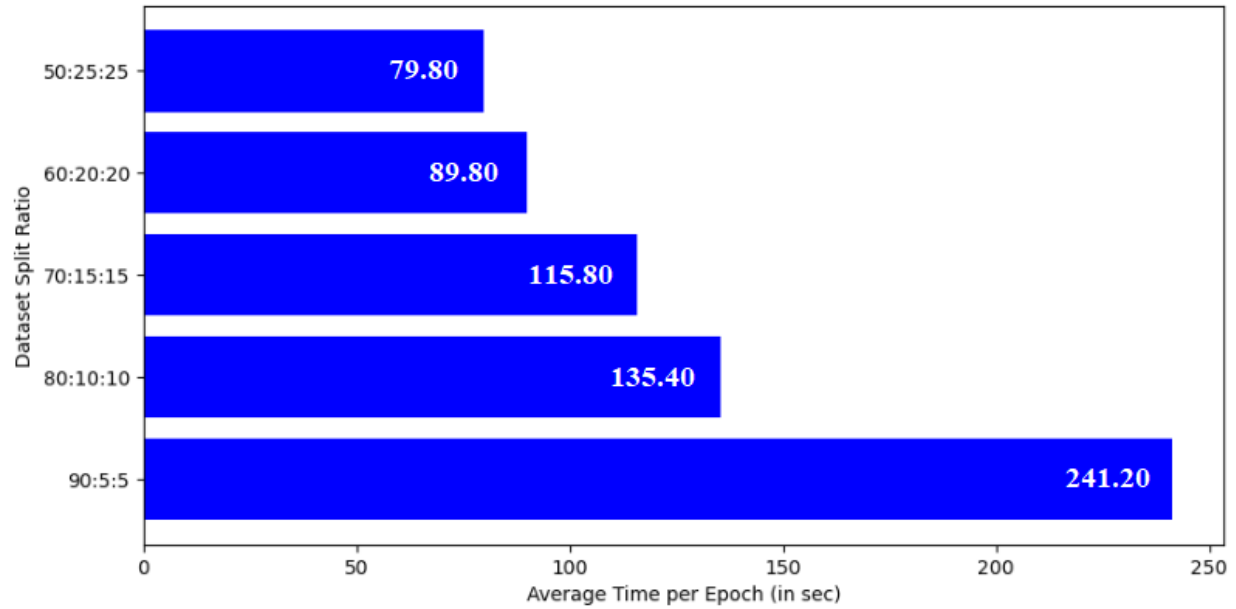
- 16: 0.9955, 0.0283
- 24: 0.9907, 0.0152
- 32: 0.9922, 0.0193
- 40: 0.9958, 0.0178
- 48: 0.9958, 0.0313



## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 241.20 s
- 80-10-10: 135.40 s
- 70-15-15: 115.80 s
- 60-20-20: 89.80 s
- 50-25-25: 79.80 s

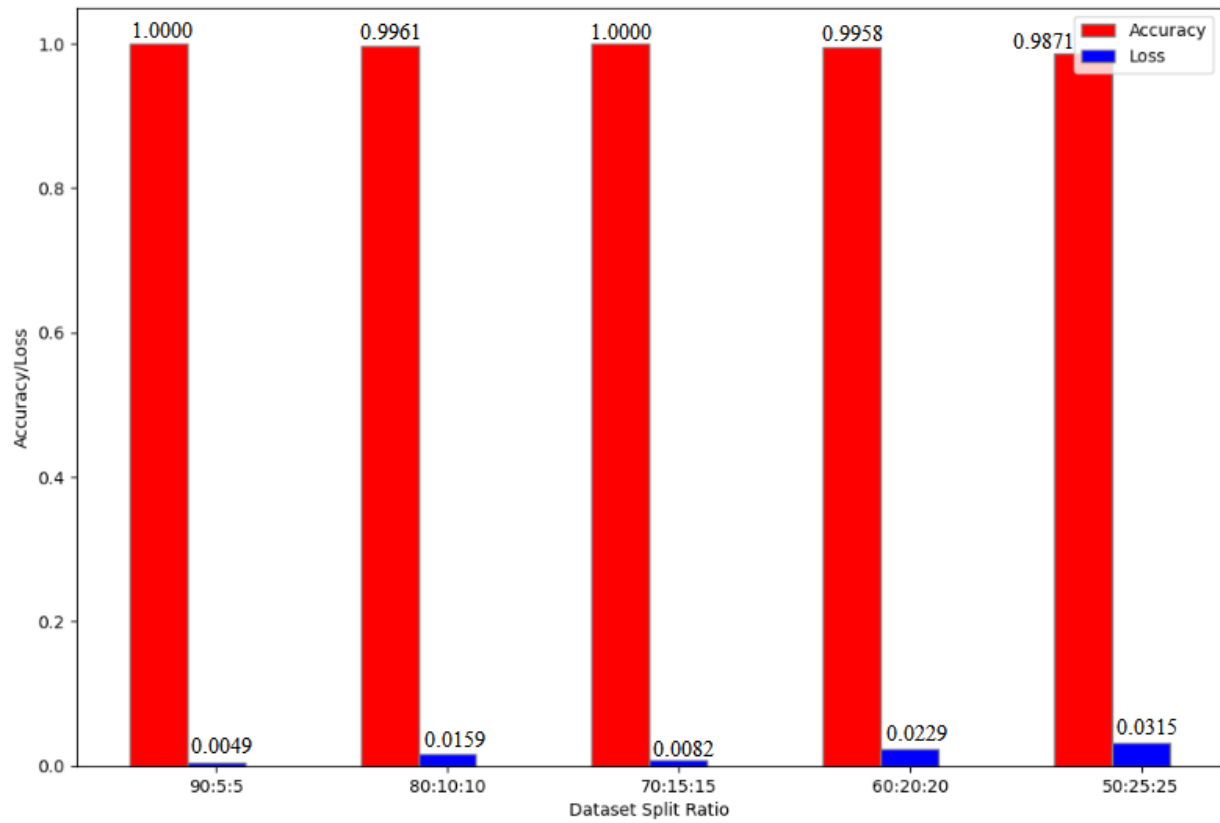


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80:10:10	1.00	0.99	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00
70:15:15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
60:20:20	1.00	0.99	1.00	1.00	1.00	1.00	0.96	1.00	1.00	1.00	0.98	1.00
50:25:25	0.99	0.98	1.00	0.99	0.99	0.99	0.94	0.99	0.99	0.99	0.97	0.99

### *Accuracy and Loss*

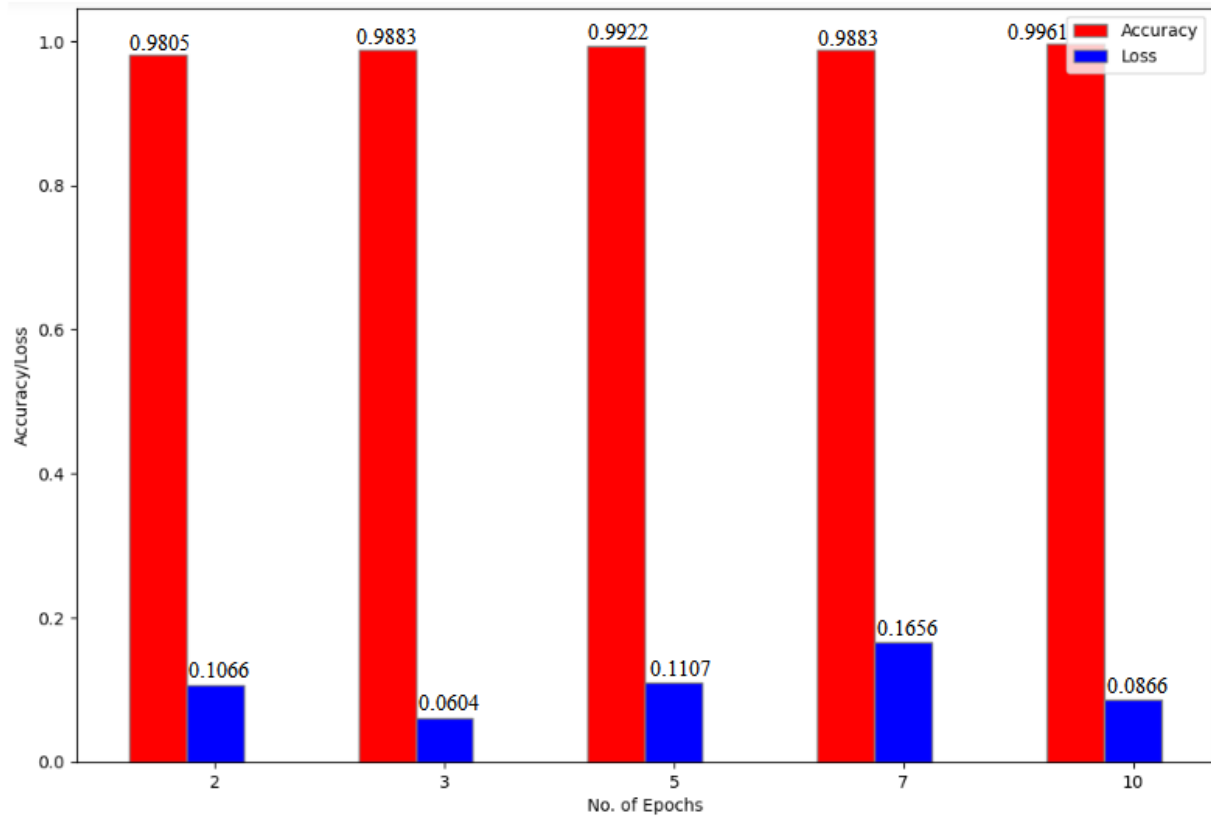
- 90-5-5: 1.0000, 0.0049
- 80-10-10: 0.9961, 0.0159
- 70-15-15: 1.0000, 0.0082
- 60-20-20: 0.9958, 0.0229
- 50-25-25: 0.9871, 0.0315



[illegible]

### *Accuracy and Loss*

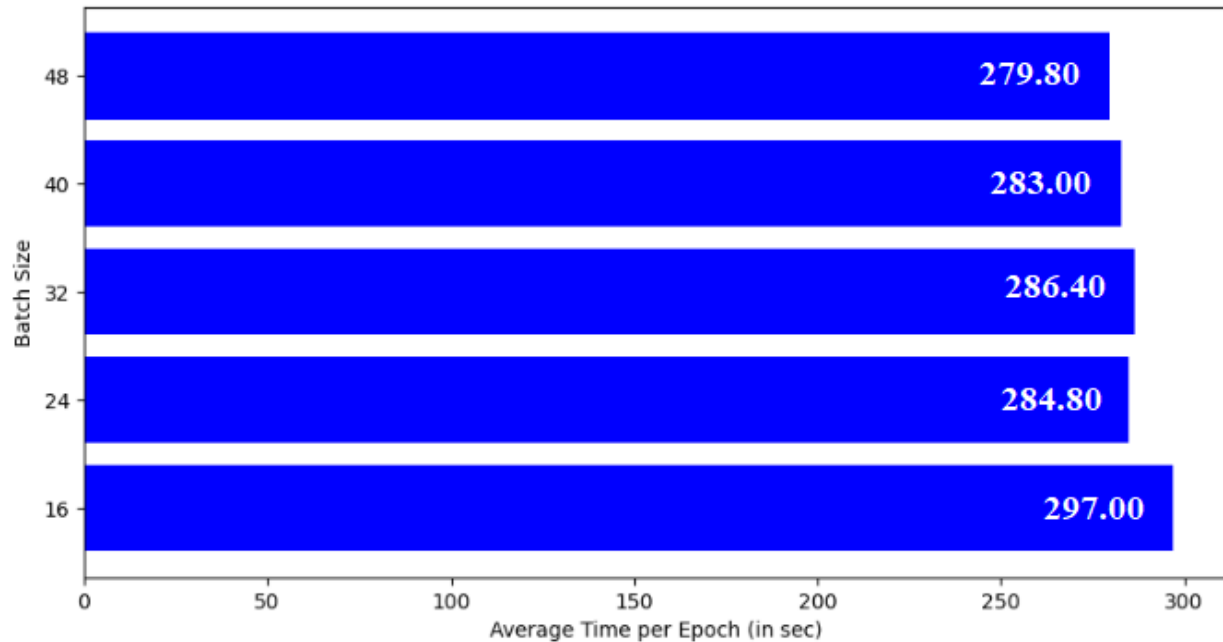
- 2: 0.9805, 0.1066
- 3: 0.9883, 0.0604
- 5: 0.9922, 0.1107
- 7: 0.9883, 0.1656
- 10: 0.9961, 0.0866





### Average Time per Epoch

- 16: 297.00 s
- 24: 284.80 s
- 32: 286.40 s
- 40: 283.00 s
- 48: 279.80 s

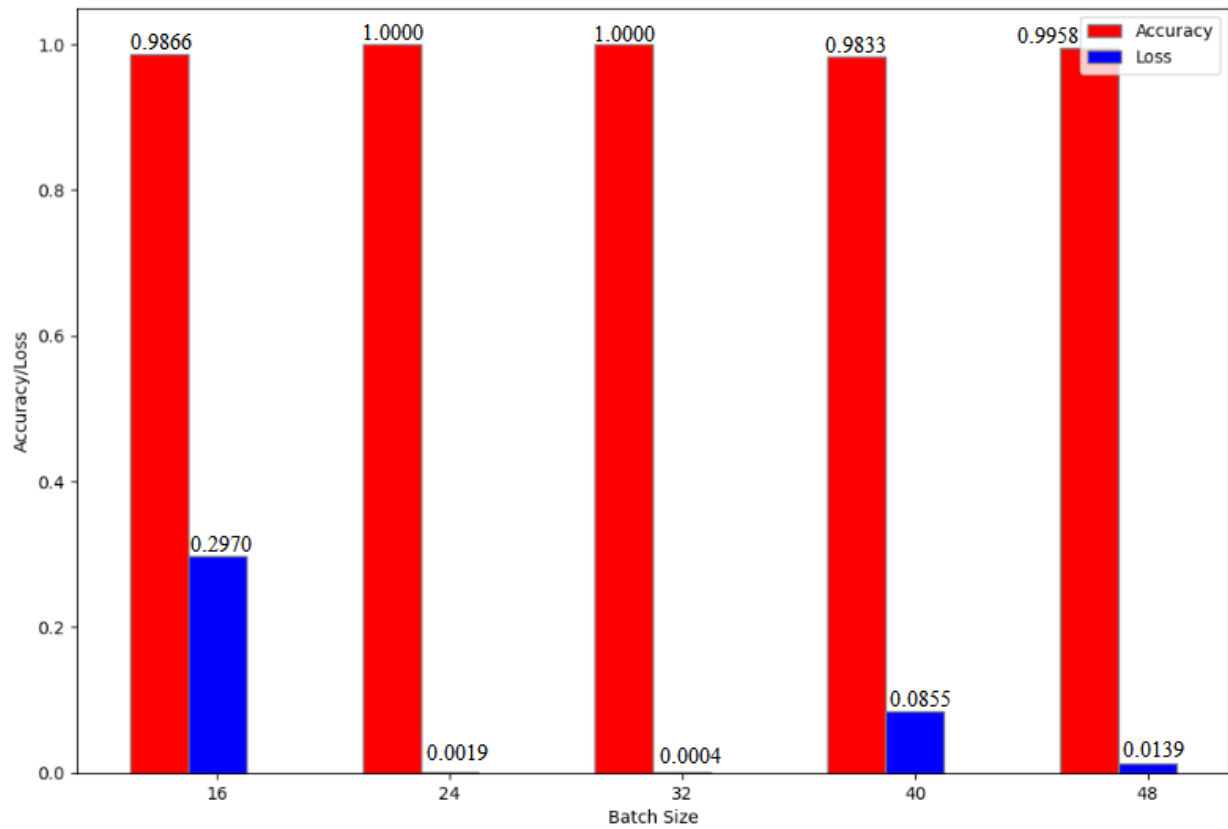


**Precision, Recall, f1 Score** (0: Early Blight, 1: Late Blight, 2: Healthy)

[illegible]

### *Accuracy and Loss*

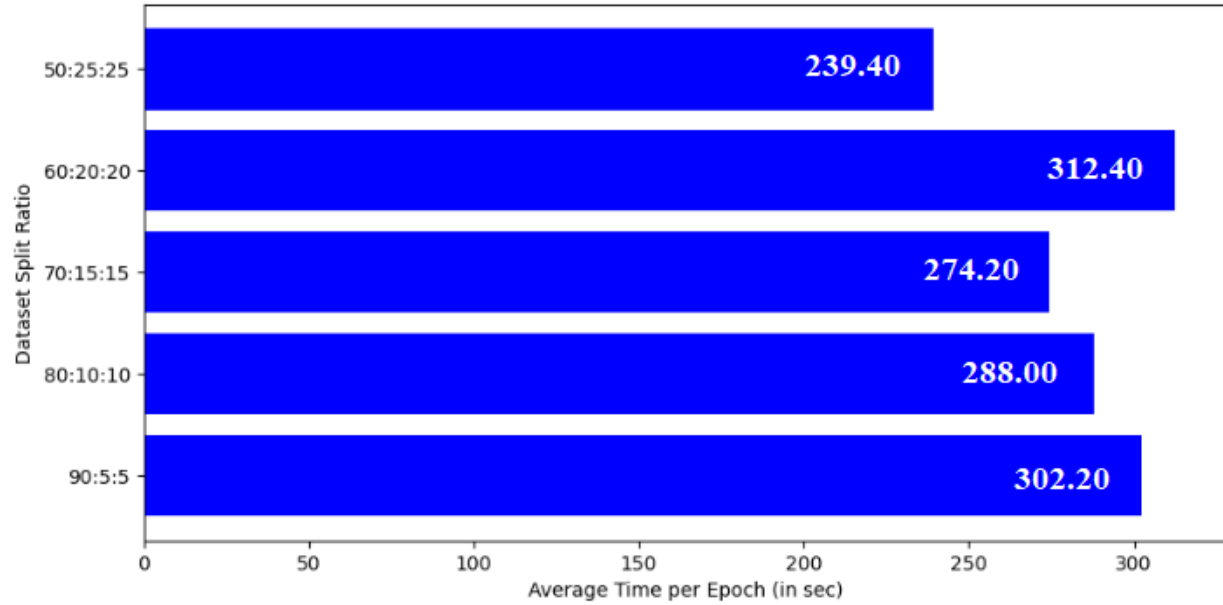
- 16: 0.9866, 0.2970
- 24: 1.0000, 0.0019
- 32: 1.0000, 0.0004
- 40: 0.9833, 0.0855
- 48: 0.9958, 0.0139



## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 302.20 s
- 80-10-10: 288.00 s
- 70-15-15: 274.20 s
- 60-20-20: 312.40 s
- 50-25-25: 239.40 s

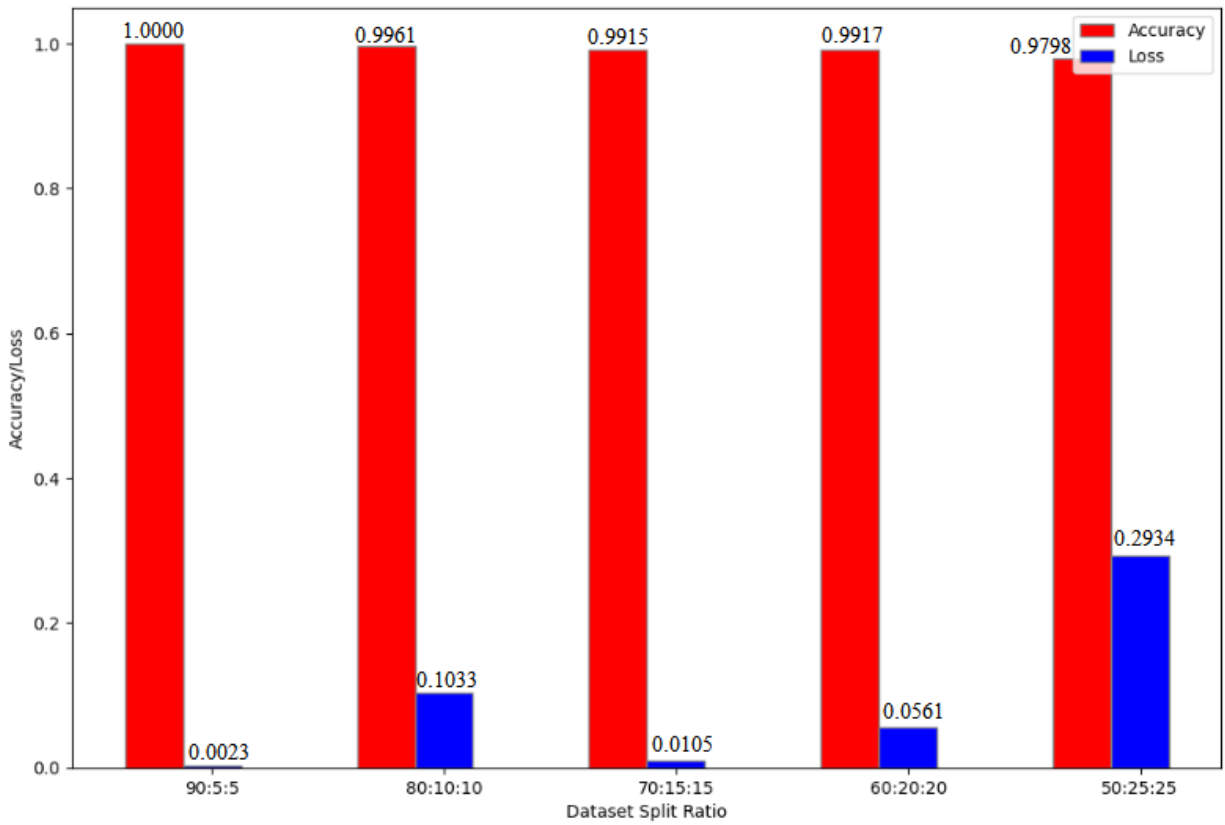


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80:10:10	1.00	0.99	1.00	1.00	1.00	1.00	0.96	1.00	1.00	1.00	0.98	1.00
70:15:15	0.99	0.99	1.00	0.99	0.99	0.99	1.00	0.99	0.99	0.99	1.00	0.99
60:20:20	0.99	0.99	1.00	0.99	1.00	0.99	0.96	0.99	1.00	0.99	0.98	0.99
50:25:25	0.98	0.98	0.94	0.98	1.00	0.98	0.89	0.98	0.99	0.98	0.92	0.98

### *Accuracy and Loss*

- 90-5-5: 1.0000, 0.0023
- 80-10-10: 0.9961, 0.1033
- 70-15-15: 0.9915, 0.0105
- 60-20-20: 0.9917, 0.0561
- 50-25-25: 0.9798, 0.2934

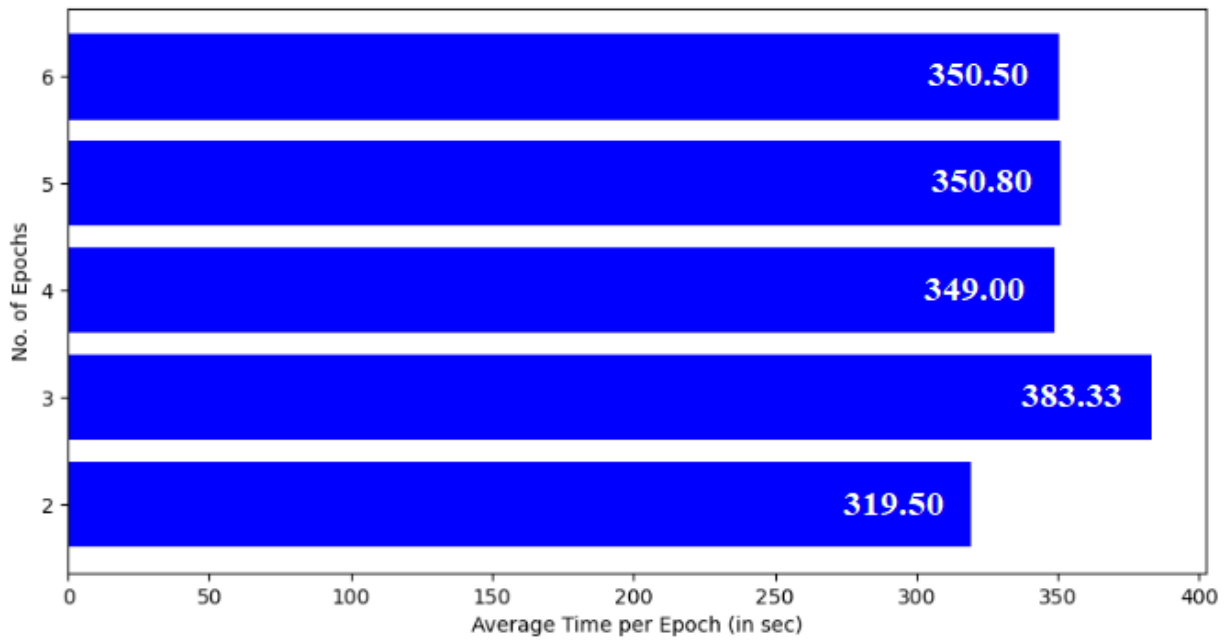


## MODEL 4: VGG19

### No. of Epochs

#### *Average Time per Epoch*

- 2: 319.50 s
- 3: 383.33 s
- 4: 349.00 s
- 5: 350.80 s
- 6: 350.50 s

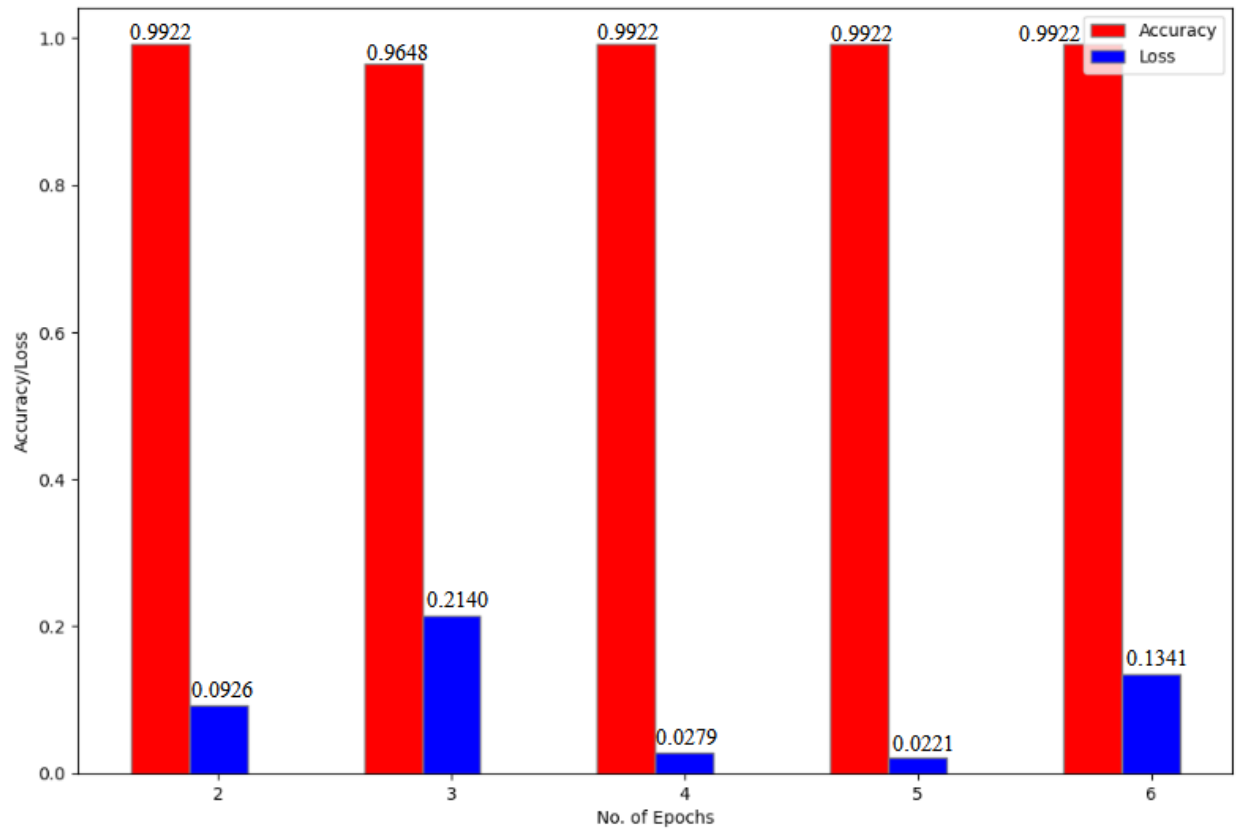


#### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
2	0.99	0.99	1.00	0.99	1.00	0.99	0.95	0.99	1.00	0.99	0.98	0.99
3	0.98	0.95	1.00	0.97	1.00	0.97	0.62	0.96	0.99	0.96	0.77	0.96
4	1.00	0.98	1.00	0.99	0.99	1.00	0.93	0.99	1.00	0.99	0.96	0.99
5	1.00	0.98	1.00	0.99	0.99	1.00	0.95	0.99	1.00	0.99	0.97	0.99
6	1.00	0.98	1.00	0.99	1.00	1.00	0.89	0.99	1.00	0.99	0.94	0.99

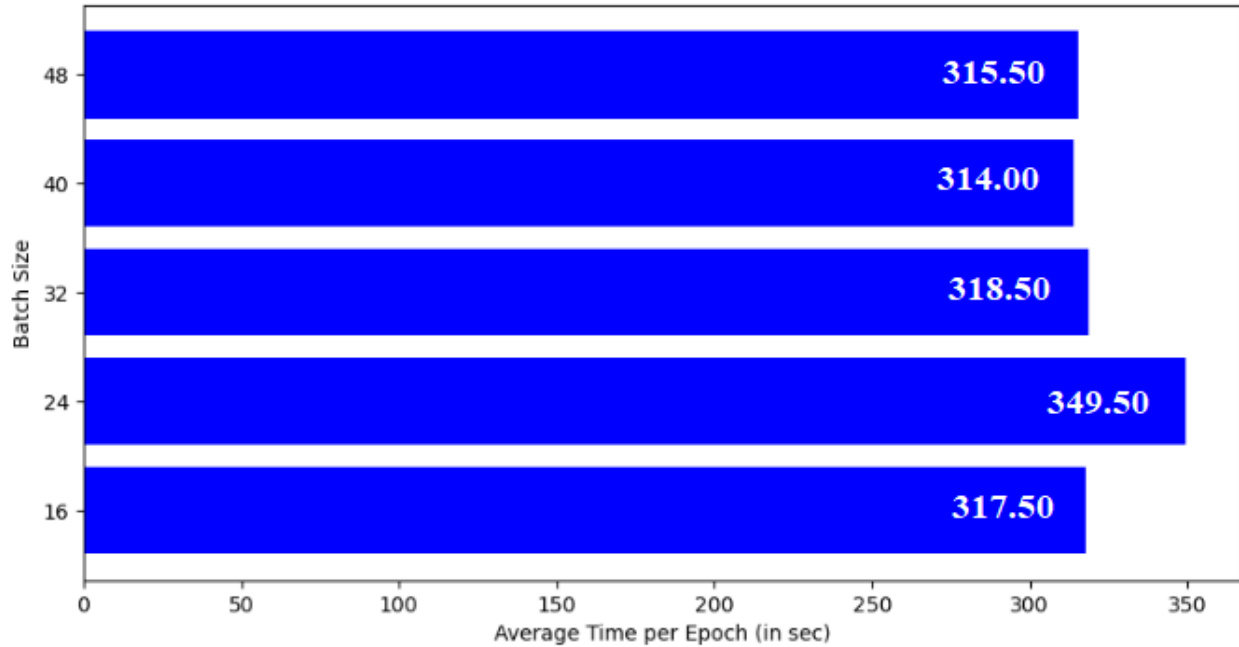
### *Accuracy and Loss*

- 2: 0.9922, 0.0926
- 3: 0.9648, 0.2140
- 4: 0.9922, 0.0279
- 5: 0.9922, 0.0221
- 6: 0.9922, 0.1341



### Average Time per Epoch

- 16: 317.50 s
- 24: 349.50 s
- 32: 318.50 s
- 40: 314.00 s
- 48: 315.50 s

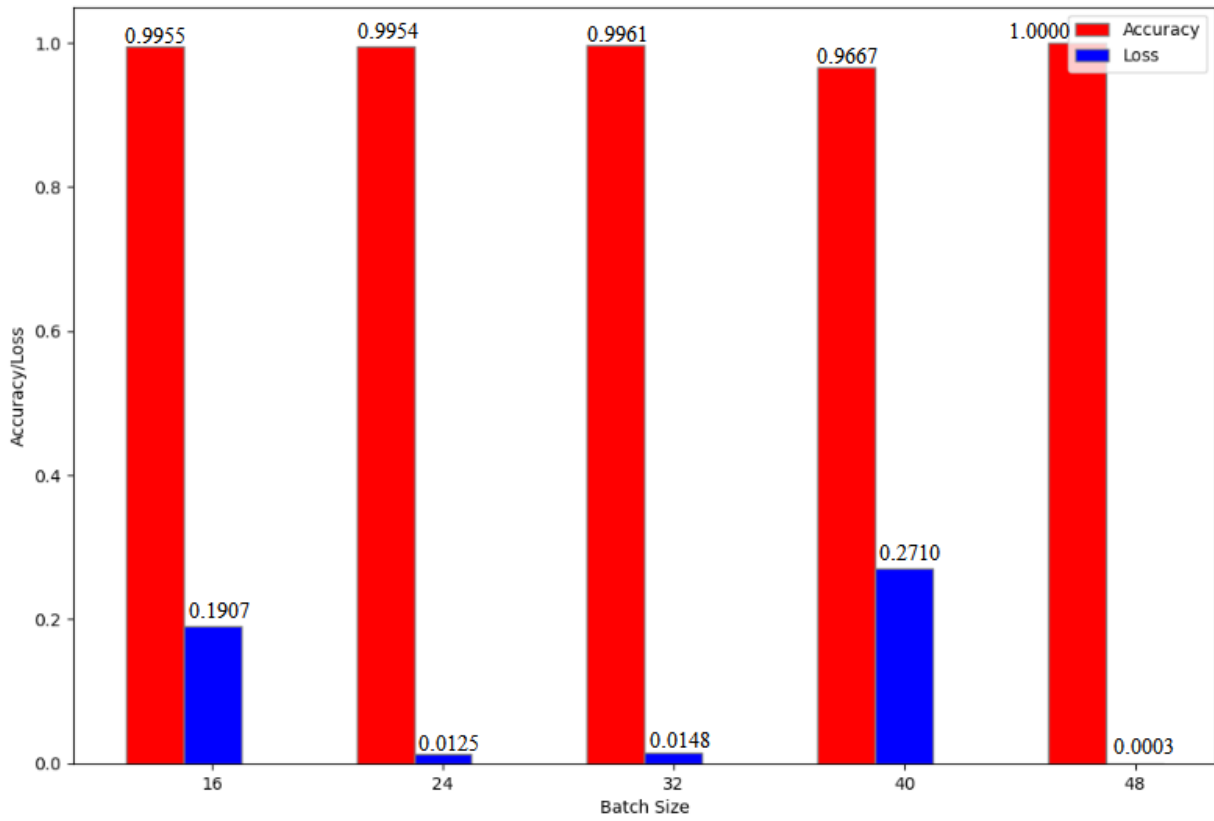


**Precision, Recall, f1 Score** (0: Early Blight, 1: Late Blight, 2: Healthy)

[illegible]

### *Accuracy and Loss*

- 16: 0.9955, 0.1907
- 24: 0.9954, 0.0125
- 32: 0.9961, 0.0148
- 40: 0.9667, 0.2710
- 48: 1.0000, 0.0003

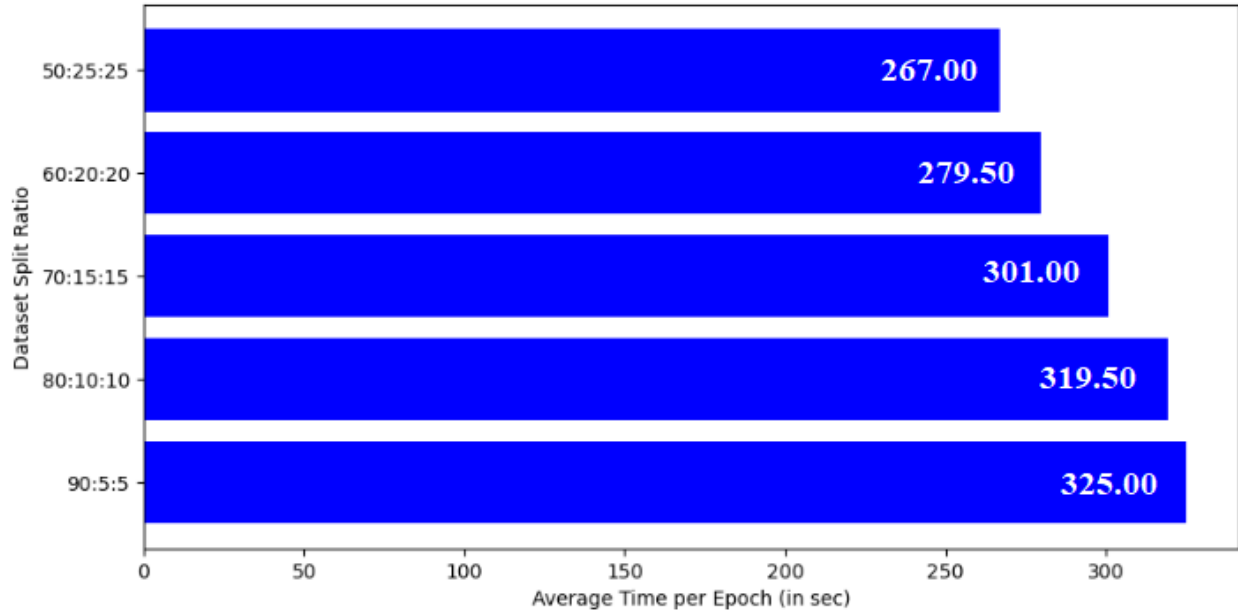




## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 325.00 s
- 80-10-10: 319.50 s
- 70-15-15: 301.00 s
- 60-20-20: 279.50 s
- 50-25-25: 267.00 s

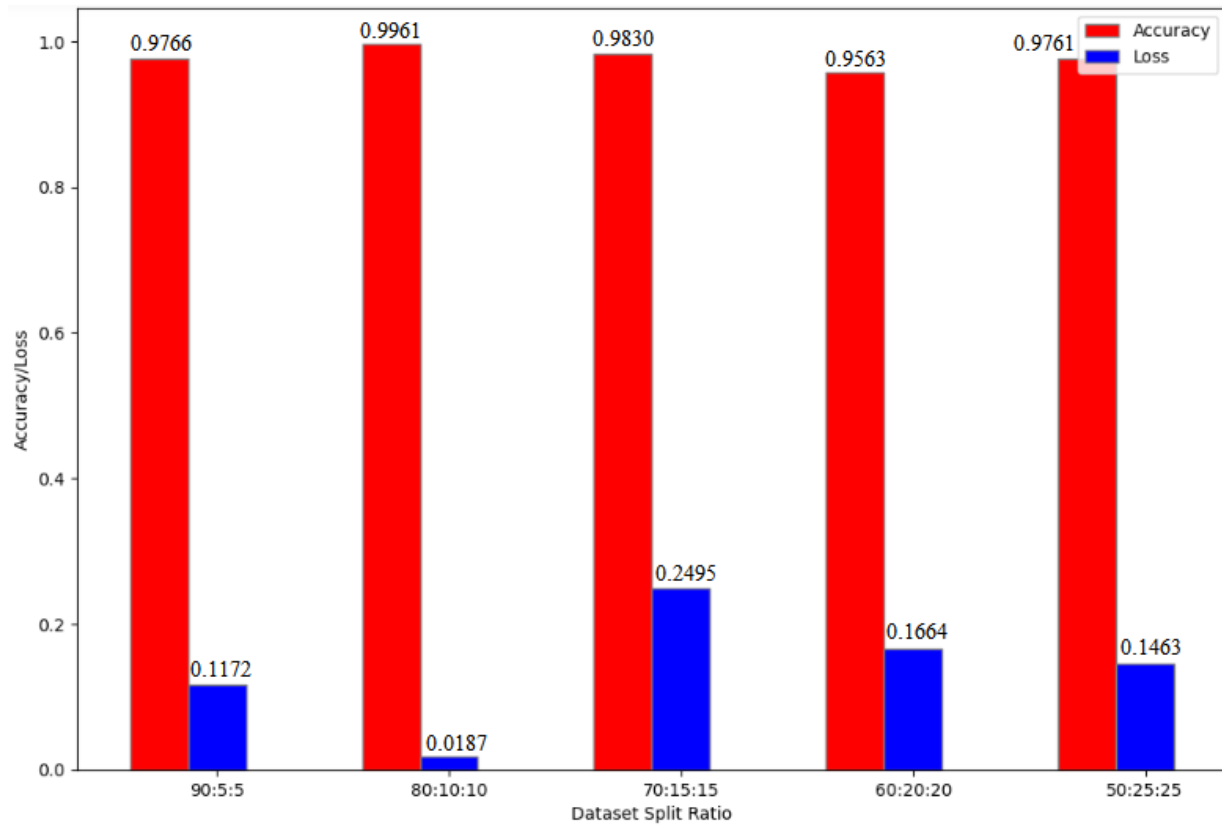


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	1.00	0.97	0.91	0.98	0.98	0.98	0.91	0.98	0.99	0.97	0.91	0.98
80:10:10	1.00	0.99	1.00	1.00	1.00	1.00	0.94	1.00	1.00	1.00	0.97	1.00
70:15:15	1.00	0.97	1.00	0.98	0.97	1.00	0.96	0.98	0.98	0.98	0.98	0.98
60:20:20	0.95	0.97	0.89	0.96	0.99	0.95	0.80	0.96	0.97	0.96	0.84	0.96
50:25:25	0.98	0.97	1.00	0.98	0.98	0.98	0.88	0.98	0.98	0.97	0.94	0.98

### *Accuracy and Loss*

- 90-5-5: 0.9766, 0.1172
- 80-10-10: 0.9961, 0.0187
- 70-15-15: 0.9830, 0.2495
- 60-20-20: 0.9563, 0.1664
- 50-25-25: 0.9761, 0.1463

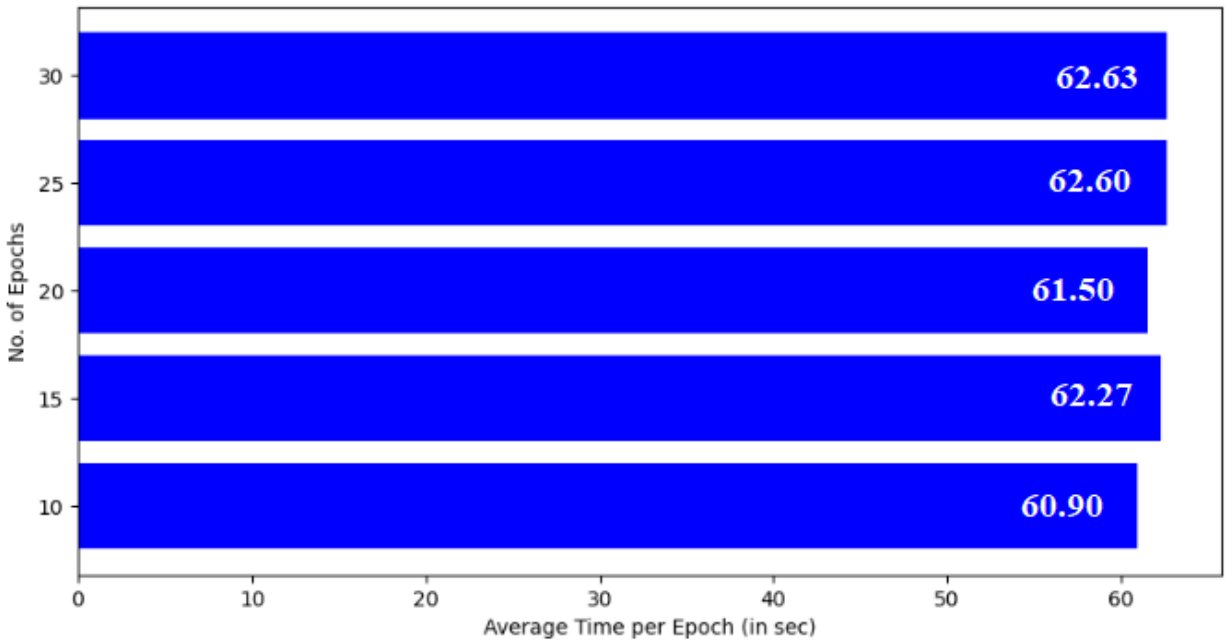


## MODEL 5: InceptionV3

### No. of Epochs

#### *Average Time per Epoch*

- 10: 60.90 s
- 15: 62.27 s
- 20: 61.50 s
- 25: 62.60 s
- 30: 62.63 s

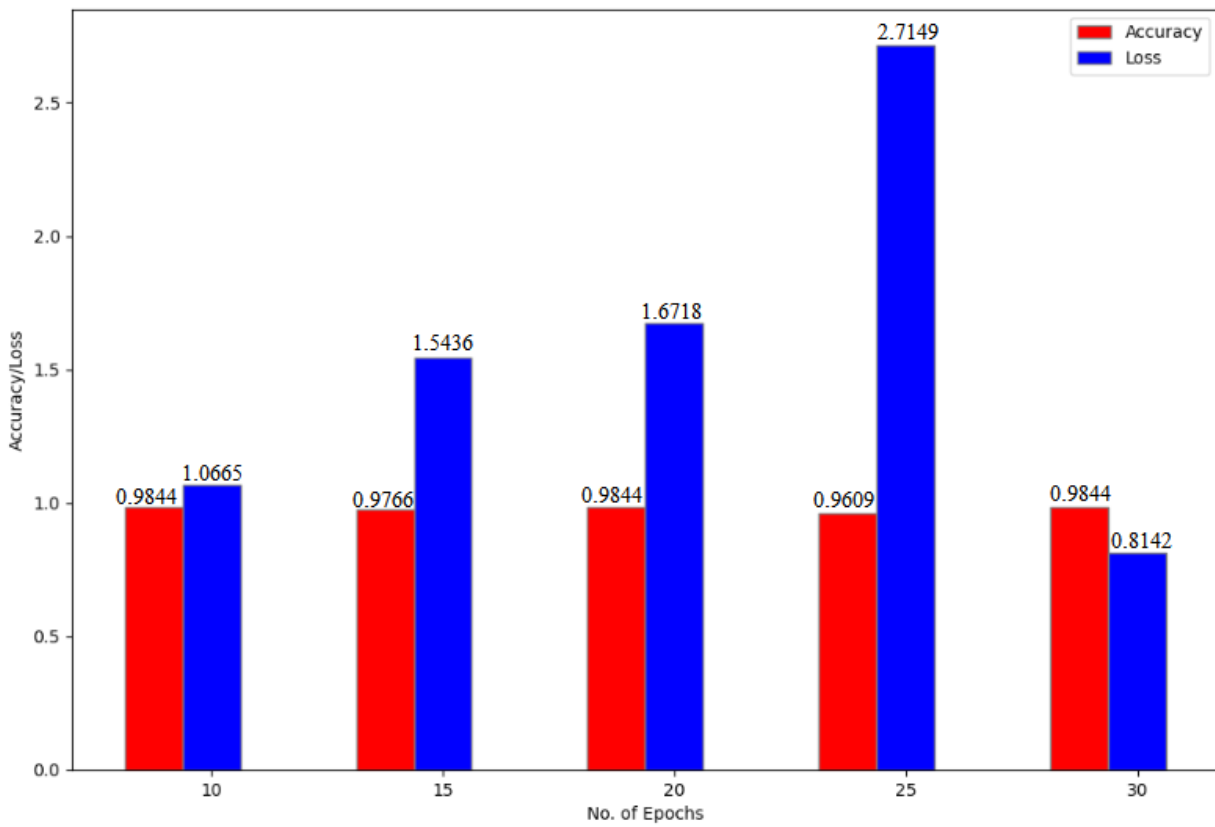


#### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
10	0.98	0.98	1.00	0.98	0.99	0.98	0.95	0.98	0.99	0.98	0.98	0.98
15	0.99	0.96	1.00	0.98	0.97	0.99	0.94	0.98	0.98	0.97	0.97	0.98
20	1.00	0.97	1.00	0.98	0.98	1.00	0.95	0.98	0.99	0.98	0.97	0.98
25	0.96	0.96	0.93	0.96	0.97	0.98	0.76	0.96	0.97	0.97	0.84	0.96
30	0.99	0.98	1.00	0.98	0.99	0.99	0.89	0.98	0.99	0.98	0.94	0.98

### *Accuracy and Loss*

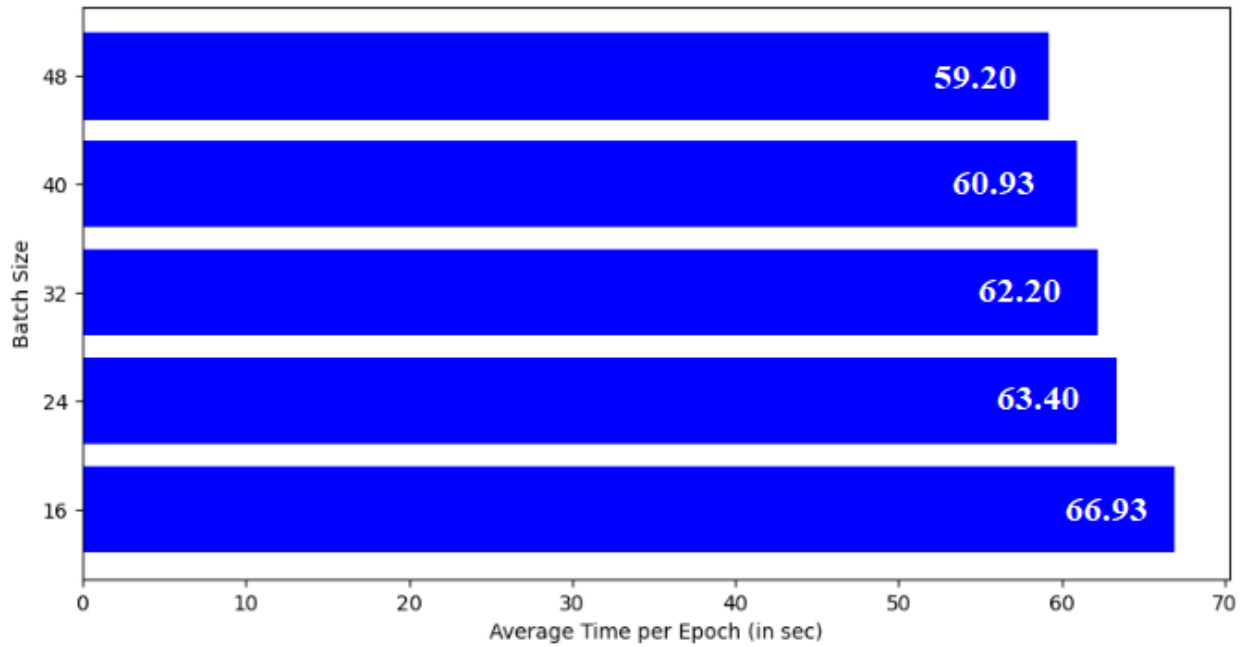
- 10: 0.9844, 1.0665
- 15: 0.9766, 1.5436
- 20: 0.9844, 1.6718
- 25: 0.9609, 2.7149
- 30: 0.9844, 0.8142



## Batch Size

### *Average Time per Epoch*

- 16: 66.93 s
- 24: 63.40 s
- 32: 62.20 s
- 40: 60.93 s
- 48: 59.20 s

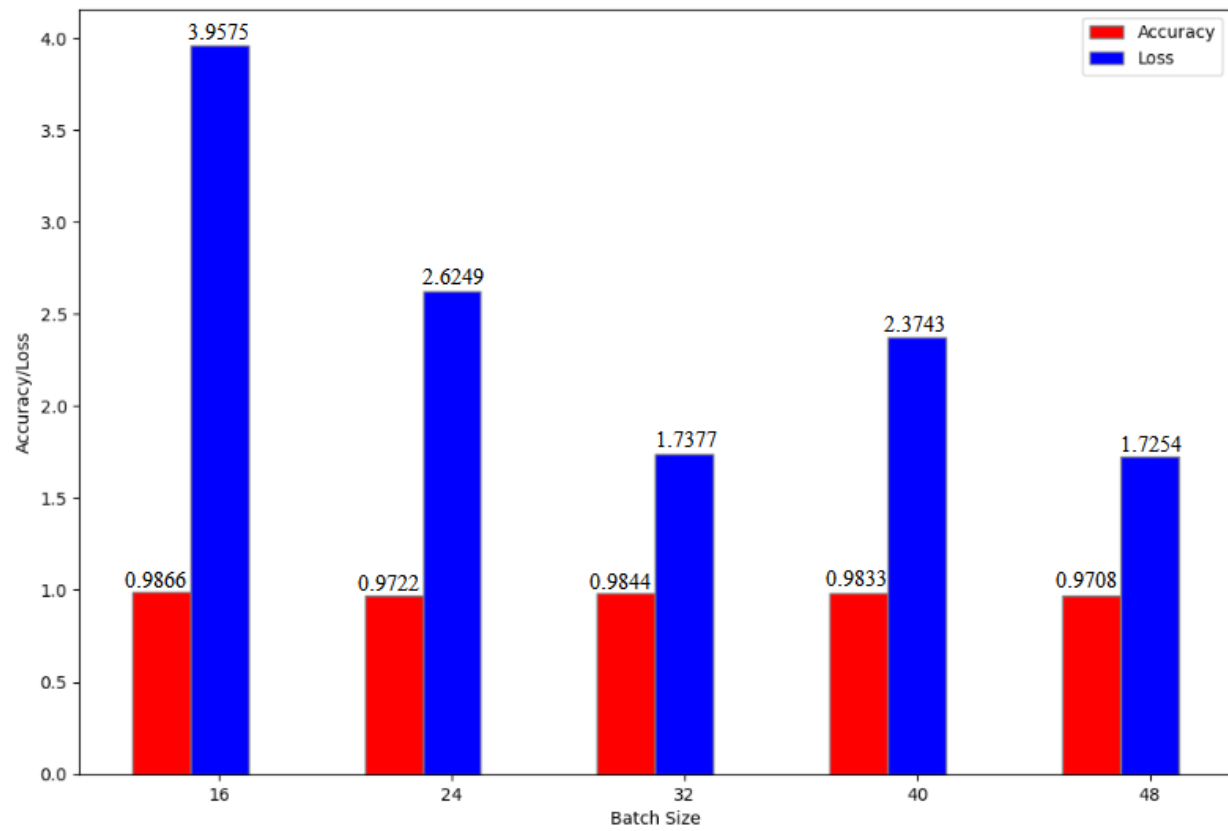


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Batch Size	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
16	0.99	0.98	1.00	0.99	0.99	0.99	0.93	0.99	0.99	0.99	0.97	0.99
24	0.98	0.96	1.00	0.97	0.98	0.99	0.86	0.97	0.98	0.98	0.93	0.97
32	0.98	0.99	0.95	0.98	0.99	0.97	1.00	0.98	0.99	0.98	0.97	0.98
40	1.00	0.97	0.95	0.98	1.00	0.99	0.88	0.98	1.00	0.98	0.91	0.98
48	0.97	0.97	0.93	0.97	0.97	0.97	0.93	0.97	0.97	0.97	0.93	0.97

### *Accuracy and Loss*

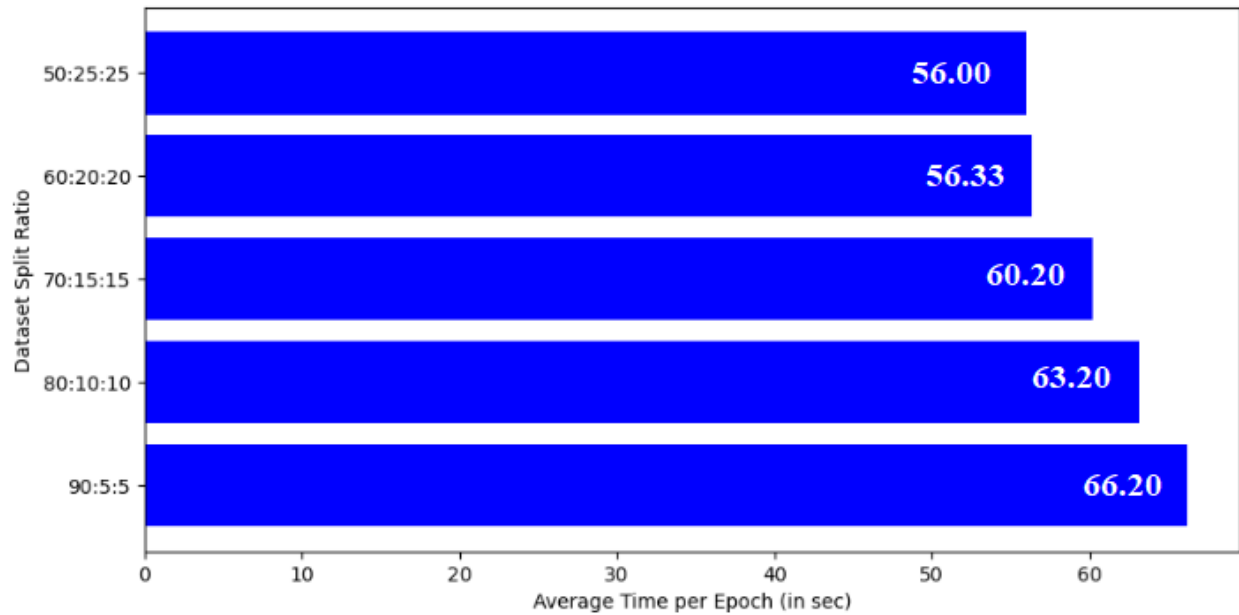
- 16: 0.9866, 3.9575
- 24: 0.9722, 2.6249
- 32: 0.9844, 1.7377
- 40: 0.9833, 2.3743
- 48: 0.9708, 1.7254



## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 66.20 s
- 80-10-10: 63.20 s
- 70-15-15: 60.20 s
- 60-20-20: 56.33 s
- 50-25-25: 56.00 s

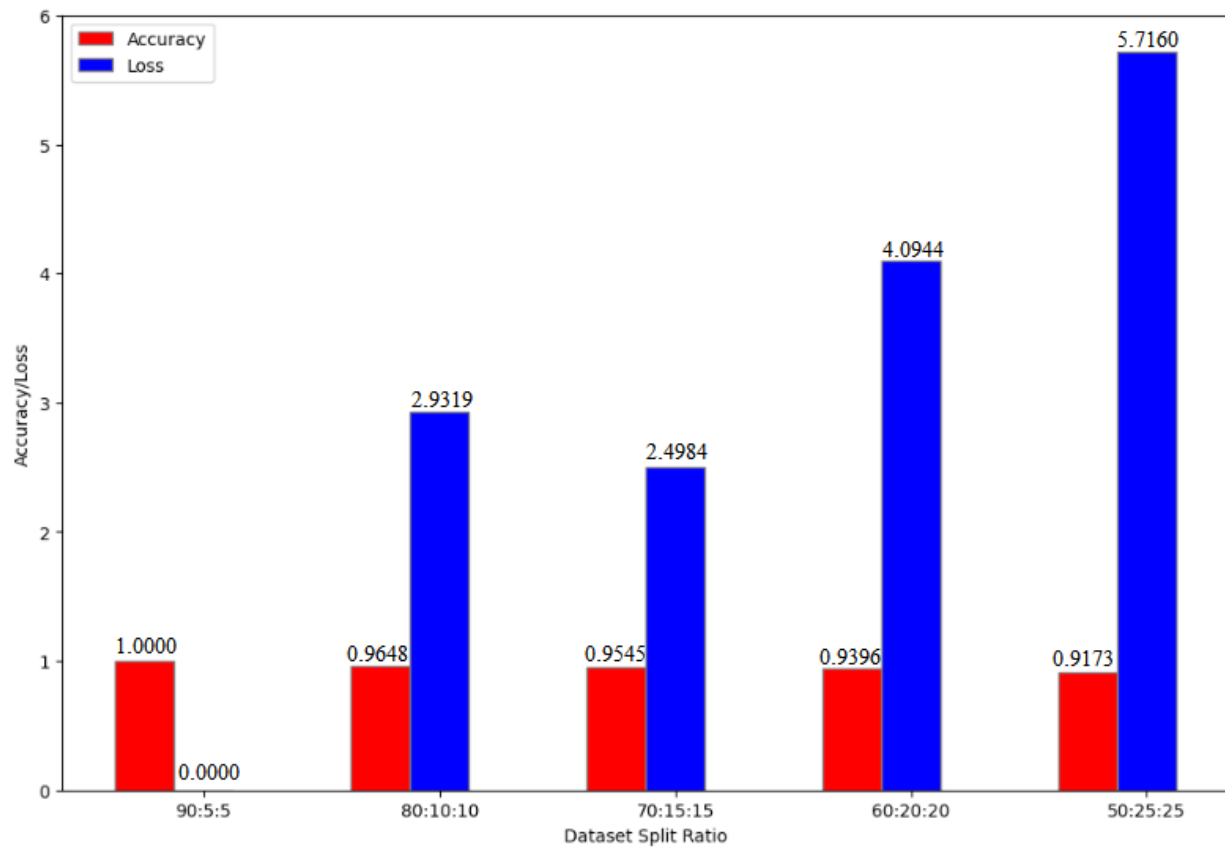


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80:10:10	0.98	0.94	1.00	0.97	0.97	0.99	0.82	0.96	0.98	0.96	0.90	0.96
70:15:15	0.94	0.99	0.88	0.96	0.99	0.92	0.93	0.95	0.96	0.95	0.90	0.95
60:20:20	0.96	0.92	0.93	0.94	0.95	0.95	0.76	0.94	0.95	0.94	0.84	0.94
50:25:25	0.96	0.88	0.85	0.92	0.93	0.95	0.64	0.92	0.94	0.91	0.73	0.92

### *Accuracy and Loss*

- 90-5-5: 1.0000, 0.0000
- 80-10-10: 0.9648, 2.9319
- 70-15-15: 0.9545, 2.4984
- 60-20-20: 0.9396, 4.0944
- 50-25-25: 0.9173, 5.7160



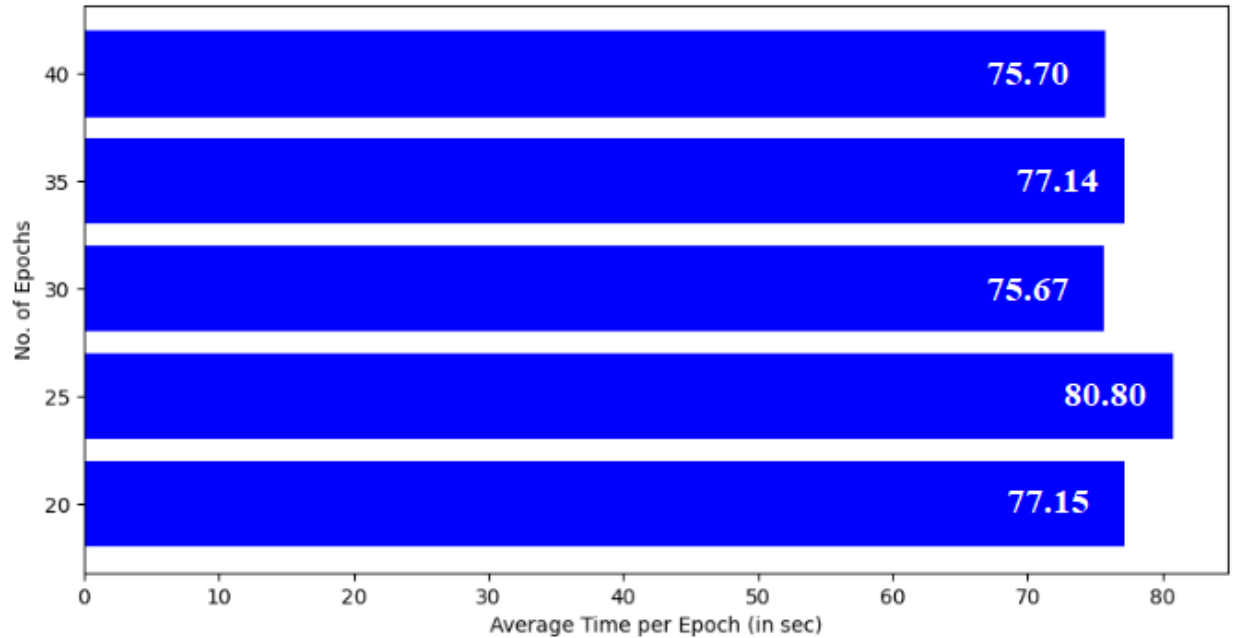


## MODEL 6: AlexNet

### No. of Epochs

#### *Average Time per Epoch*

- 20: 77.15 s
- 25: 80.80 s
- 30: 75.67 s
- 35: 77.14 s
- 40: 75.70 s

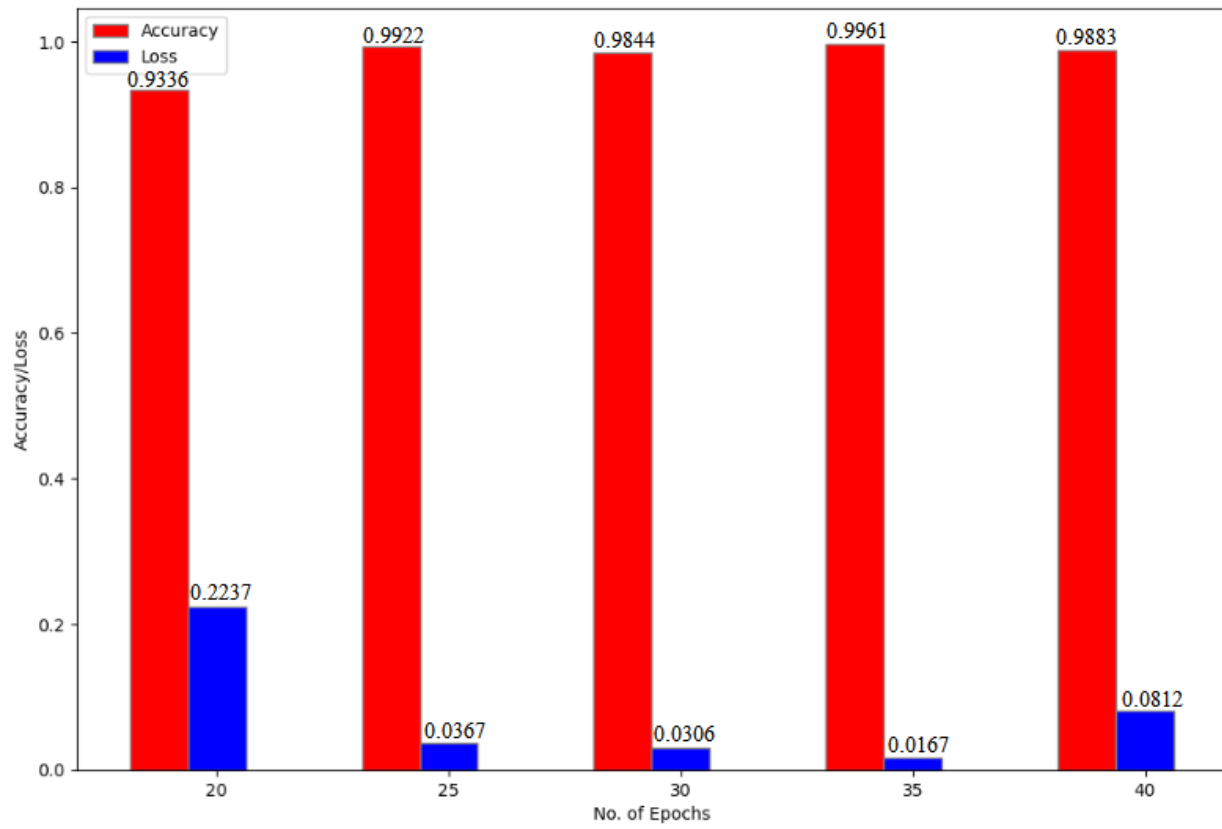


#### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
20	1.00	0.86	1.00	0.94	0.90	1.00	0.78	0.93	0.95	0.93	0.88	0.93
25	1.00	0.98	1.00	0.99	0.98	1.00	1.00	0.99	0.99	0.99	1.00	0.99
30	1.00	0.97	1.00	0.98	1.00	1.00	0.82	0.98	1.00	0.98	0.90	0.98
35	1.00	1.00	0.94	1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.97	1.00
40	0.99	0.98	1.00	0.99	1.00	0.99	0.88	0.99	1.00	0.99	0.93	0.99

### *Accuracy and Loss*

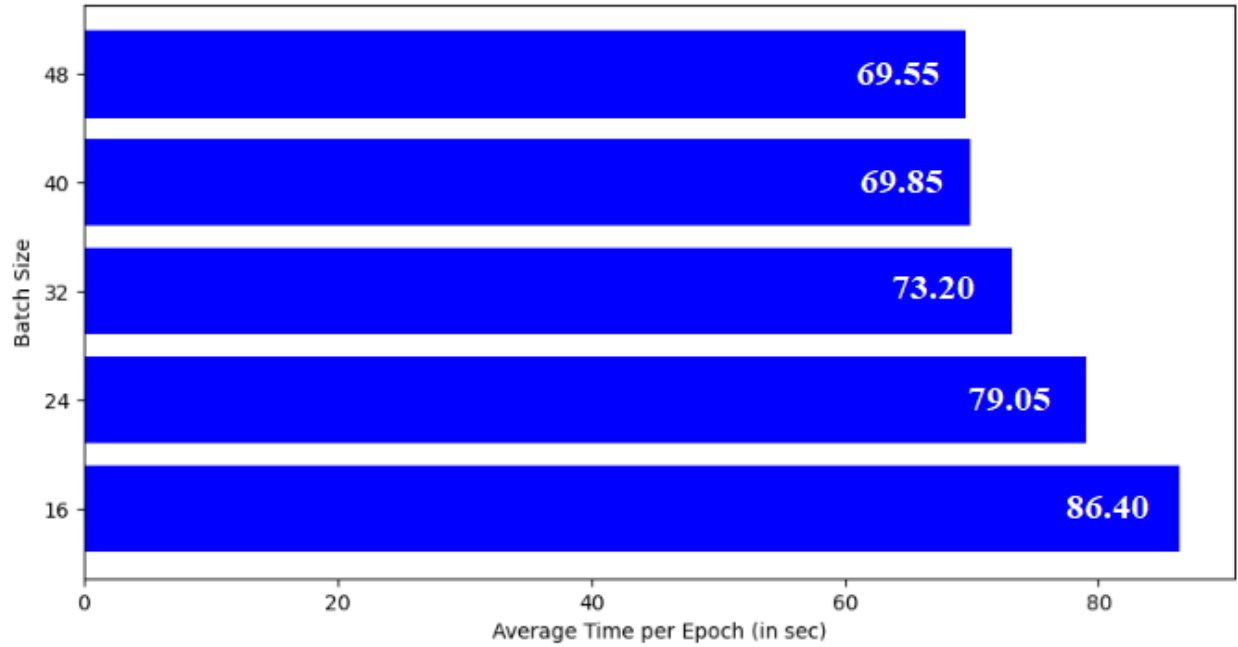
- 20: 0.9336, 0.2237
- 25: 0.9922, 0.0367
- 30: 0.9844, 0.0306
- 35: 0.9961, 0.0167
- 40: 0.9883, 0.0812



## Batch Size

### *Average Time per Epoch*

- 16: 86.40 s
- 24: 79.05 s
- 32: 73.20 s
- 40: 69.85 s
- 48: 69.55 s

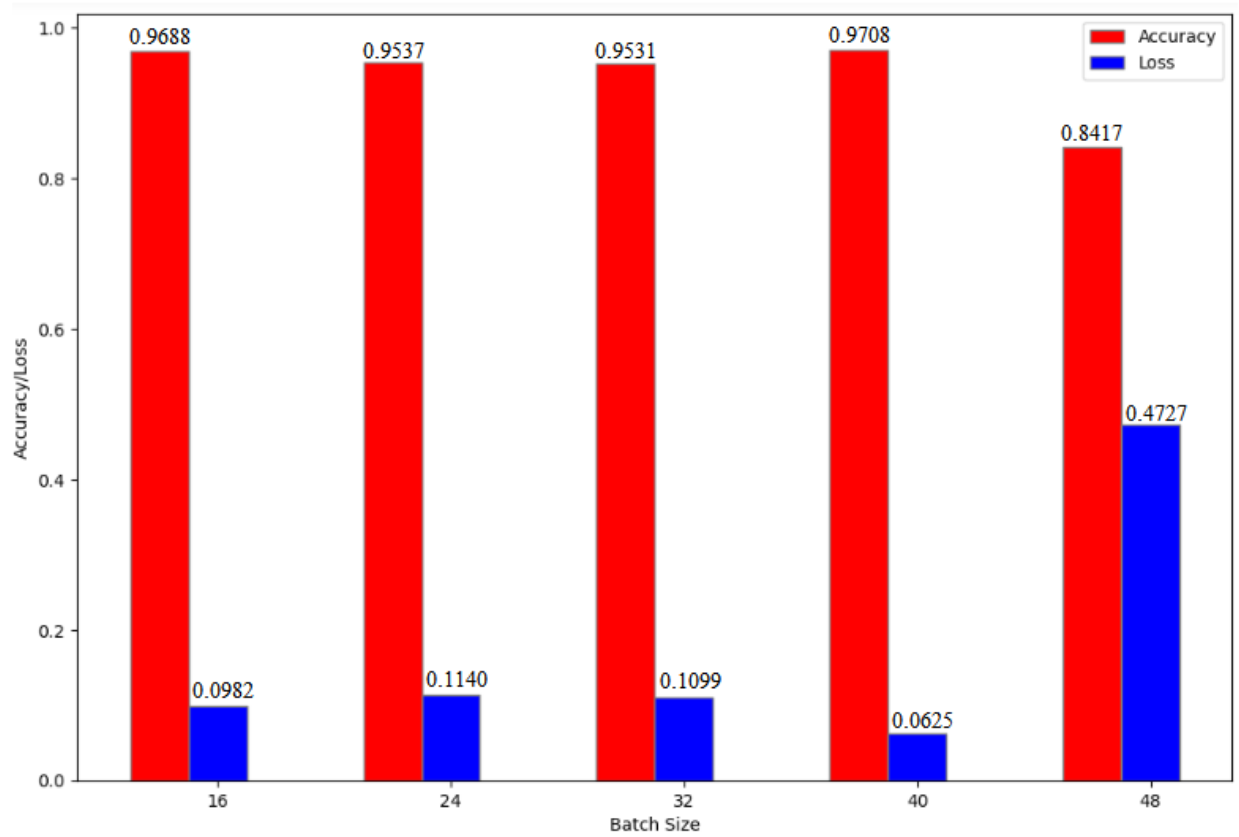


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Batch Size	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
16	0.99	0.97	0.82	0.97	0.98	0.97	0.93	0.97	0.98	0.97	0.87	0.97
24	0.99	0.91	1.00	0.96	0.95	0.99	0.78	0.95	0.97	0.95	0.88	0.95
32	0.99	0.91	1.00	0.96	0.96	1.00	0.73	0.95	0.97	0.95	0.84	0.95
40	0.97	1.00	0.85	0.97	1.00	0.93	1.00	0.97	0.99	0.96	0.92	0.97
48	1.00	0.72	1.00	0.89	0.84	1.00	0.14	0.84	0.91	0.84	0.24	0.82

### *Accuracy and Loss*

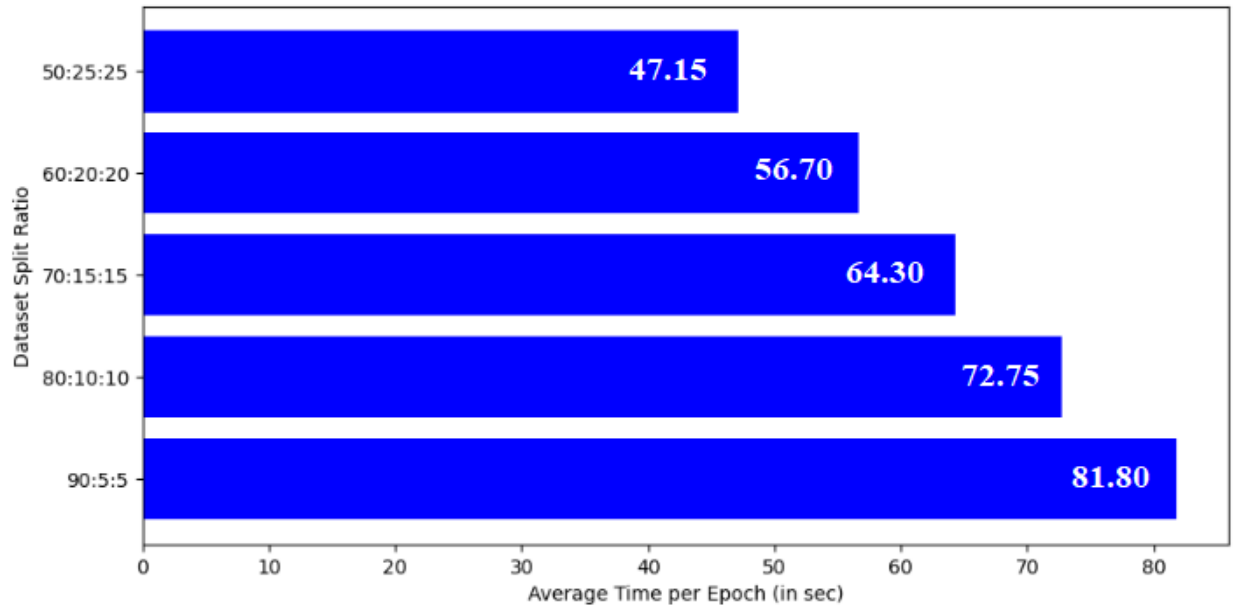
- 16: 0.9688, 0.0982
- 24: 0.9537, 0.1140
- 32: 0.9531, 0.1099
- 40: 0.9708, 0.0625
- 48: 0.8417, 0.4727



## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 81.80 s
- 80-10-10: 72.75 s
- 70-15-15: 64.30 s
- 60-20-20: 56.70 s
- 50-25-25: 47.15 s

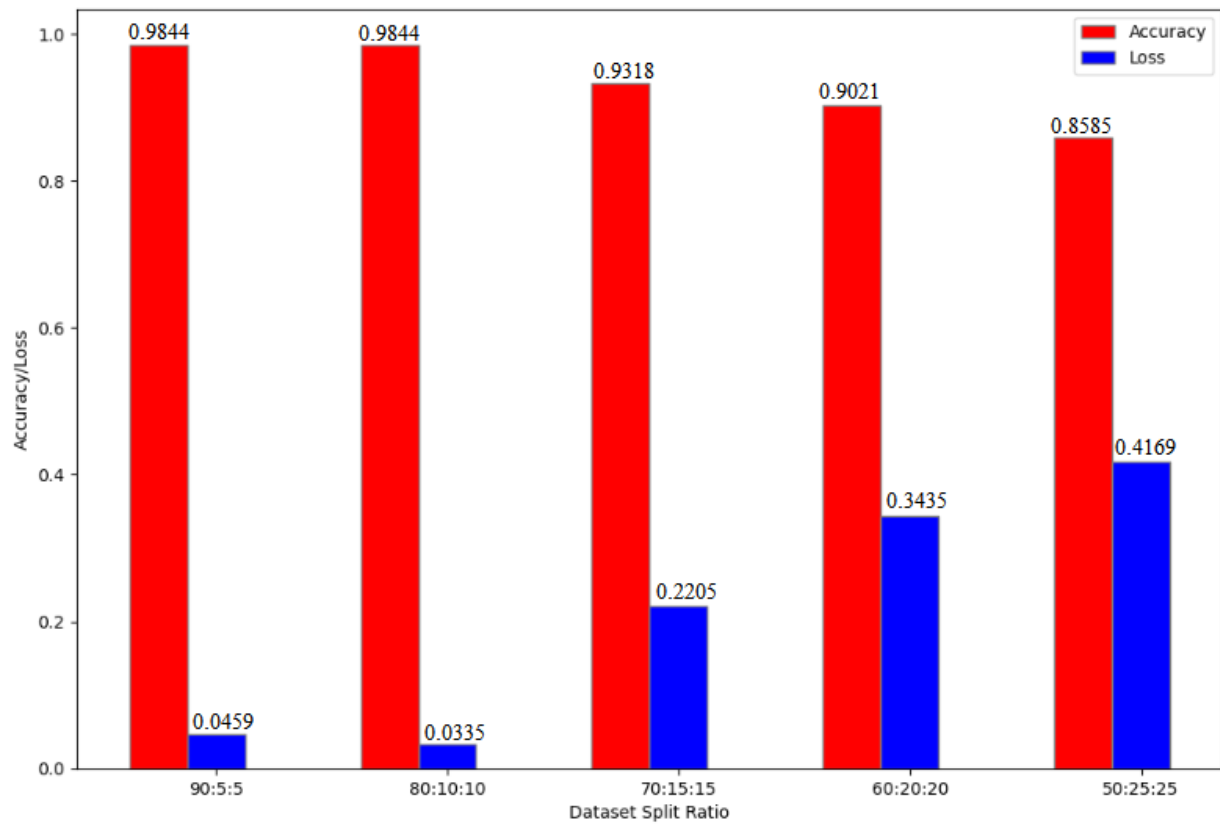


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	0.98	0.98	1.00	0.98	0.98	0.98	1.00	0.98	0.98	0.98	1.00	0.98
80:10:10	1.00	0.97	1.00	0.98	0.99	1.00	0.82	0.98	1.00	0.98	0.90	0.98
70:15:15	0.98	0.88	1.00	0.94	0.95	0.99	0.41	0.93	0.97	0.93	0.58	0.93
60:20:20	0.98	0.84	1.00	0.92	0.88	1.00	0.23	0.90	0.93	0.91	0.38	0.89
50:25:25	0.99	0.77	1.00	0.89	0.74	1.00	0.75	0.86	0.85	0.87	0.86	0.86

### *Accuracy and Loss*

- 90-5-5: 0.9844, 0.0459
- 80-10-10: 0.9844, 0.0335
- 70-15-15: 0.9318, 0.2205
- 60-20-20: 0.9021, 0.3435
- 50-25-25: 0.8585, 0.4169



## Dataset 2: Potato

### BASE MODELS

#### MODEL 1 – CNN

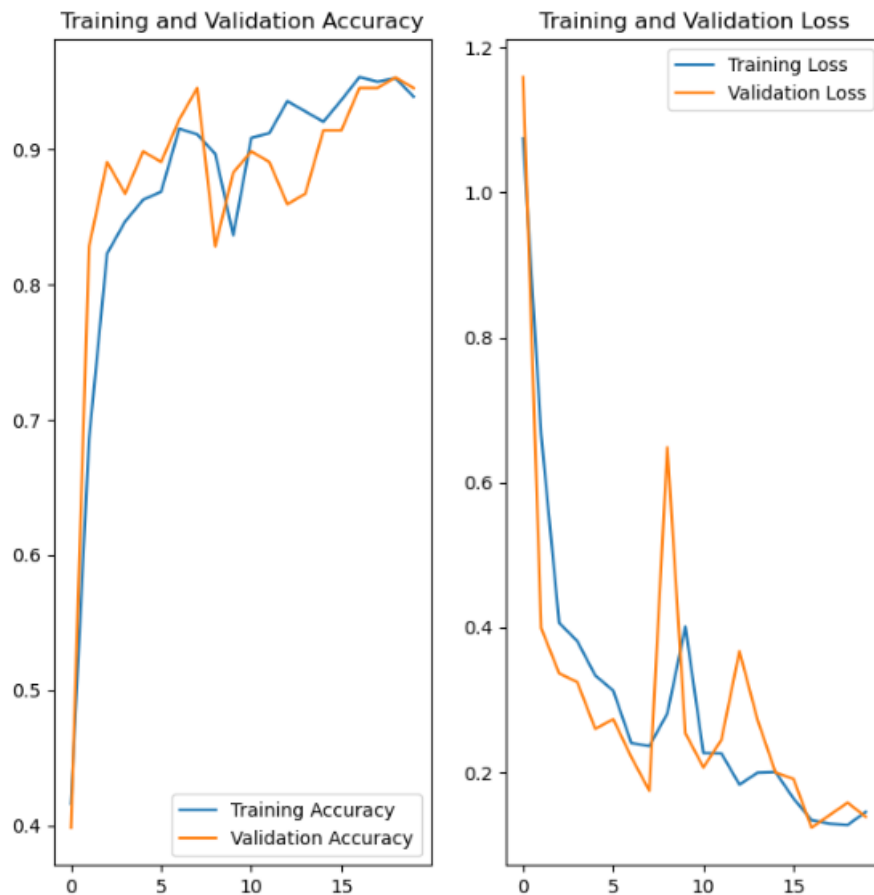
##### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 1500 (Early Blight: 500, Late Blight: 500, Healthy: 500) – 80:10:10 Split	
Train	1184
Validation	128
Test	188

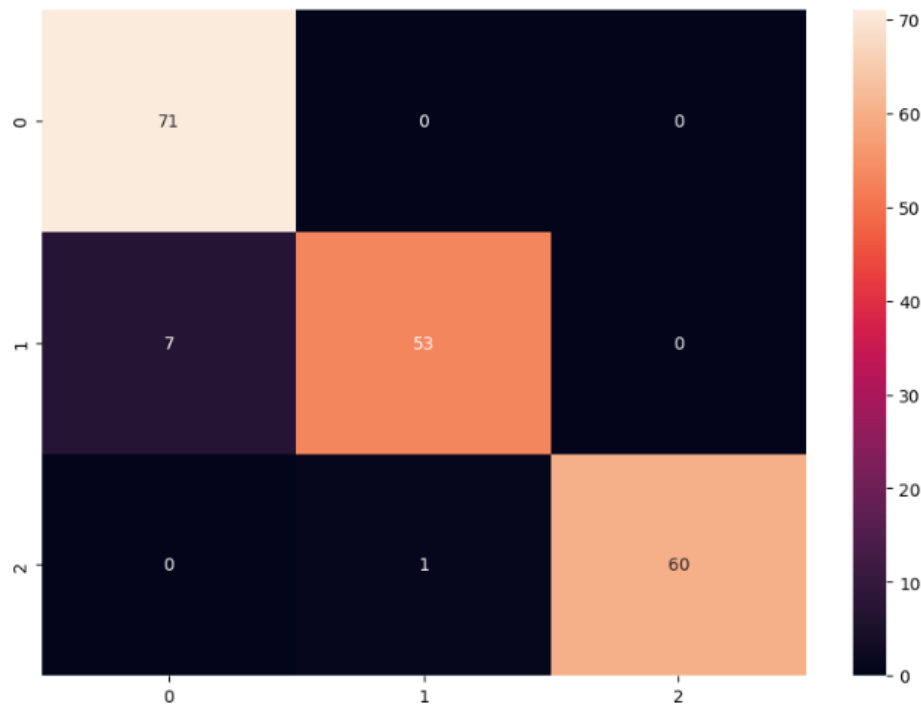
##### *Model Summary*

- Image Size: 256 x 256
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 20

##### *Graph*

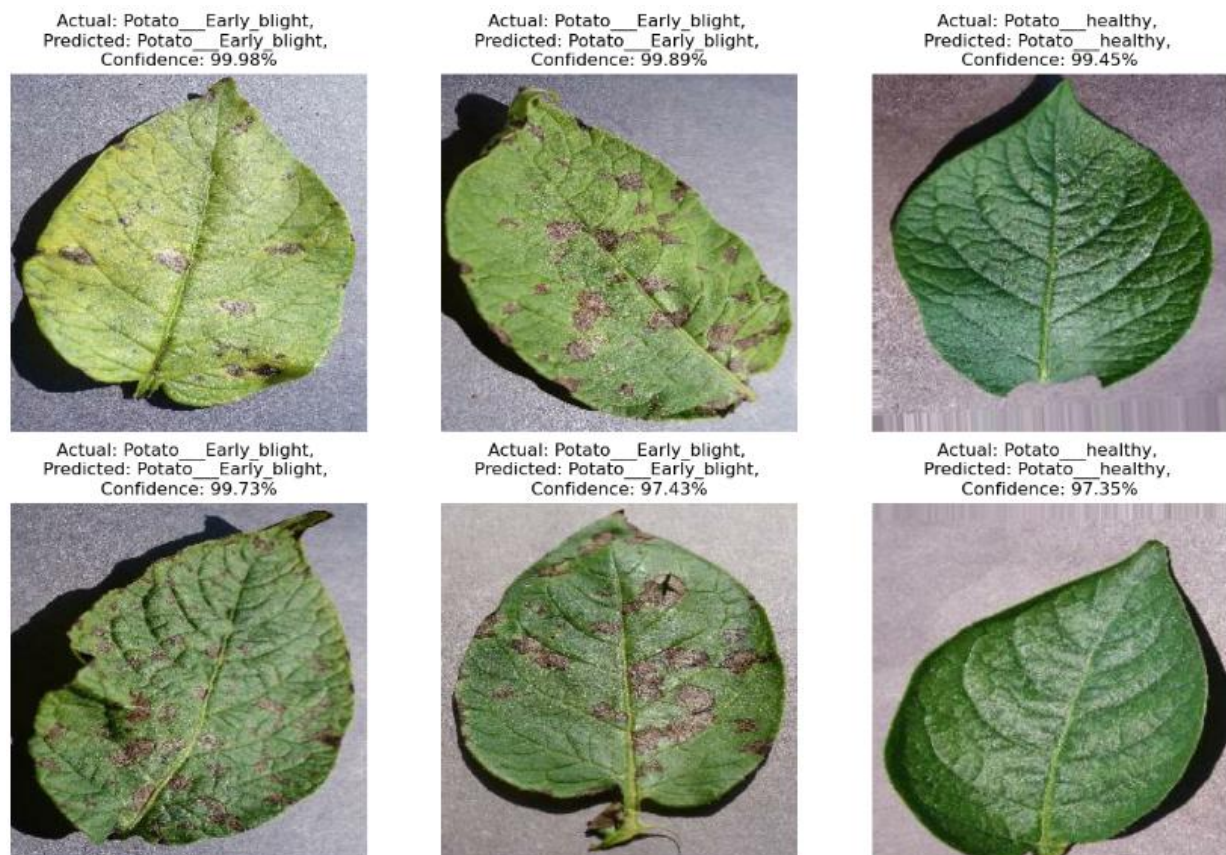


## Confusion Matrix



Misclassification Rate: 4.44% (0.00%, 11.67%, 1.64%)

## Predictions





## MODEL 2 – ResNet50

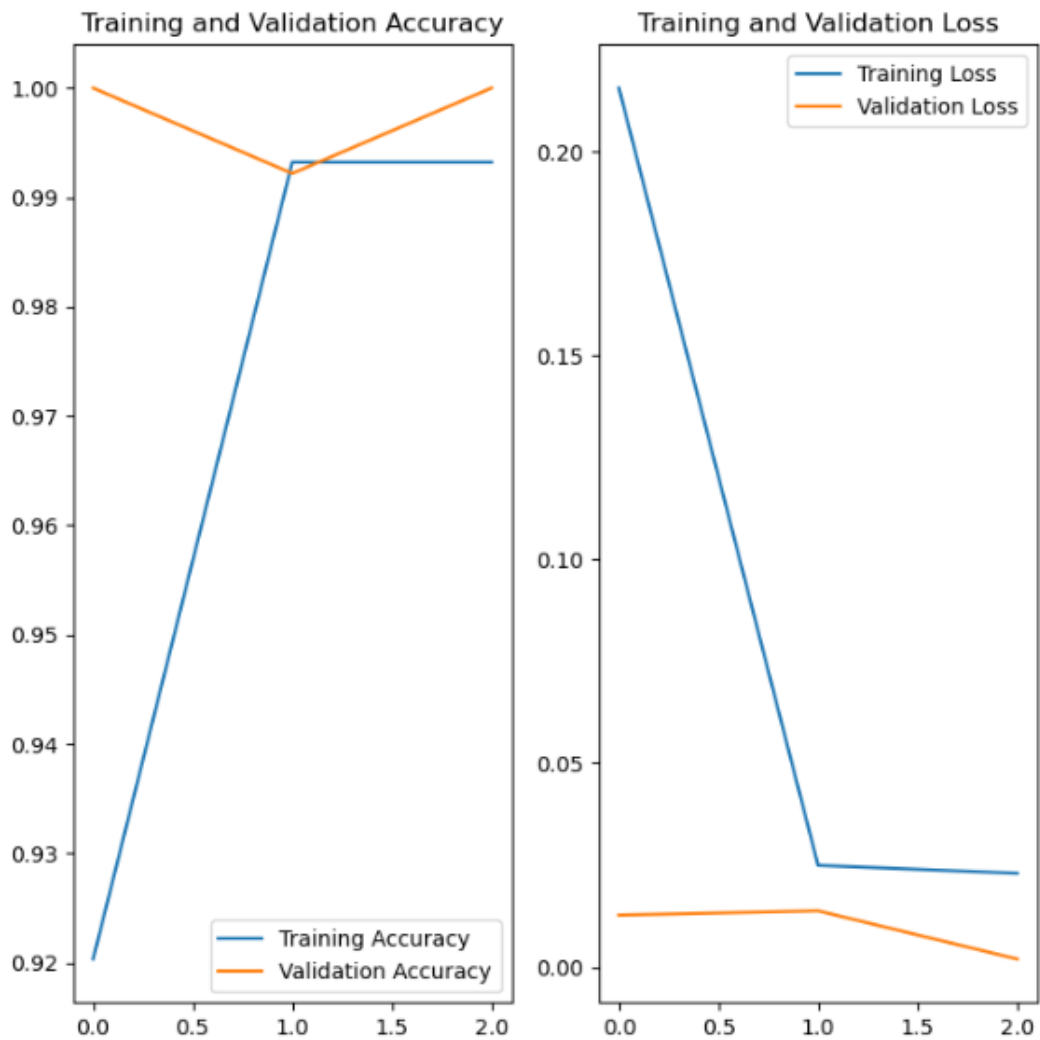
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 1500 (Early Blight: 500, Late Blight: 500, Healthy: 500) – 80:10:10 Split	
Train	1184
Validation	128
Test	188

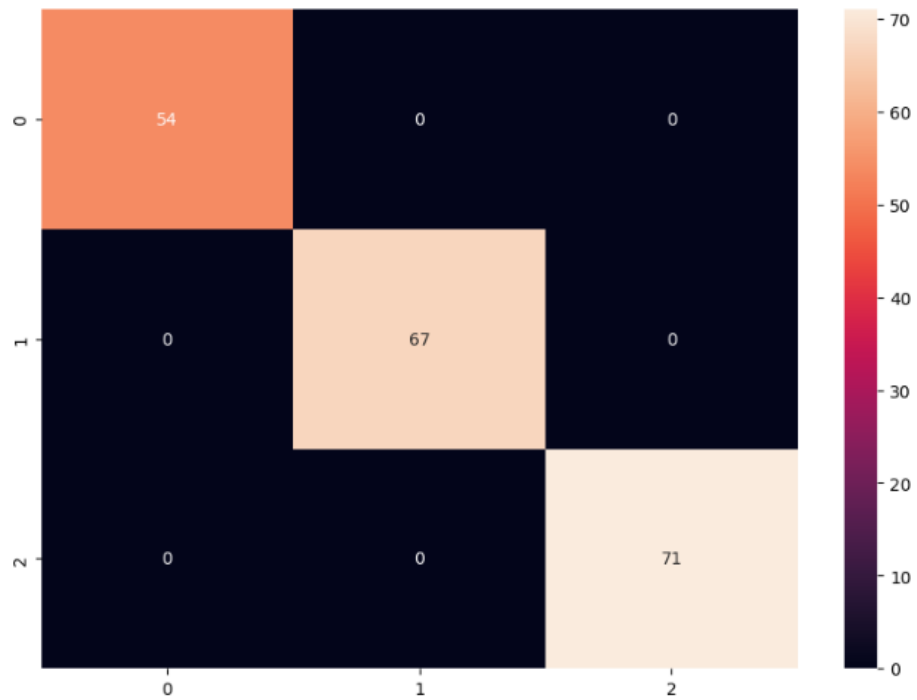
### *Model Summary*

- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 5

### *Graph*



## Confusion Matrix



Misclassification Rate: 0.00% (0.00%, 0.00%, 0.00%)

## Predictions

Actual: Potato\_\_Early\_blight,  
Predicted: Potato\_\_Early\_blight,  
Confidence: 99.78%



Actual: Potato\_\_Early\_blight,  
Predicted: Potato\_\_Early\_blight,  
Confidence: 93.05%



Actual: Potato\_\_healthy,  
Predicted: Potato\_\_healthy,  
Confidence: 99.37%



Actual: Potato\_\_Late\_blight,  
Predicted: Potato\_\_Late\_blight,  
Confidence: 99.99%



Actual: Potato\_\_healthy,  
Predicted: Potato\_\_healthy,  
Confidence: 100.0%



Actual: Potato\_\_Late\_blight,  
Predicted: Potato\_\_Late\_blight,  
Confidence: 100.0%



## MODEL 3 – VGG16

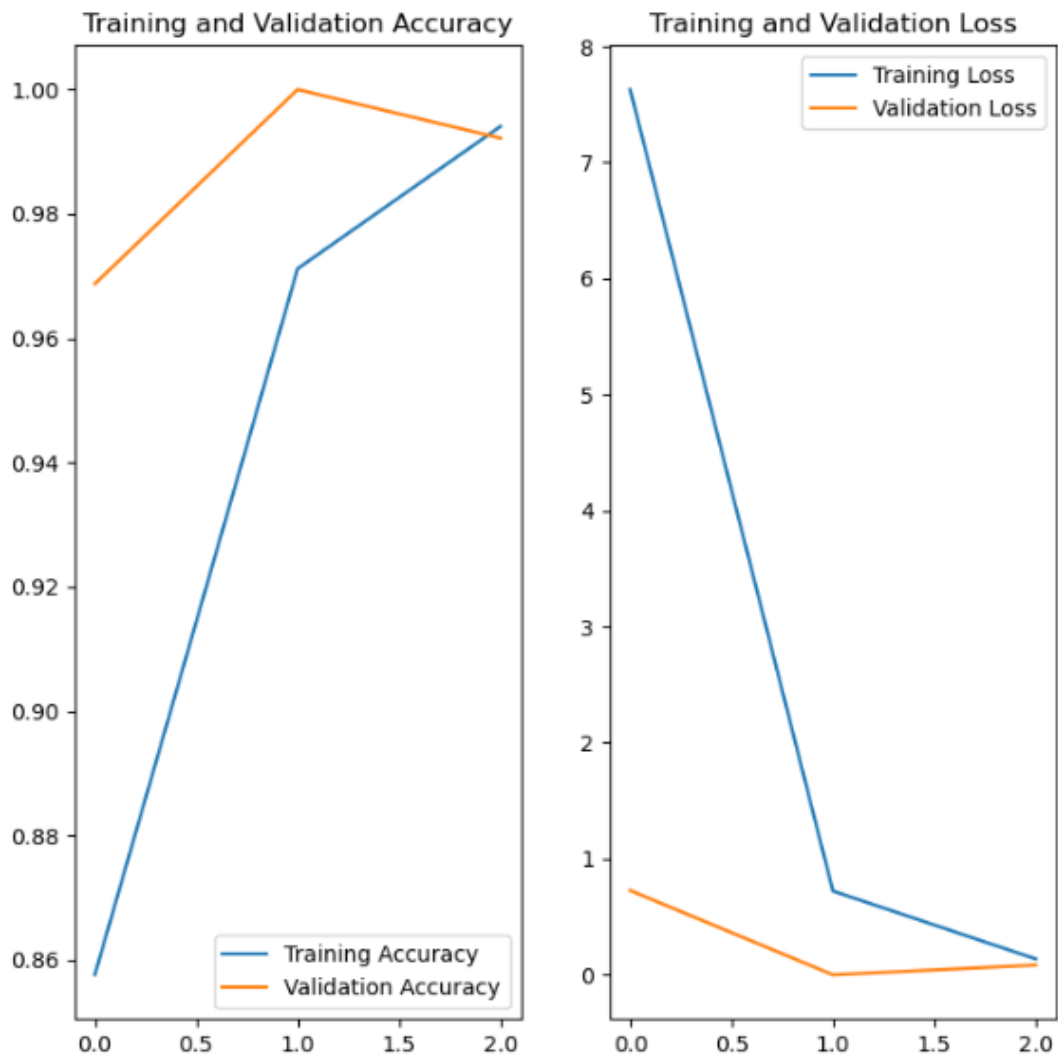
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 1500 (Early Blight: 500, Late Blight: 500, Healthy: 500) – 80:10:10 Split	
Train	1184
Validation	128
Test	188

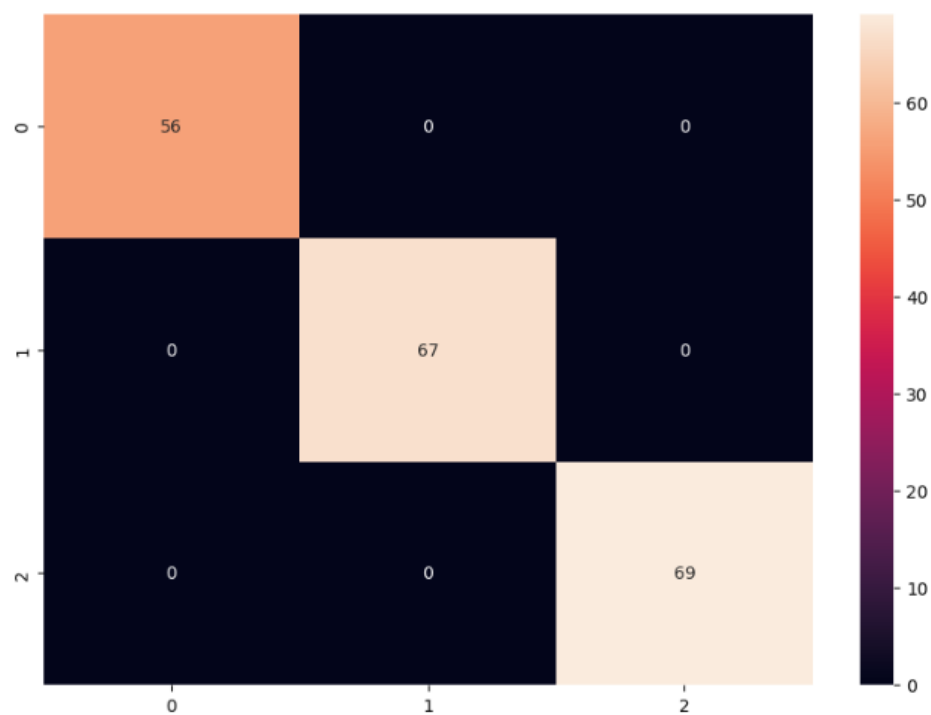
### *Model Summary*

- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 3

### *Graph*

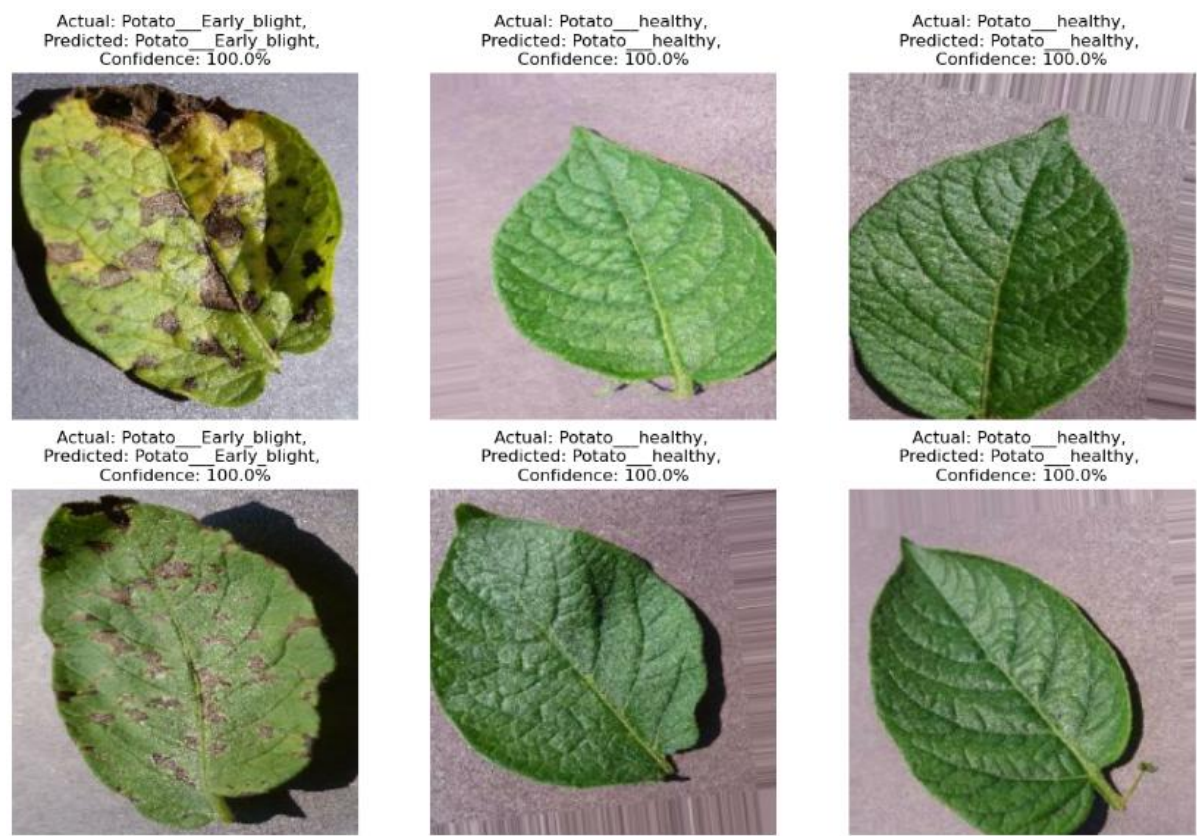


Confusion Matrix



Misclassification Rate: 0.00% (0.00%, 0.00%, 0.00%)

Predictions



## MODEL 4 – VGG19

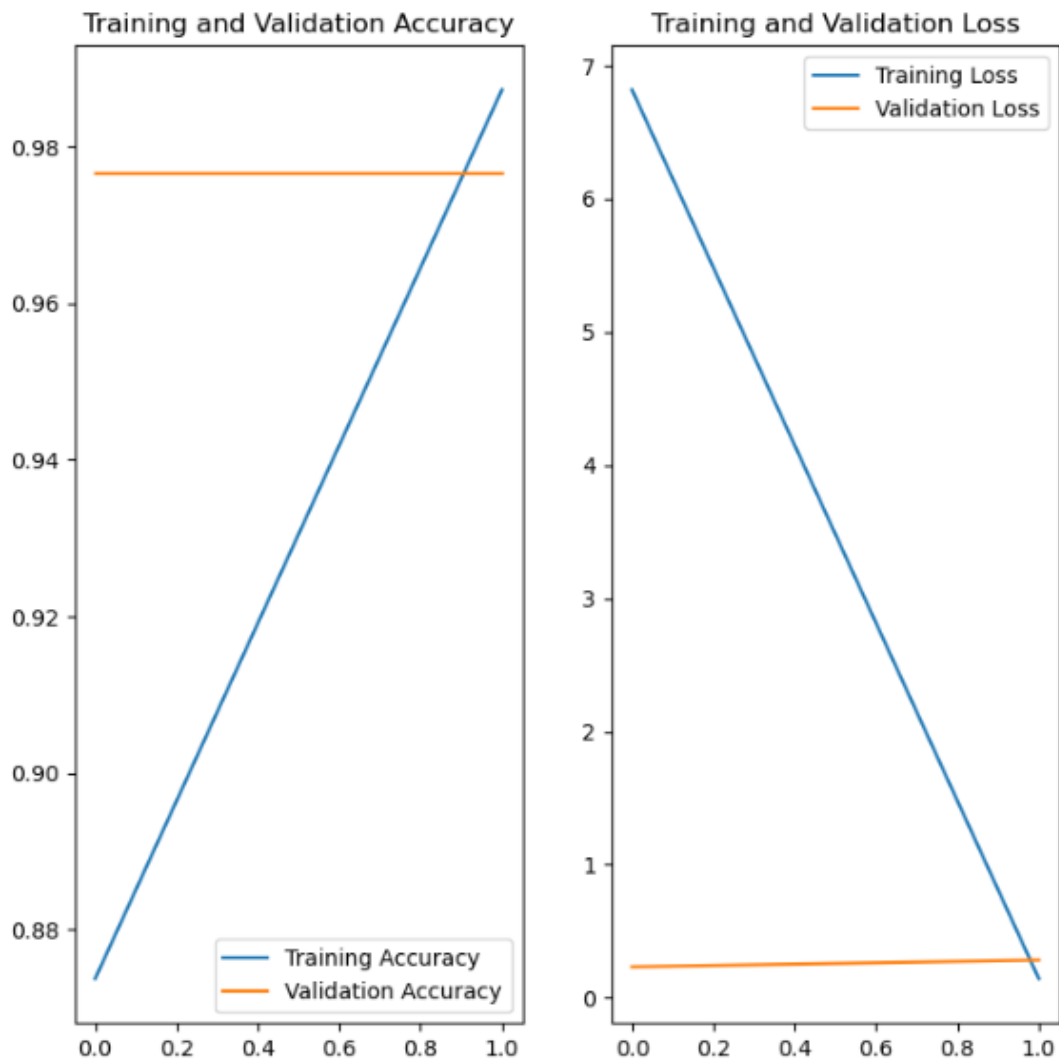
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 1500 (Early Blight: 500, Late Blight: 500, Healthy: 500) – 80:10:10 Split	
<b>Train</b>	1184
<b>Validation</b>	128
<b>Test</b>	188

### *Model Summary*

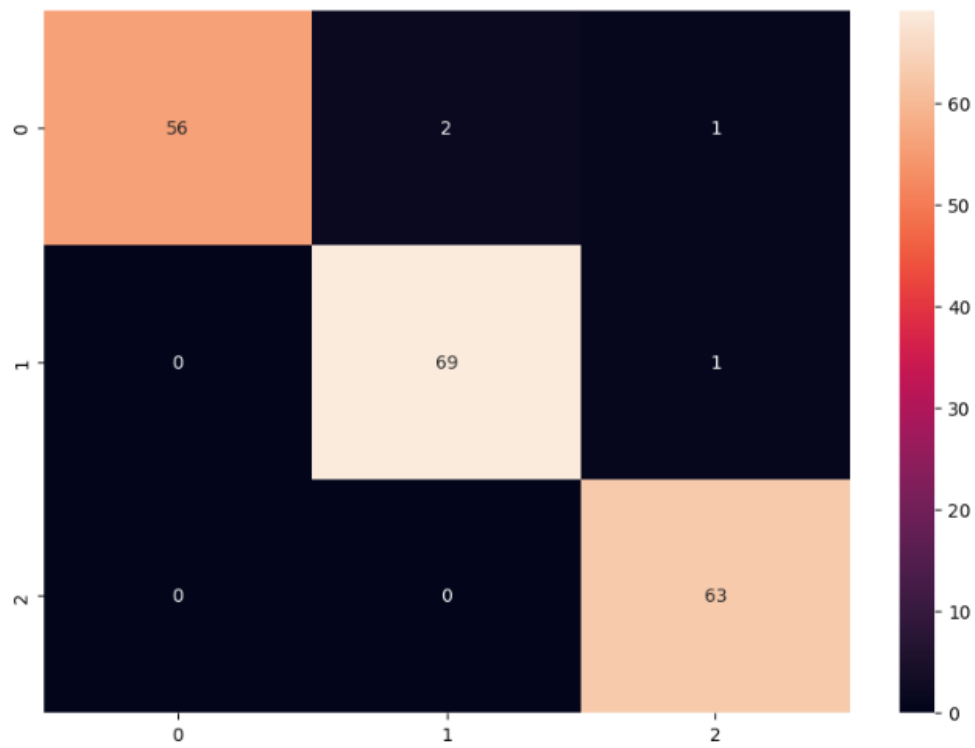
- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 2

### *Graph*



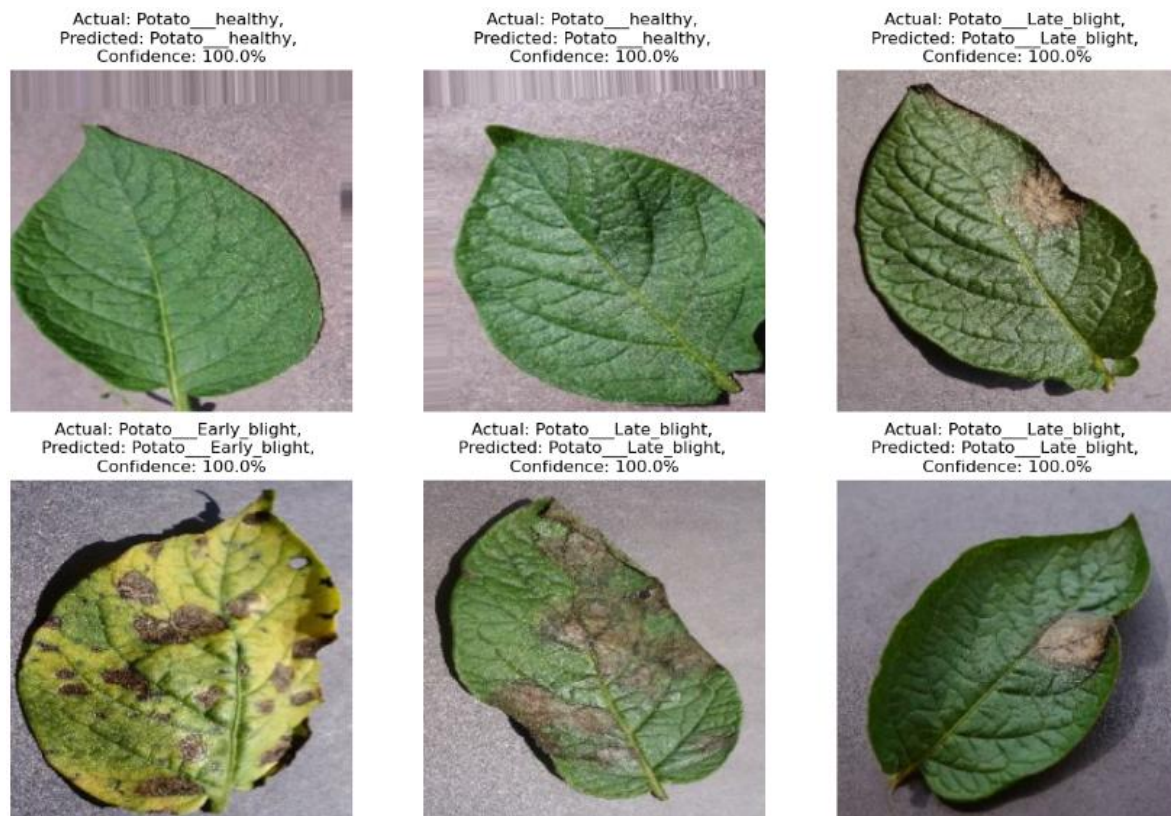


## Confusion Matrix



Misclassification Rate: 2.17% (5.08%, 1.43%, 0.00%)

## Predictions



## MODEL 5 – InceptionV3

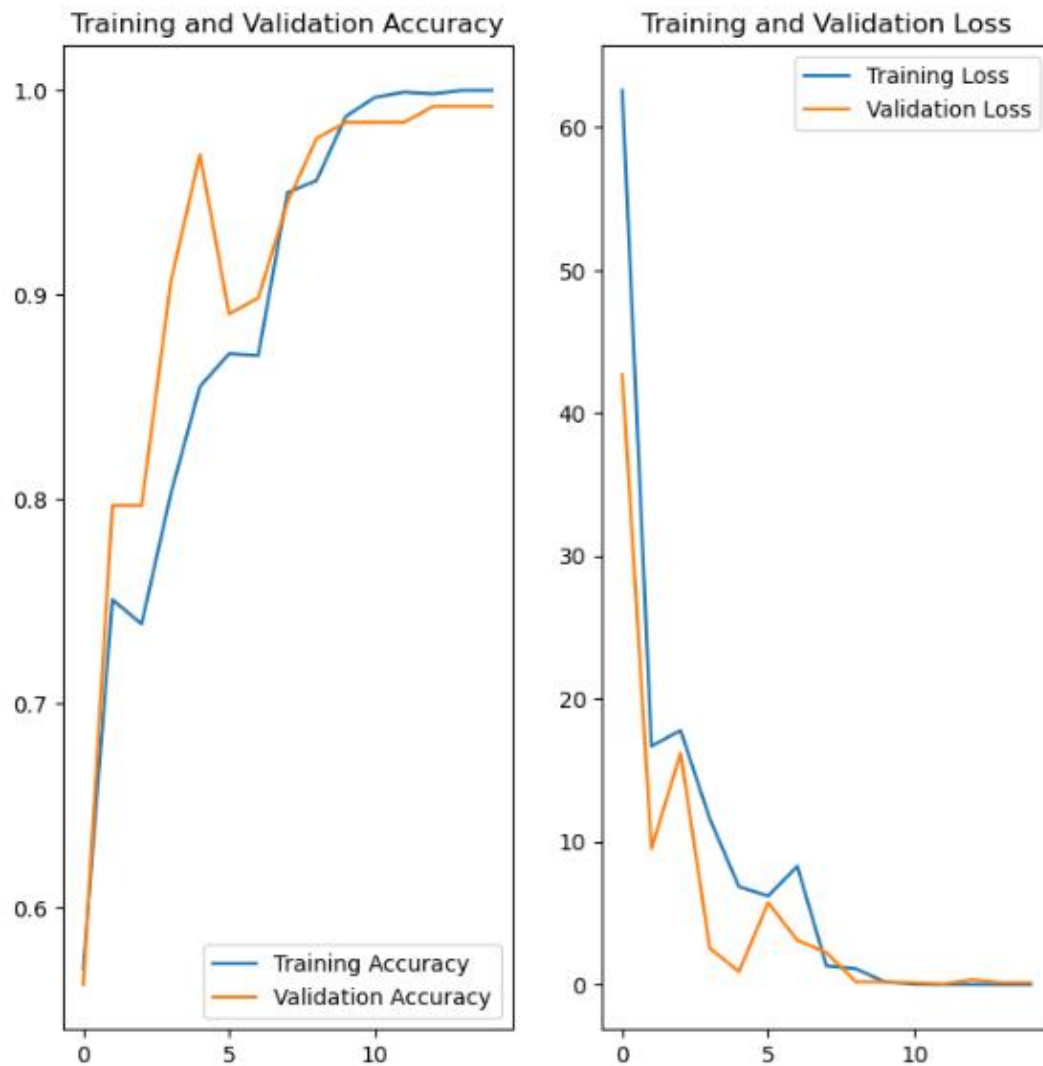
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 1500 (Early Blight: 500, Late Blight: 500, Healthy: 500) – 80:10:10 Split	
<b>Train</b>	1184
<b>Validation</b>	128
<b>Test</b>	188

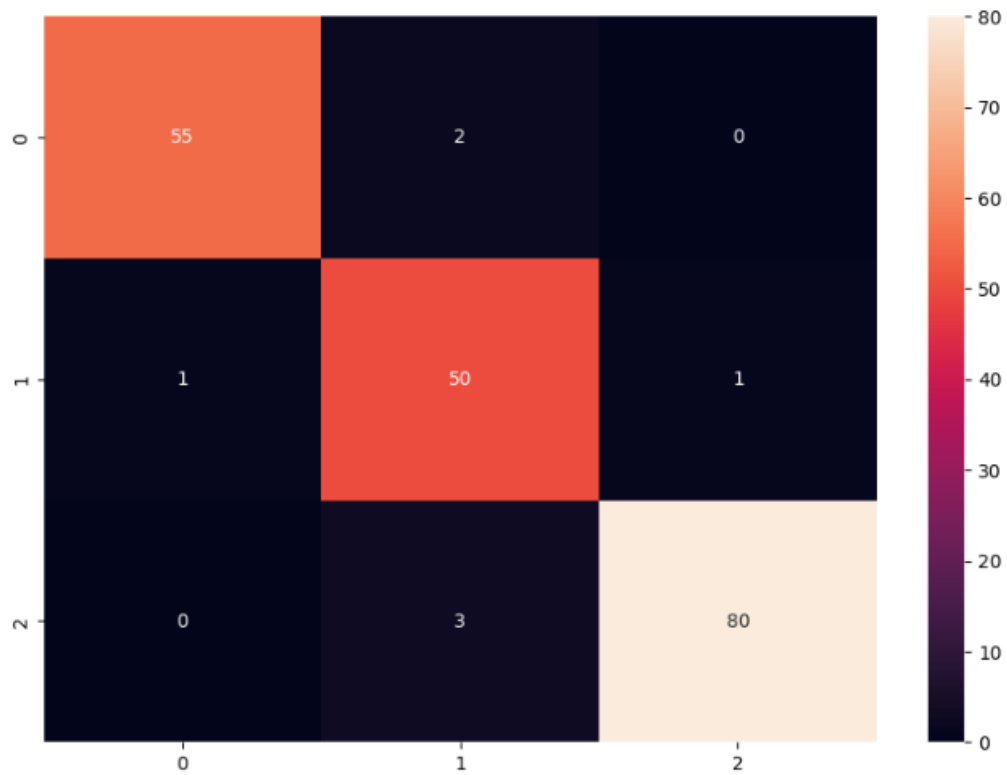
### *Model Summary*

- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 15

### *Graph*



## Confusion Matrix



Misclassification Rate: 3.66% (3.51%, 3.85%, 3.61%)

## Predictions





## MODEL 6 – AlexNet

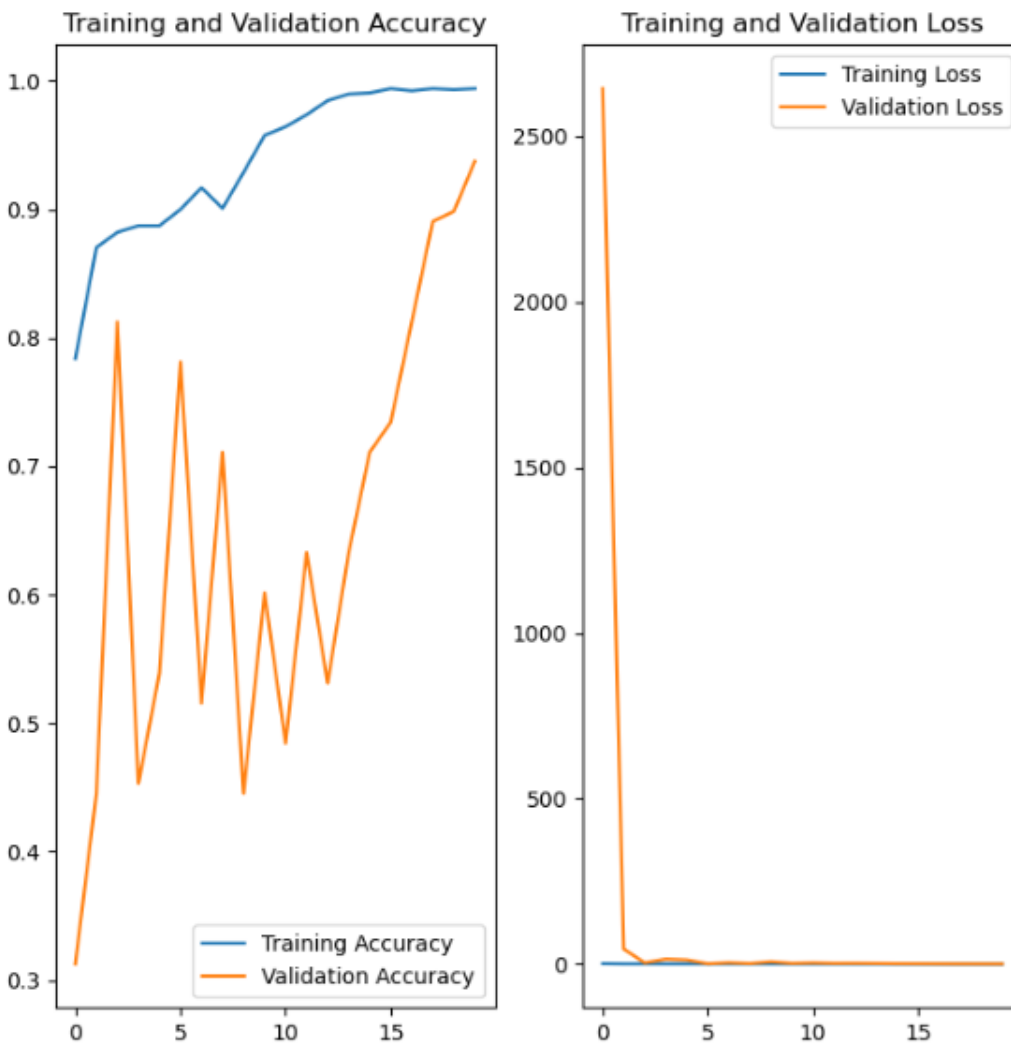
### *No. of Images in Train, Validation and Test Sets*

Total No. of Images: 1500 (Early Blight: 500, Late Blight: 500, Healthy: 500) – 80:10:10 Split	
Train	1184
Validation	128
Test	188

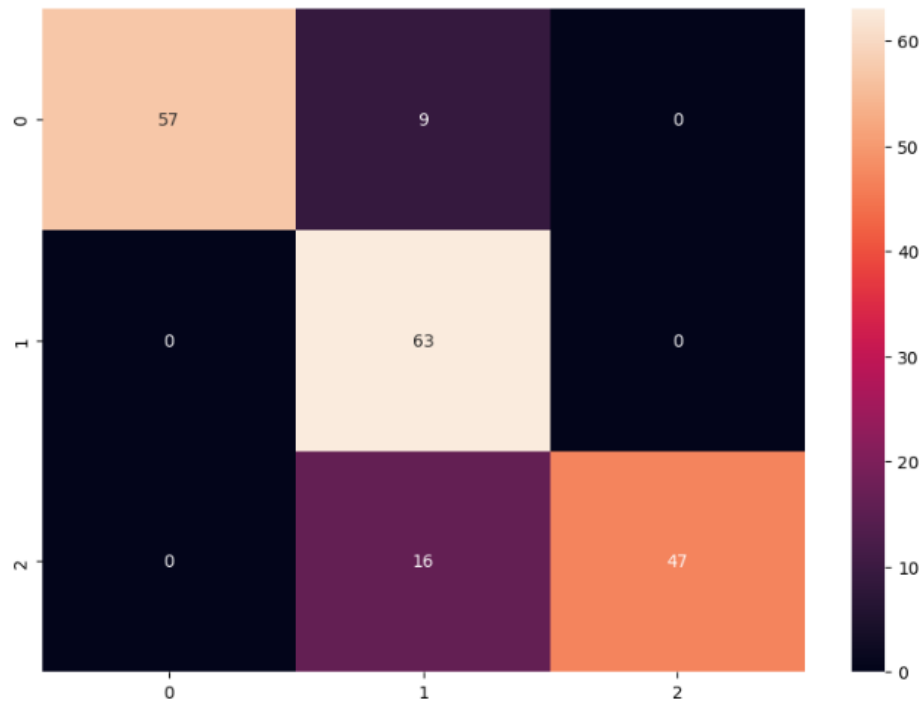
### *Model Summary*

- Image Size: 224 x 224
- Batch Size: 32
- No. of Channels: 3
- No. of Epochs: 20

### *Graph*

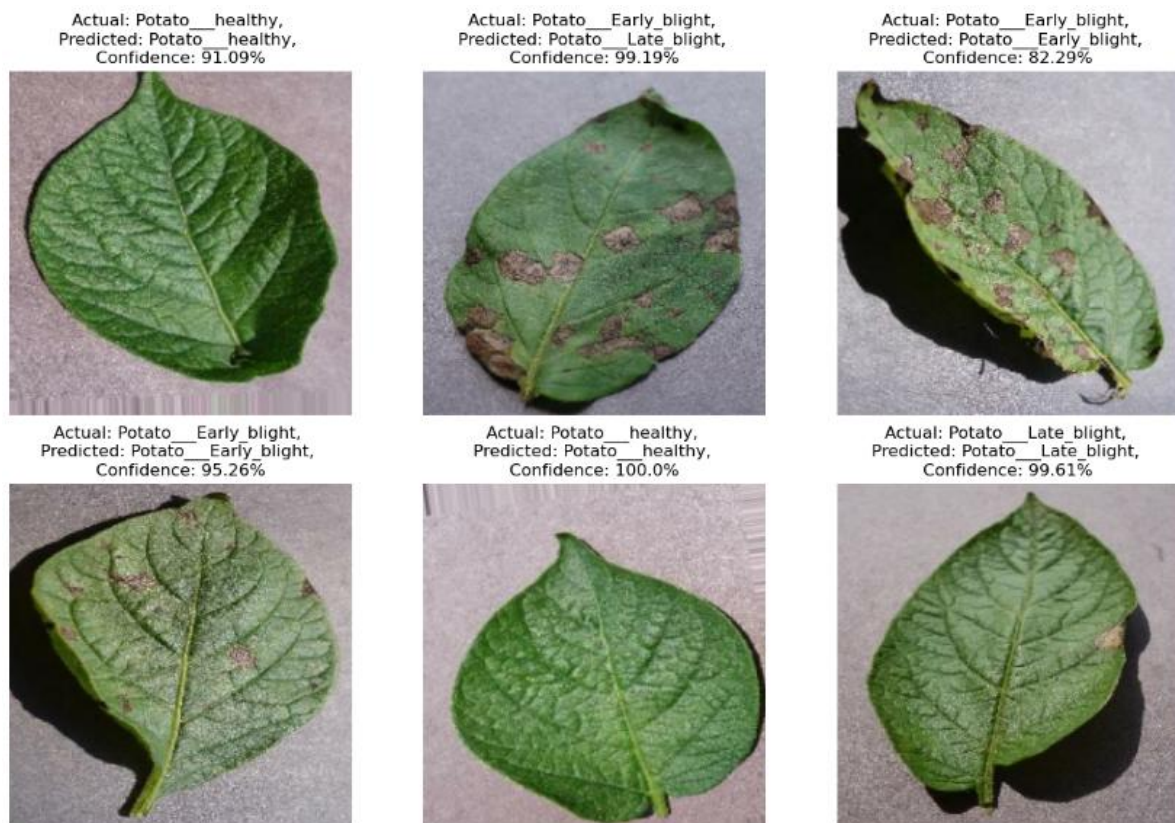


## Confusion Matrix



Misclassification Rate: 13.01% (13.64%, 0.00%, 25.40%)

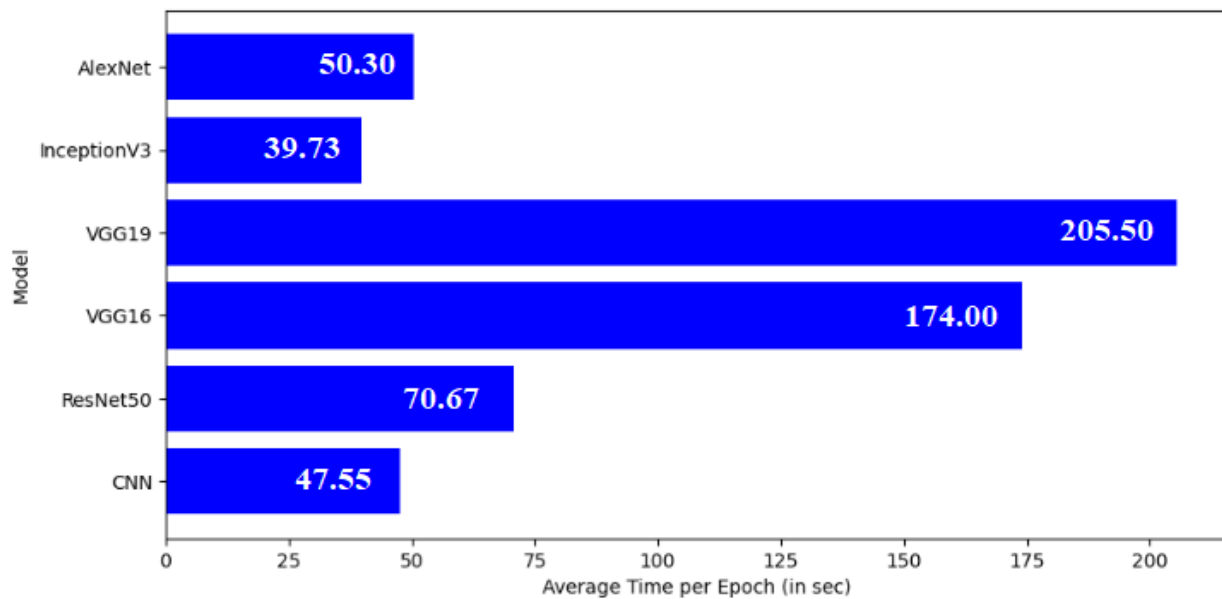
## Predictions



## COMPARISON OF BASE MODELS

### *Average Time per Epoch*

- Model 1 – CNN: 47.55 s
- Model 2 – ResNet50: 70.67 s
- Model 3 – VGG16: 174.00 s
- Model 4 – VGG19: 205.50 s
- Model 5 – InceptionV3: 39.73 s
- Model 6 – AlexNet: 50.30 s

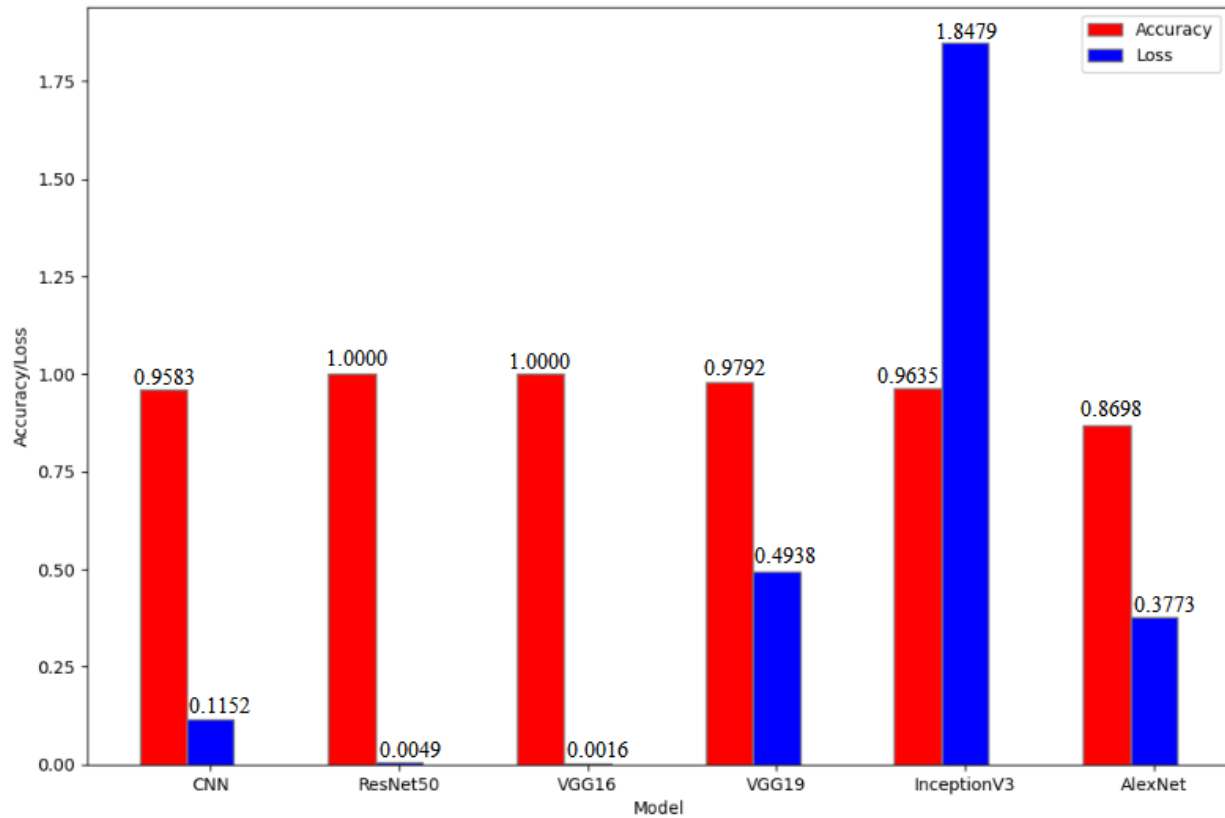


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Model	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
CNN	0.91	0.98	1.00	0.96	1.00	0.99	0.98	0.96	0.95	0.93	0.99	0.96
ResNet50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
VGG16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
VGG19	1.00	0.97	0.97	0.98	0.95	0.99	1.00	0.98	0.97	0.98	0.98	0.98
InceptionV3	0.98	0.91	0.99	0.96	0.96	0.96	0.96	0.96	0.97	0.93	0.98	0.96
AlexNet	1.00	0.72	1.00	0.91	0.86	1.00	0.75	0.87	0.93	0.83	0.85	0.87

## *Accuracy and Loss*

- Model 1 – CNN: 0.9583, 0.1152
- Model 2 – ResNet50: 1.0000, 0.0049
- Model 3 – VGG16: 1.0000, 0.0016
- Model 4 – VGG19: 0.9792, 0.4938
- Model 5 – InceptionV3: 0.9635, 1.8479
- Model 6 – AlexNet: 0.8698, 0.3773



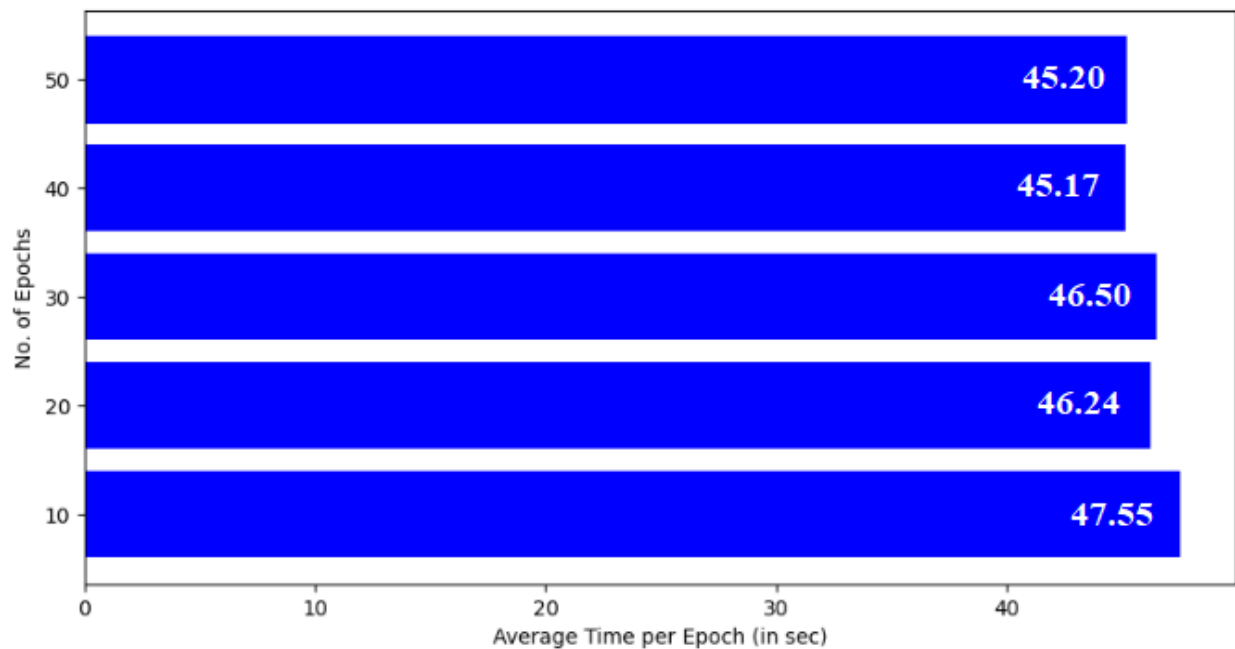
## MODEL COMPARISONS BASED ON NO. OF EPOCHS, BATCH SIZE AND DATASET SPLIT RATION

### MODEL 1: CNN

#### No. of Epochs

#### *Average Time per Epoch*

- 10: 47.55 s
- 20: 46.24 s
- 30: 46.50 s
- 40: 45.17 s
- 50: 45.20 s

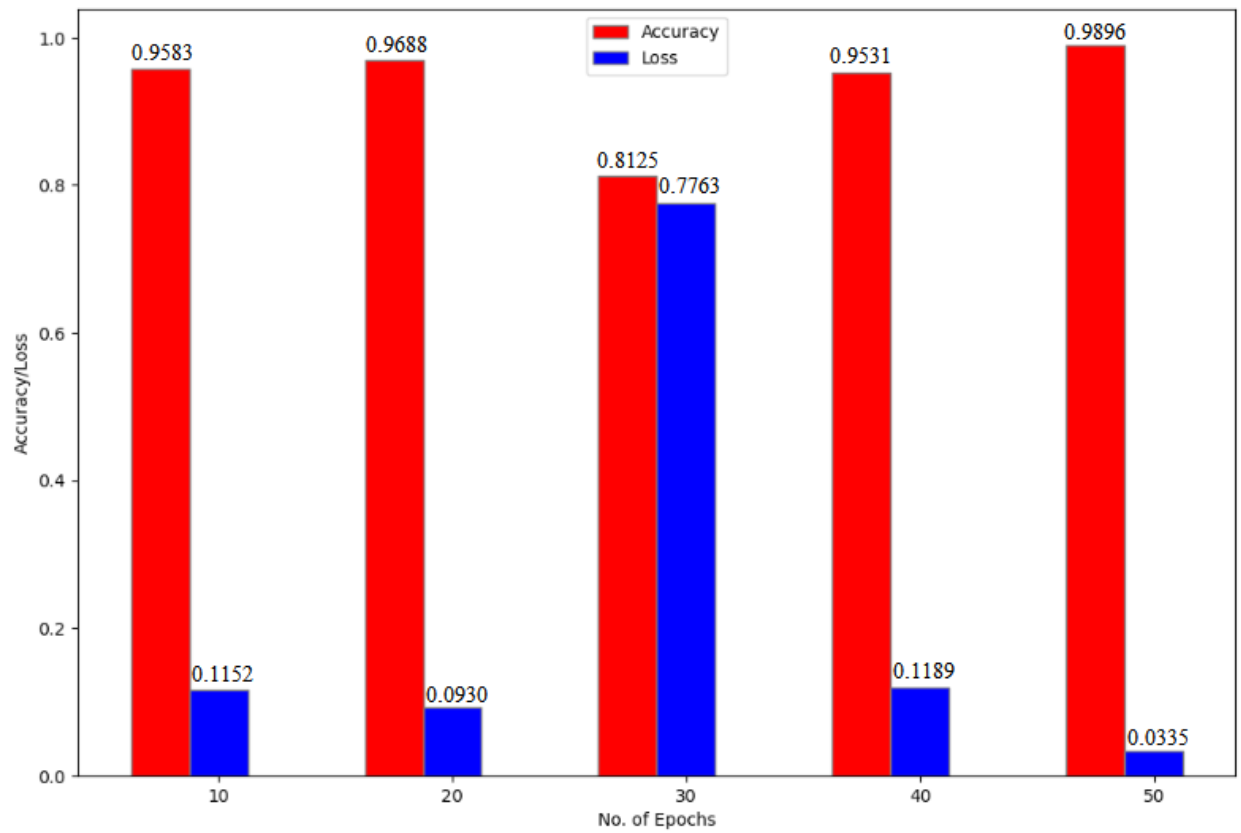


#### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
10	0.91	0.98	1.00	0.96	1.00	0.88	0.98	0.96	0.95	0.93	0.99	0.96
20	0.95	1.00	0.96	0.97	1.00	0.90	1.00	0.97	0.98	0.95	0.98	0.97
30	0.66	1.00	1.00	0.88	1.00	0.44	1.00	0.81	0.79	0.61	1.00	0.80
40	0.90	0.98	1.00	0.96	1.00	0.86	0.98	0.95	0.95	0.92	0.99	0.95
50	0.98	0.98	1.00	0.99	0.98	0.98	1.00	0.99	0.98	0.98	1.00	0.99

### *Accuracy and Loss*

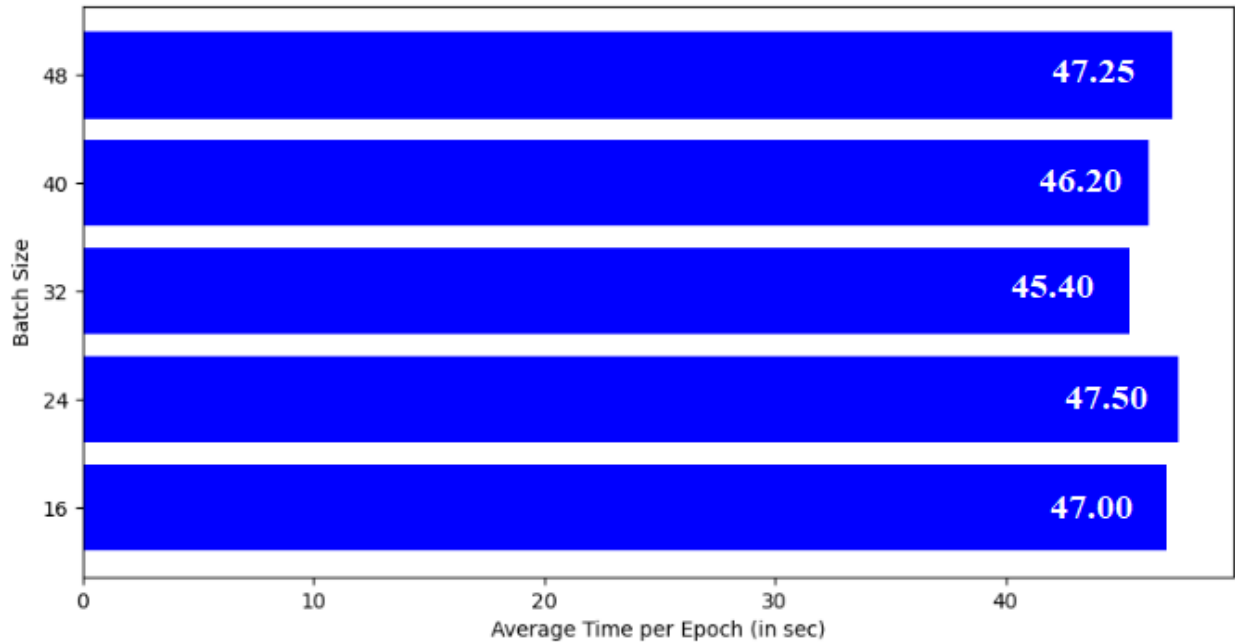
- 10: 0.9583, 0.1152
- 20: 0.9688, 0.0930
- 30: 0.8125, 0.7763
- 40: 0.9531, 0.1189
- 50: 0.9896, 0.0335



## Batch Size

### *Average Time per Epoch*

- 16: 47.00 s
- 24: 47.50 s
- 32: 45.40 s
- 40: 46.20 s
- 48: 47.25 s

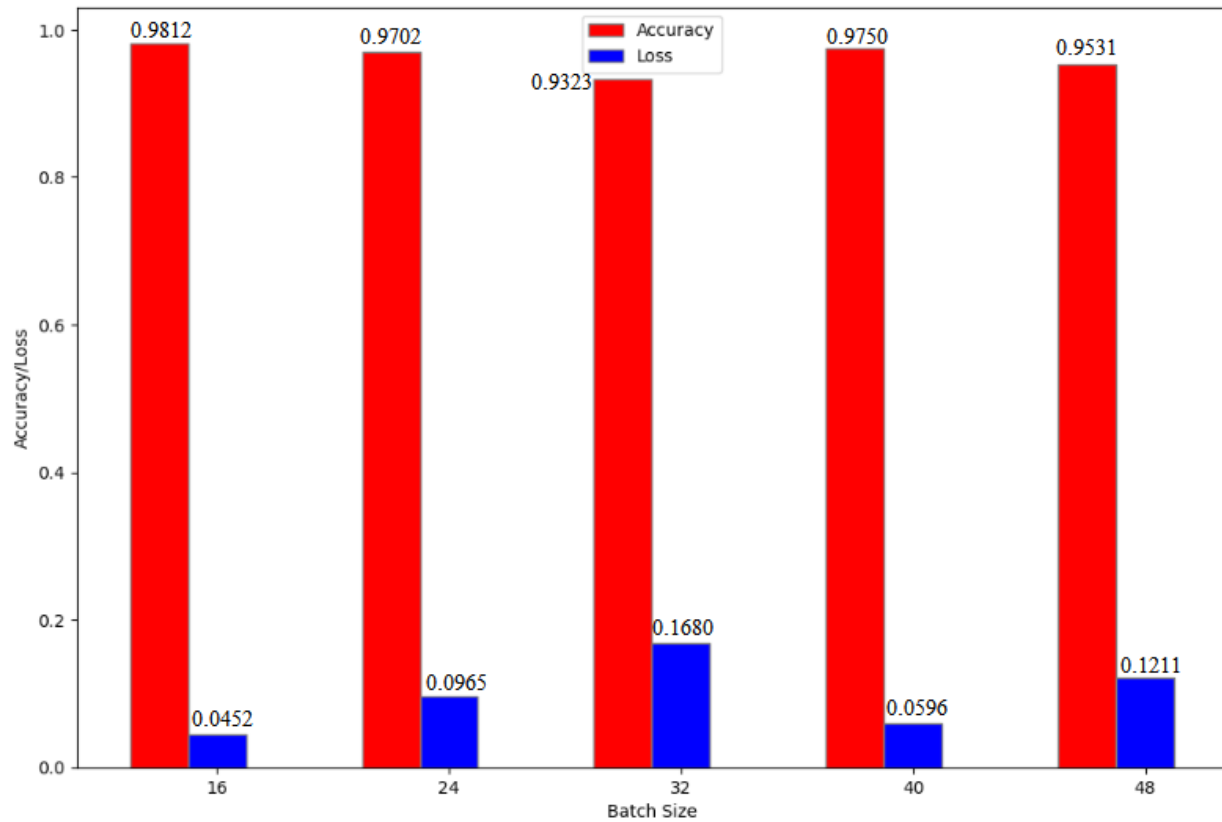


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Batch Size	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
16	0.94	1.00	1.00	0.98	1.00	0.95	1.00	0.98	0.97	0.97	1.00	0.98
24	0.98	0.93	1.00	0.97	1.00	0.98	0.93	0.97	0.99	0.96	0.96	0.97
32	0.88	0.93	0.98	0.94	1.00	0.86	0.94	0.93	0.94	0.90	0.96	0.93
40	0.94	1.00	0.99	0.98	1.00	0.92	1.00	0.97	0.97	0.96	0.99	0.97
48	0.91	1.00	0.97	0.96	1.00	0.85	1.00	0.95	0.95	0.92	0.98	0.95

### *Accuracy and Loss*

- 16: 0.9812, 0.0452
- 24: 0.9702, 0.0965
- 32: 0.9323, 0.1680
- 40: 0.9750, 0.0596
- 48: 0.9531, 0.1211

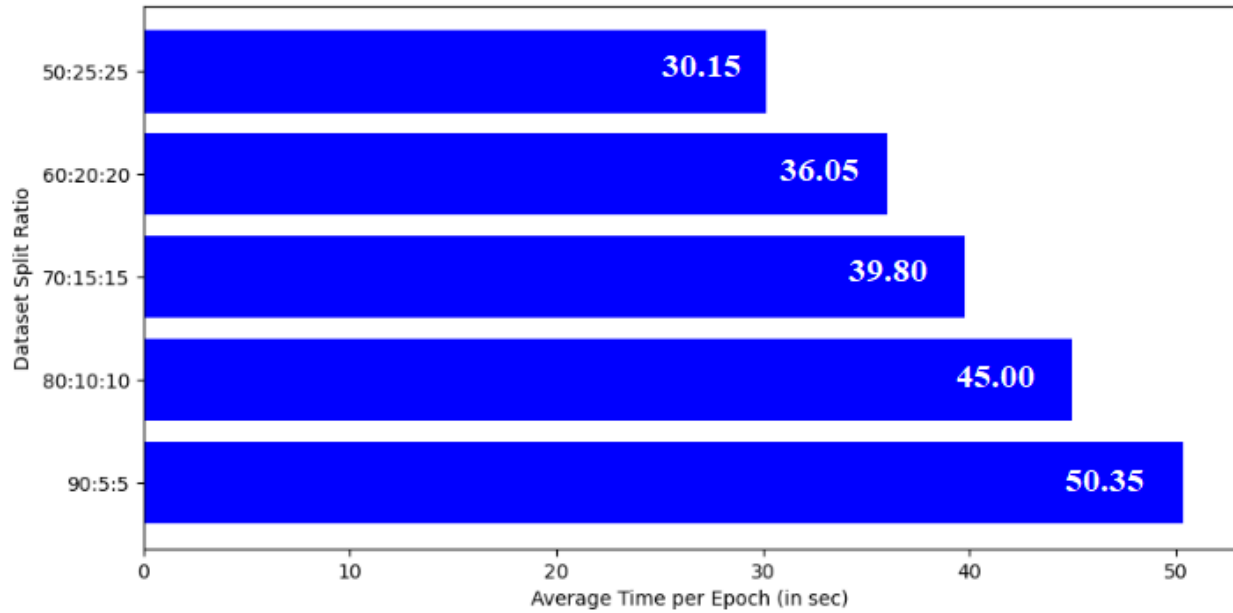




## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 50.35 s
- 80-10-10: 45.00 s
- 70-15-15: 39.80 s
- 60-20-20: 36.05 s
- 50-25-25: 30.15 s

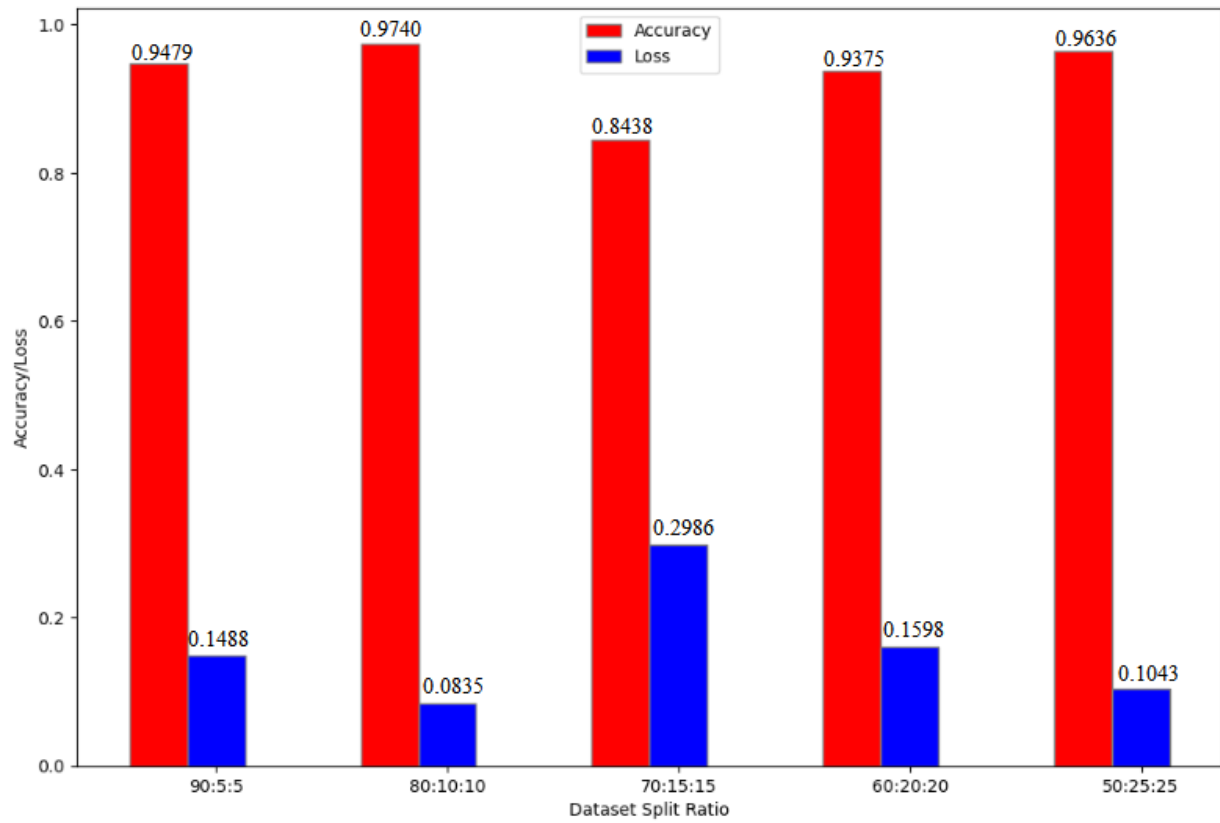


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	0.89	0.97	1.00	0.95	1.00	0.89	0.96	0.95	0.94	0.93	0.98	0.95
80:10:10	0.96	0.98	0.98	0.97	0.99	0.94	1.00	0.97	0.97	0.96	0.99	0.97
70:15:15	0.76	0.80	1.00	0.86	1.00	0.65	0.86	0.84	0.86	0.72	0.92	0.84
60:20:20	0.86	1.00	0.98	0.95	1.00	0.81	1.00	0.94	0.93	0.89	0.99	0.94
50:25:25	0.92	1.00	0.98	0.97	1.00	0.89	1.00	0.96	0.96	0.94	0.99	0.96

### *Accuracy and Loss*

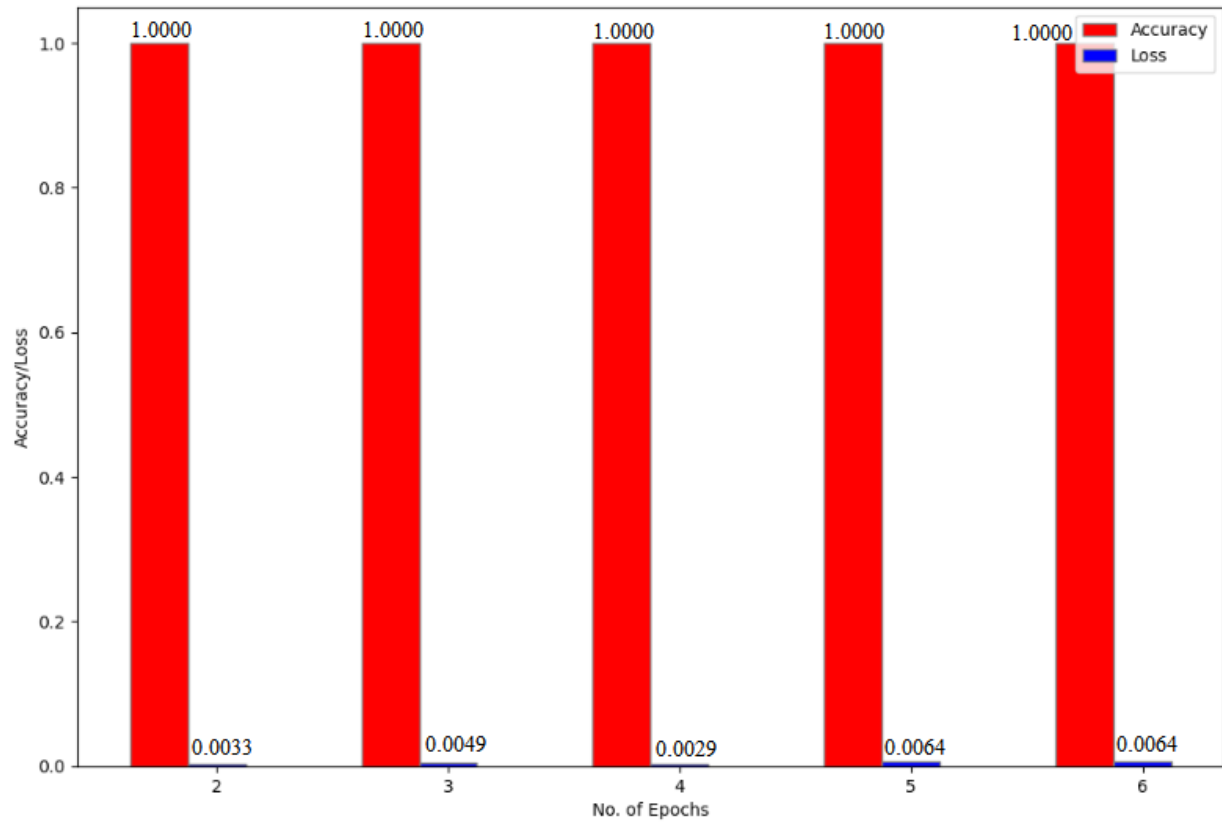
- 90-5-5: 0.9479, 0.1488
- 80-10-10: 0.9740, 0.0835
- 70-15-15: 0.8438, 0.2986
- 60-20-20: 0.9375, 0.1598
- 50-25-25: 0.9636, 0.1043





### *Accuracy and Loss*

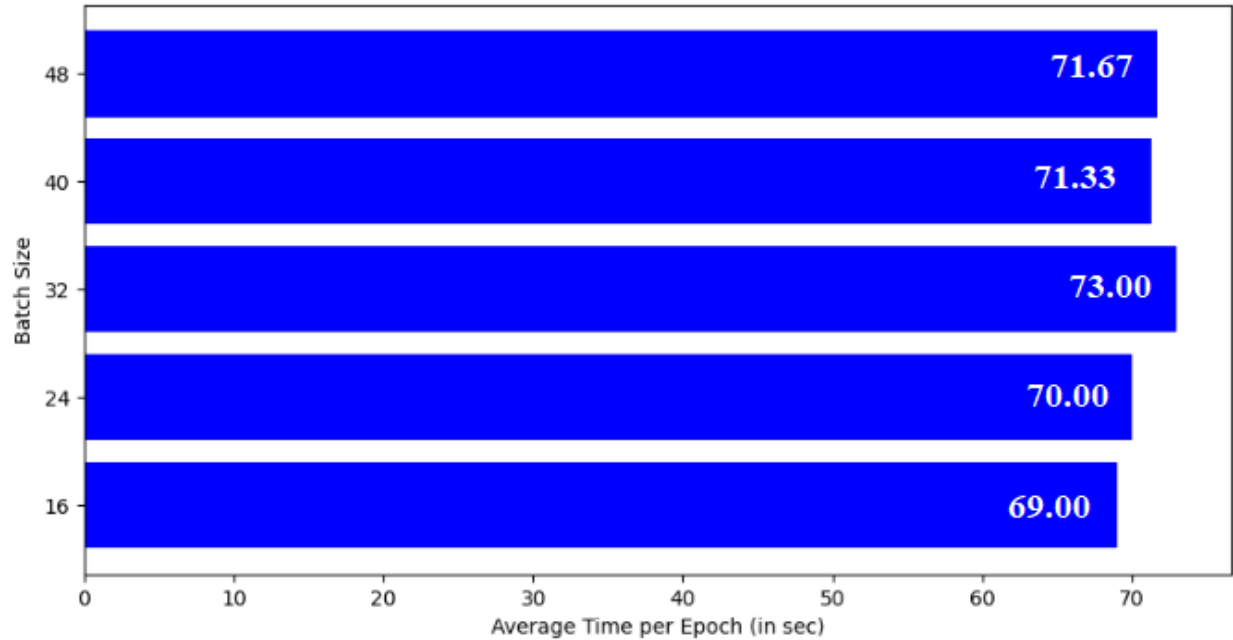
- 2: 1.0000, 0.0033
- 3: 1.0000, 0.0049
- 4: 1.0000, 0.0029
- 5: 1.0000, 0.0064
- 6: 1.0000, 0.0064



## Batch Size

### *Average Time per Epoch*

- 16: 69.00 s
- 24: 70.00 s
- 32: 73.00 s
- 40: 71.33 s
- 48: 71.67 s

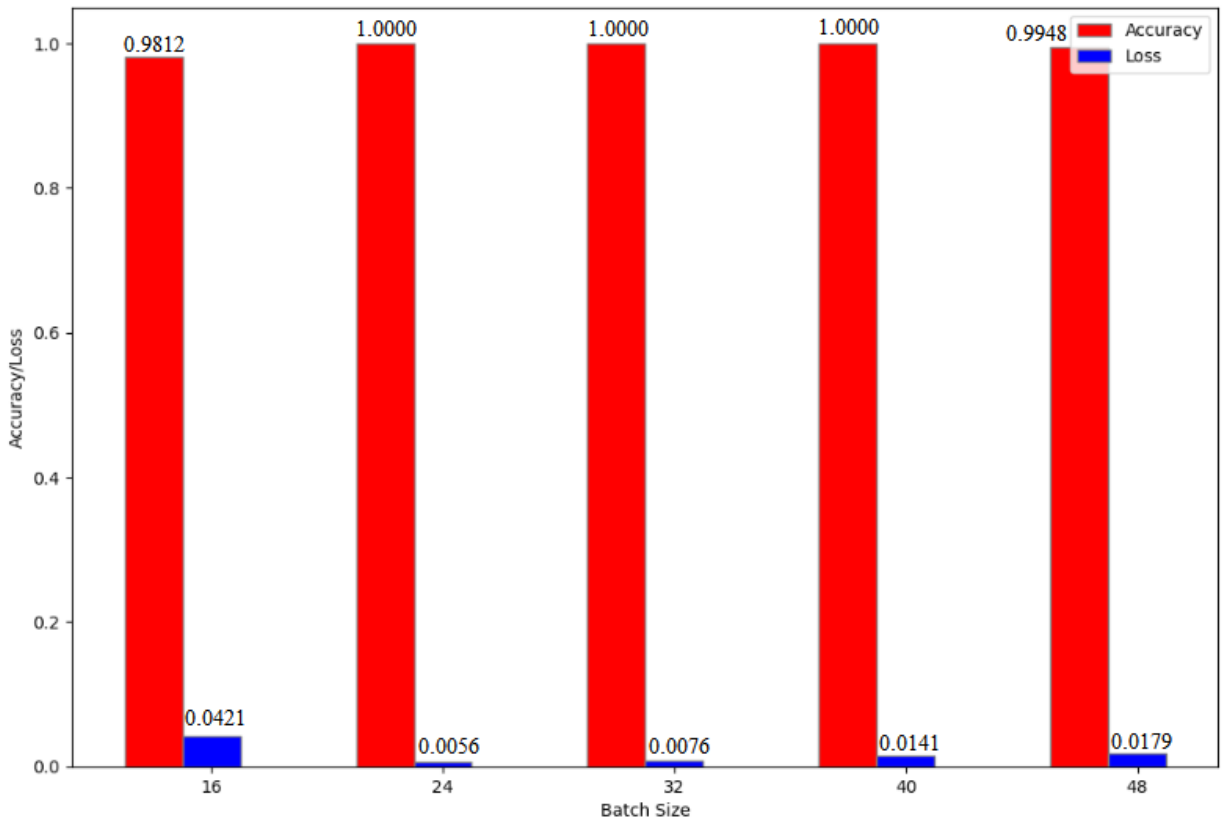


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Batch Size	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
16	1.00	0.95	1.00	0.98	0.96	1.00	0.98	0.98	0.98	0.97	0.99	0.98
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
32	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
48	1.00	0.99	1.00	0.99	0.98	1.00	1.00	0.99	0.99	0.99	1.00	0.99

### *Accuracy and Loss*

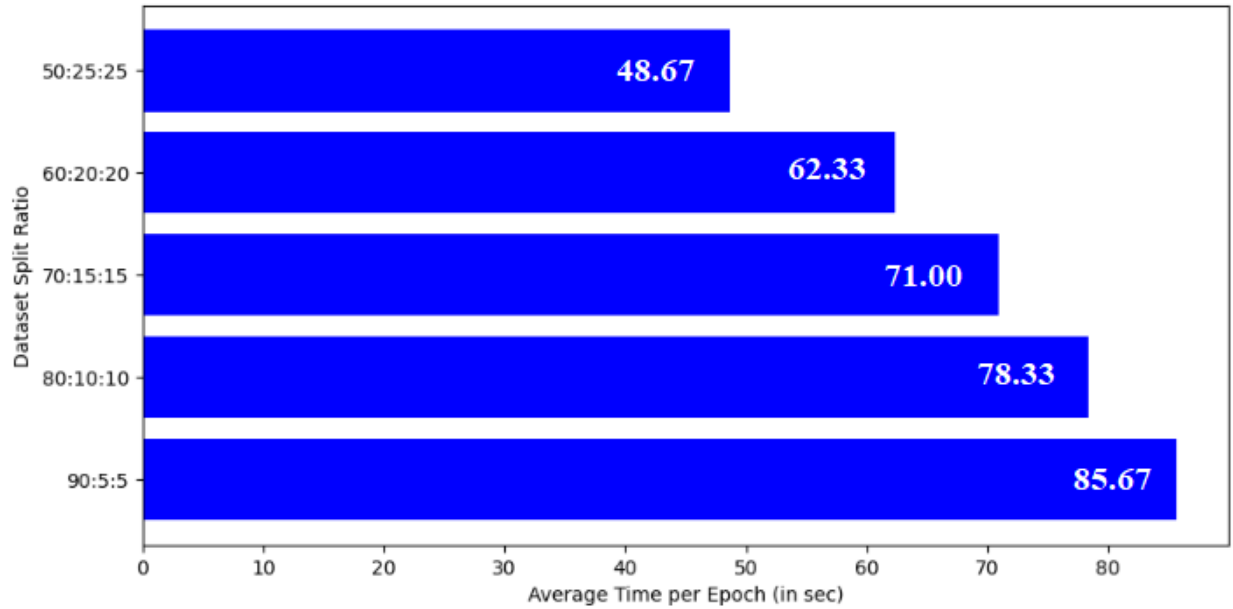
- 16: 0.9812, 0.0421
- 24: 1.0000, 0.0056
- 32: 1.0000, 0.0076
- 40: 1.0000, 0.0141
- 48: 0.9948, 0.0179



## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 85.67 s
- 80-10-10: 78.33 s
- 70-15-15: 71.00 s
- 60-20-20: 62.33 s
- 50-25-25: 48.67 s

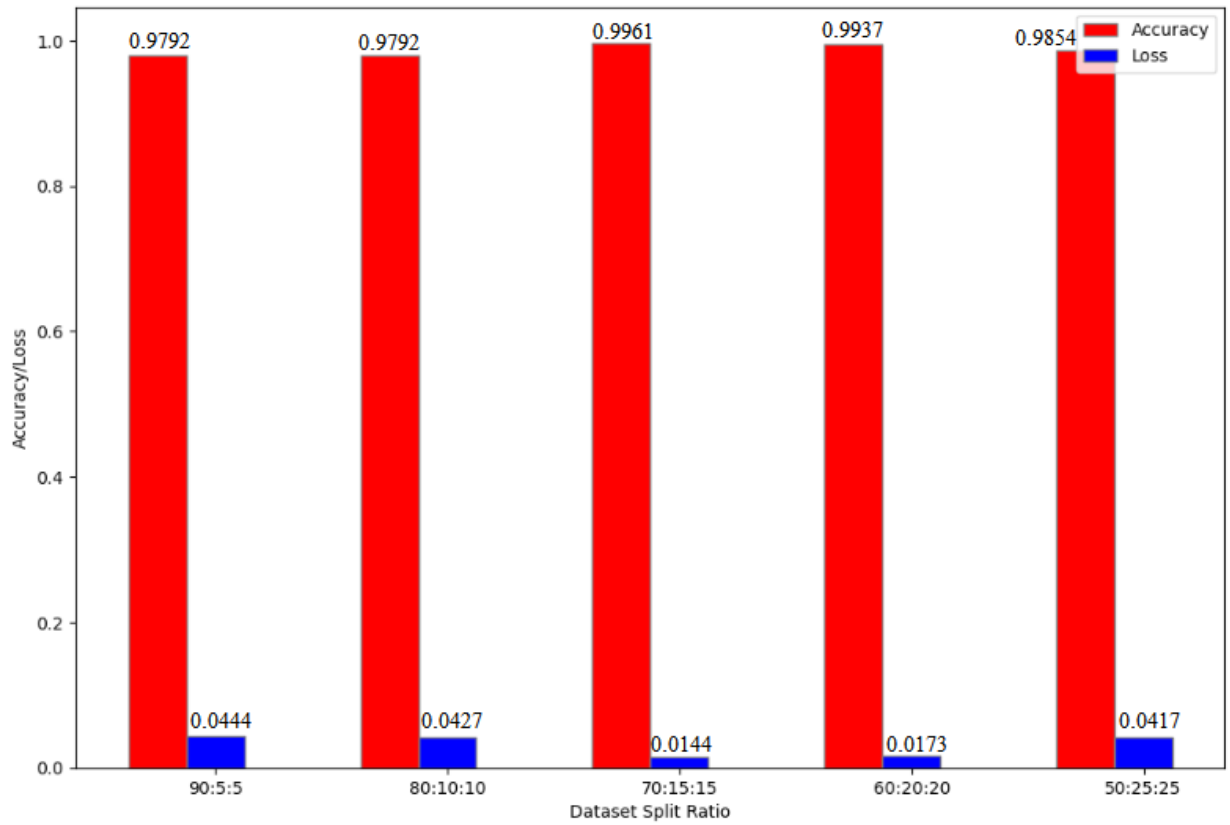


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	1.00	0.94	1.00	0.98	0.97	1.00	0.96	0.98	0.99	0.97	0.98	0.98
80:10:10	1.00	1.00	0.95	0.98	1.00	0.93	1.00	0.98	1.00	0.96	0.97	0.98
70:15:15	1.00	0.99	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	0.99	1.00
60:20:20	1.00	1.00	0.98	0.99	1.00	0.98	1.00	0.99	1.00	0.99	0.99	0.99
50:25:25	1.00	0.96	1.00	0.99	0.98	1.00	0.98	0.99	0.99	0.98	0.99	0.99

### *Accuracy and Loss*

- 90-5-5: 0.9792, 0.0444
- 80-10-10: 0.9792, 0.0427
- 70-15-15: 0.9961, 0.0144
- 60-20-20: 0.9937, 0.0173
- 50-25-25: 0.9854, 0.0417



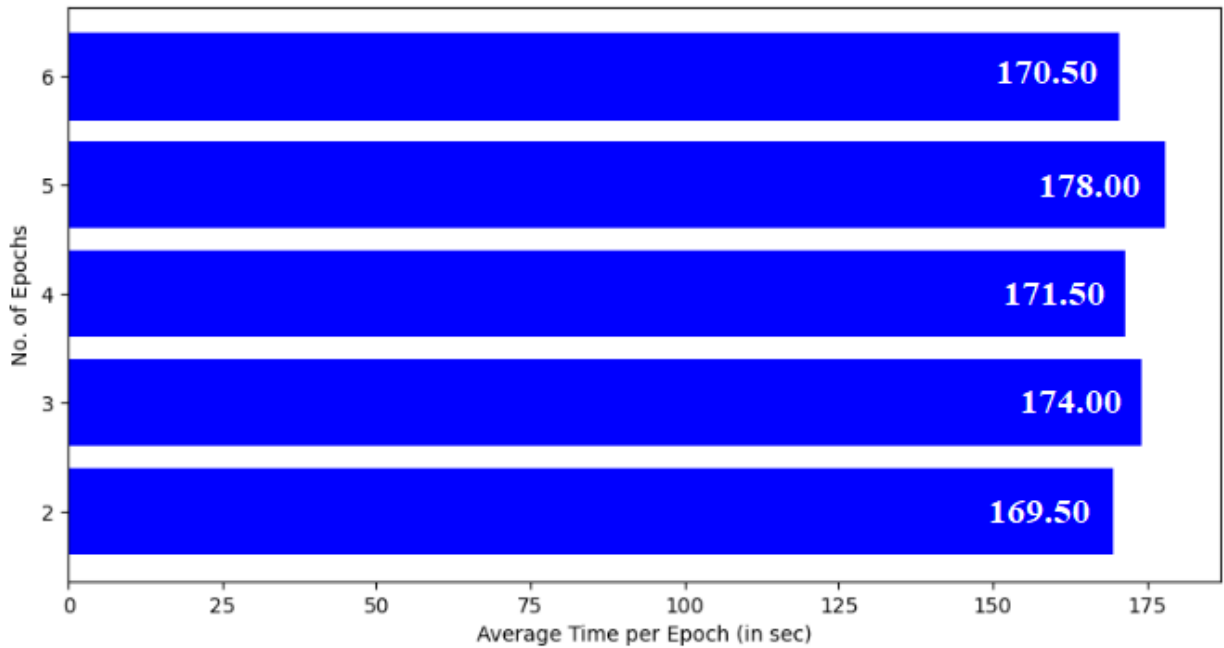


### MODEL 3: VGG16

#### No. of Epochs

##### *Average Time per Epoch*

- 2: 169.50 s
- 3: 174.00 s
- 4: 171.50 s
- 5: 178.00 s
- 6: 170.50 s

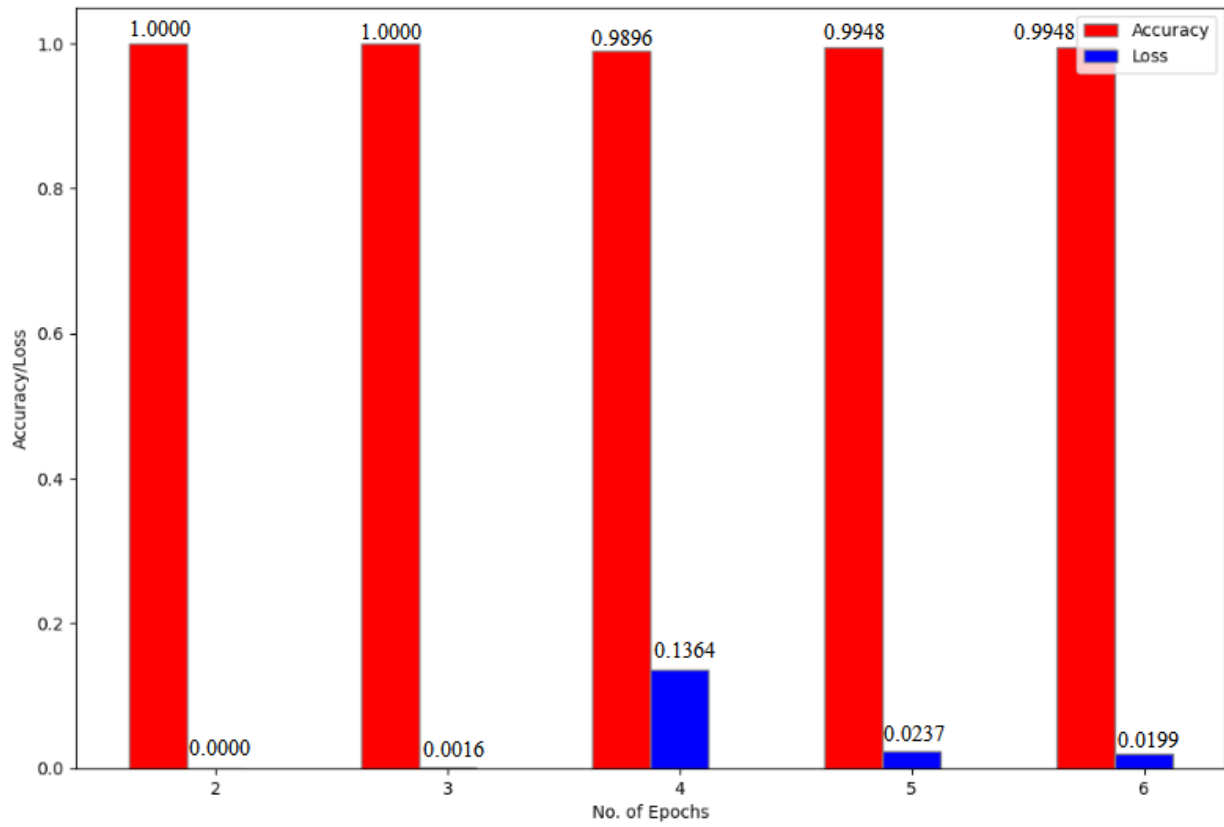


##### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	0.99	0.98	1.00	0.99	0.99	0.98	1.00	0.99	0.99	0.98	1.00	0.99
5	0.98	1.00	1.00	0.99	1.00	0.98	1.00	0.99	0.99	0.99	1.00	0.99
6	0.98	1.00	1.00	0.99	1.00	0.98	1.00	0.99	0.99	0.99	1.00	0.99

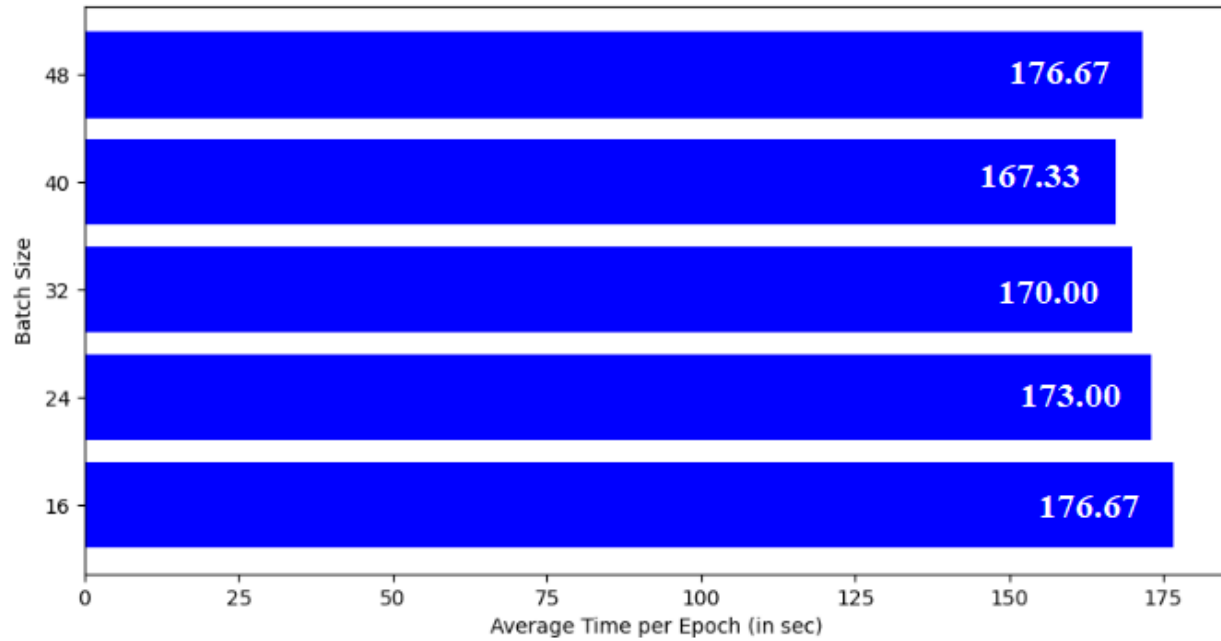
### *Accuracy and Loss*

- 2: 1.0000, 0.0000
- 3: 1.0000, 0.0016
- 4: 0.9896, 0.1364
- 5: 0.9948, 0.0237
- 6: 0.9948, 0.0199



### Average Time per Epoch

- 16: 176.67 s
- 24: 173.00 s
- 32: 170.00 s
- 40: 167.33 s
- 48: 171.67 s

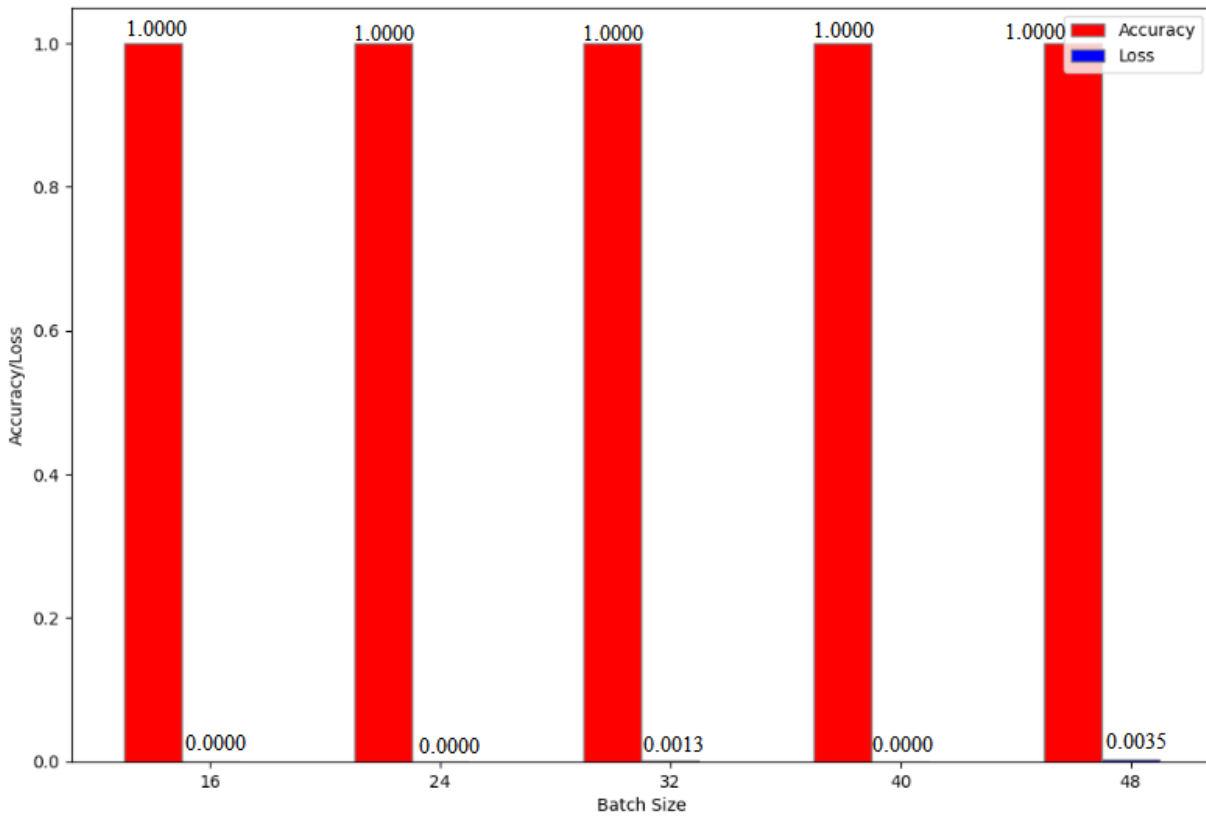


**Precision, Recall, f1 Score** (0: Early Blight, 1: Late Blight, 2: Healthy)

[illegible]

### *Accuracy and Loss*

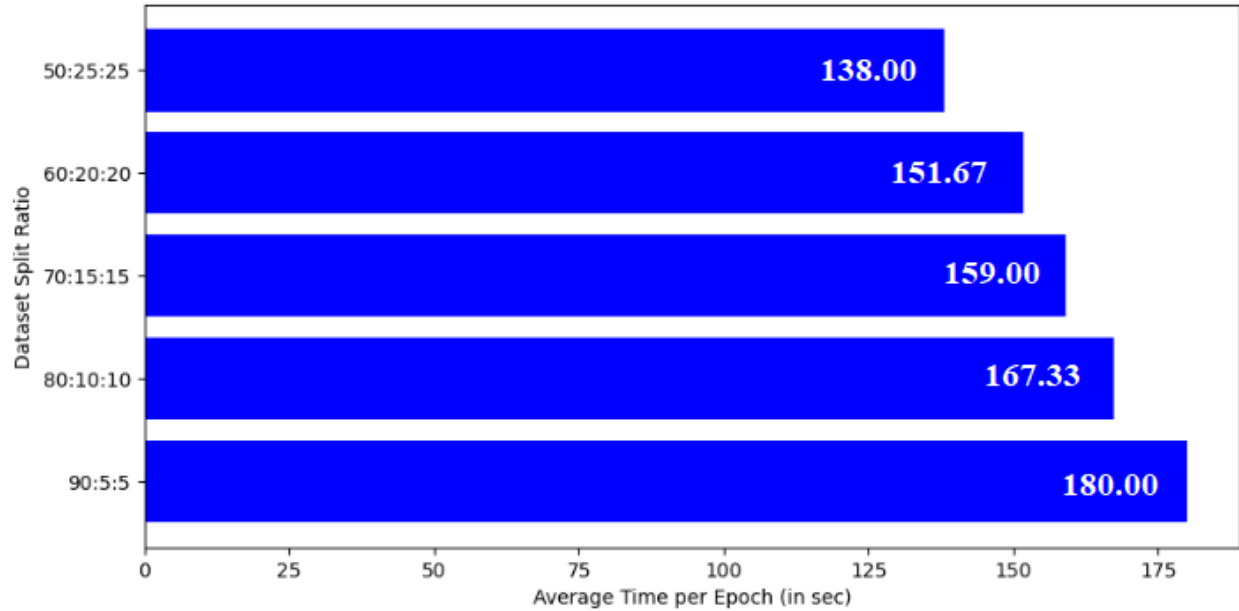
- 16: 1.0000, 0.0000
- 24: 1.0000, 0.0000
- 32: 1.0000, 0.0013
- 40: 1.0000, 0.0000
- 48: 1.0000, 0.0035



## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 180.00 s
- 80-10-10: 167.33 s
- 70-15-15: 159.00 s
- 60-20-20: 151.67 s
- 50-25-25: 138.00 s

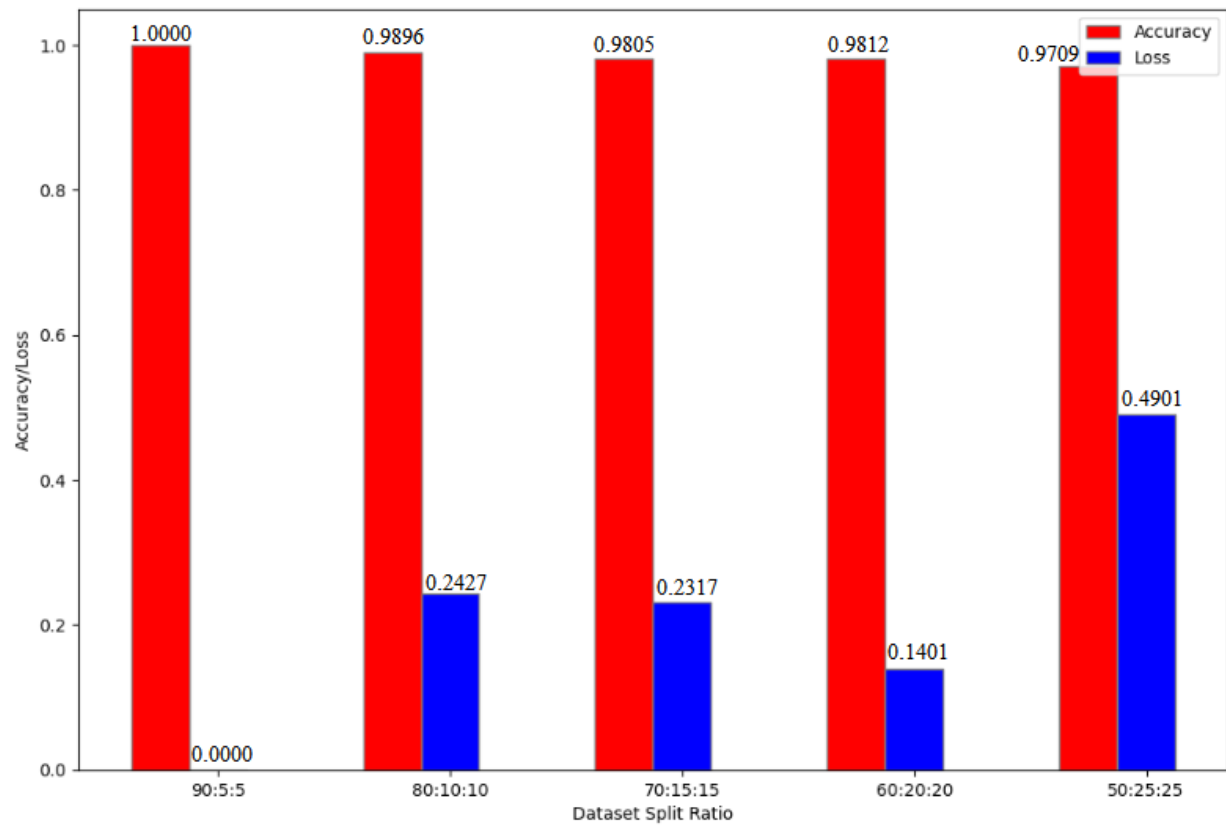


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80:10:10	1.00	0.97	1.00	0.99	1.00	1.00	0.97	0.99	1.00	0.99	0.99	0.99
70:15:15	0.97	0.97	1.00	0.98	0.96	0.98	1.00	0.98	0.97	0.97	1.00	0.98
60:20:20	0.96	0.99	0.99	0.98	1.00	0.96	0.99	0.98	0.98	0.97	0.99	0.98
50:25:25	0.96	0.99	0.97	0.97	0.98	0.93	1.00	0.97	0.97	0.96	0.98	0.97

### *Accuracy and Loss*

- 90-5-5: 1.0000, 0.0000
- 80-10-10: 0.9896, 0.2427
- 70-15-15: 0.9805, 0.2317
- 60-20-20: 0.9812, 0.1401
- 50-25-25: 0.9709, 0.4901

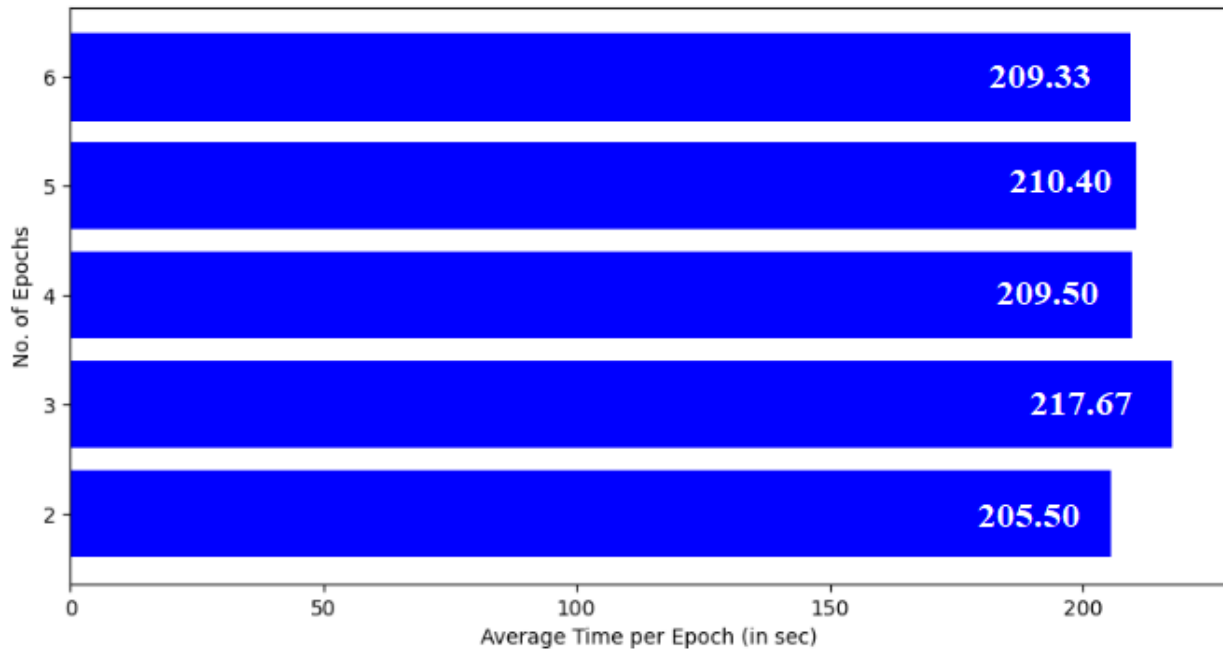


## MODEL 4: VGG19

### No. of Epochs

#### *Average Time per Epoch*

- 2: 205.50 s
- 3: 217.67 s
- 4: 209.50 s
- 5: 210.40 s
- 6: 209.33 s

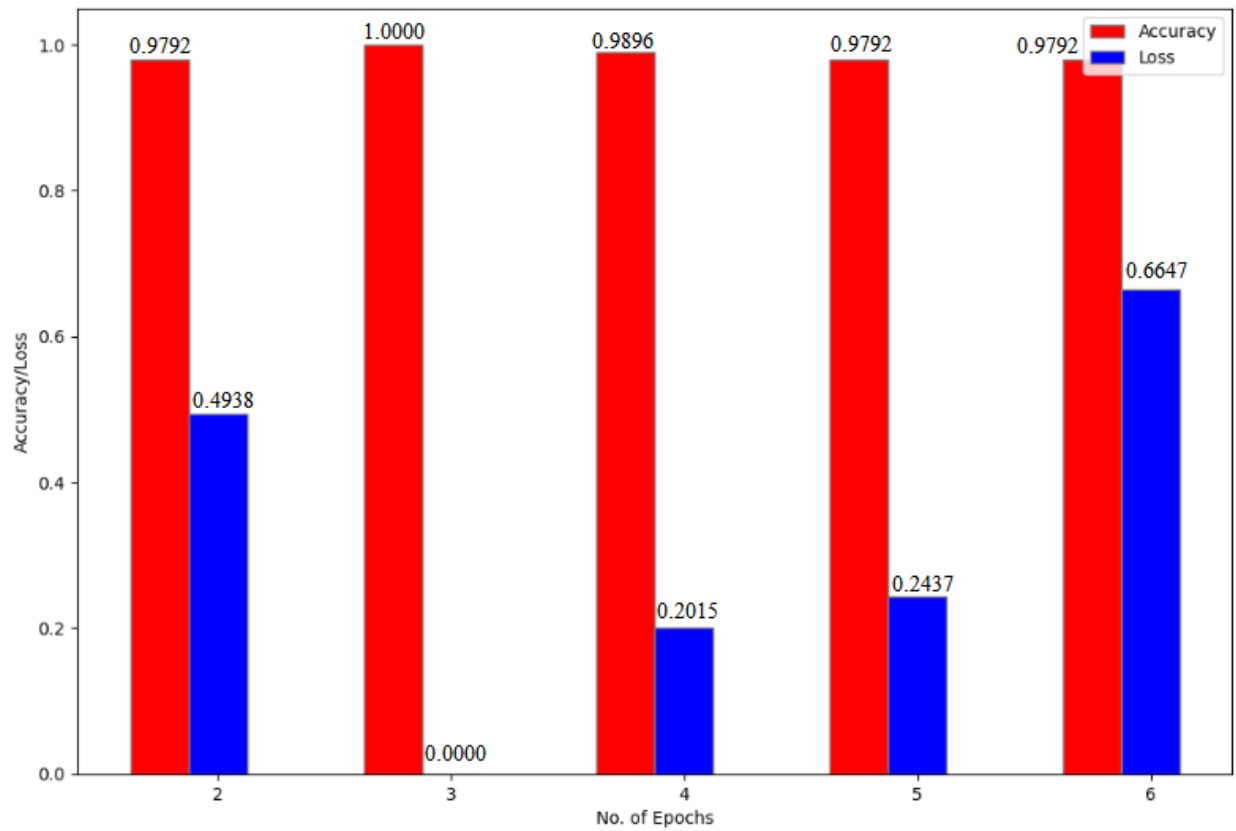


#### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
2	1.00	0.97	0.97	0.98	0.95	0.99	1.00	0.98	0.97	0.98	0.98	0.98
3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	0.99	1.00	0.99	0.99	1.00	0.96	1.00	0.99	0.99	0.98	0.99	0.99
5	0.98	0.97	0.98	0.98	0.97	0.97	1.00	0.98	0.98	0.97	0.99	0.98
6	0.95	1.00	0.99	0.98	1.00	0.93	1.00	0.98	0.97	0.97	0.99	0.98

### *Accuracy and Loss*

- 2: 0.9792, 0.4938
- 3: 1.0000, 0.0000
- 4: 0.9896, 0.2015
- 5: 0.9792, 0.2437
- 6: 0.9792, 0.6647

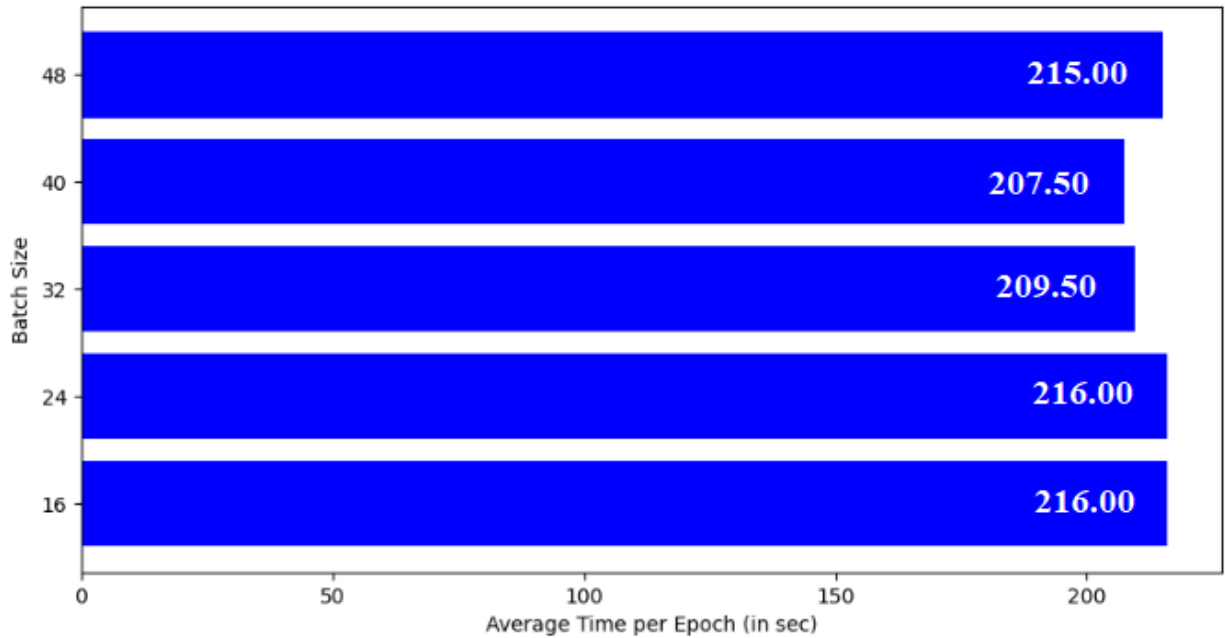




## Batch Size

### *Average Time per Epoch*

- 16: 216.00
- 24: 216.00
- 32: 209.50
- 40: 207.50
- 48: 215.00

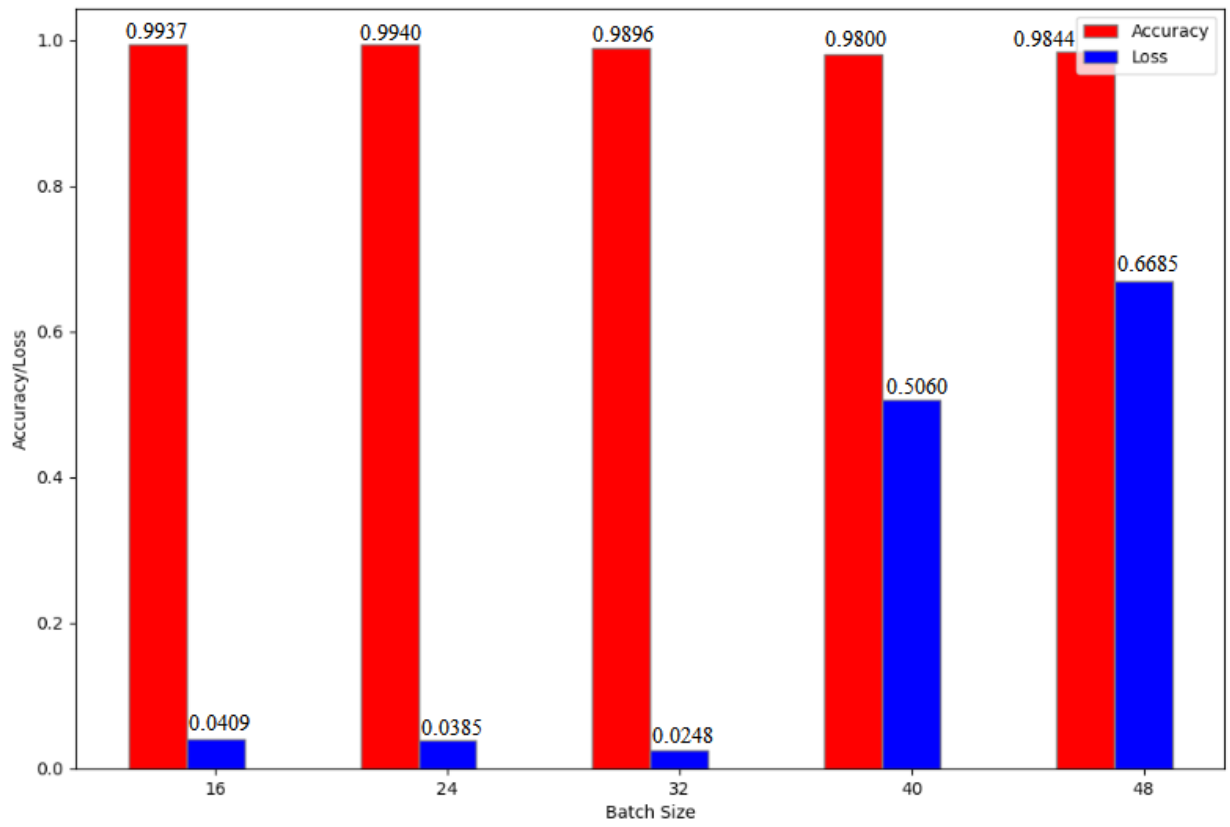


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Batch Size	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
16	1.00	1.00	0.98	0.99	1.00	0.98	1.00	0.99	1.00	0.99	0.99	0.99
24	1.00	0.98	1.00	0.99	0.99	1.00	1.00	0.99	0.99	0.99	1.00	0.99
32	1.00	0.97	1.00	0.99	0.98	1.00	0.98	0.99	0.99	0.99	0.99	0.99
40	1.00	1.00	0.94	0.98	1.00	0.94	1.00	0.98	1.00	0.97	0.97	0.98
48	0.97	0.99	1.00	0.98	1.00	0.97	0.99	0.98	0.98	0.98	0.99	0.98

### *Accuracy and Loss*

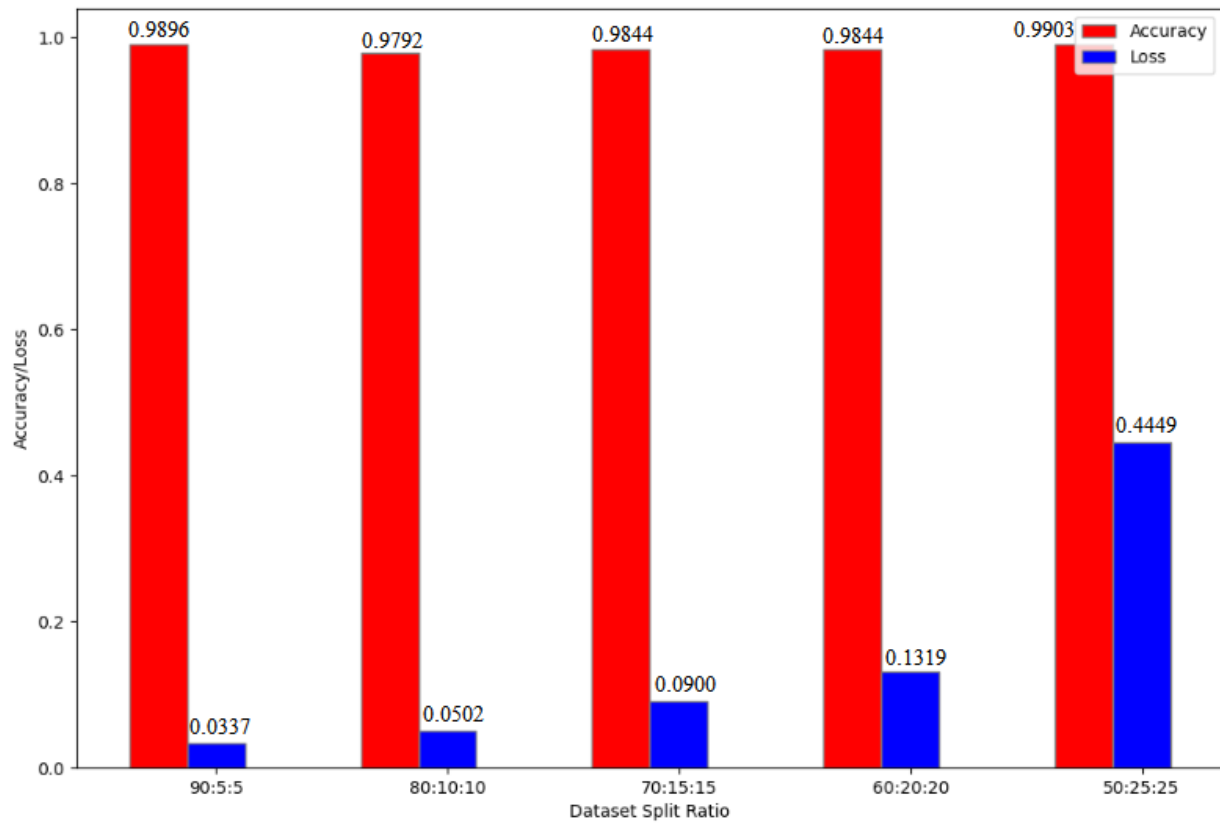
- 16: 0.9937, 0.0409
- 24: 0.9940, 0.0385
- 32: 0.9896, 0.0248
- 40: 0.9800, 0.5060
- 48: 0.9844, 0.6685





### *Accuracy and Loss*

- 90-5-5: 0.9896, 0.0337
- 80-10-10: 0.9792, 0.0502
- 70-15-15: 0.9844, 0.0900
- 60-20-20: 0.9844, 0.1319
- 50-25-25: 0.9903, 0.4449

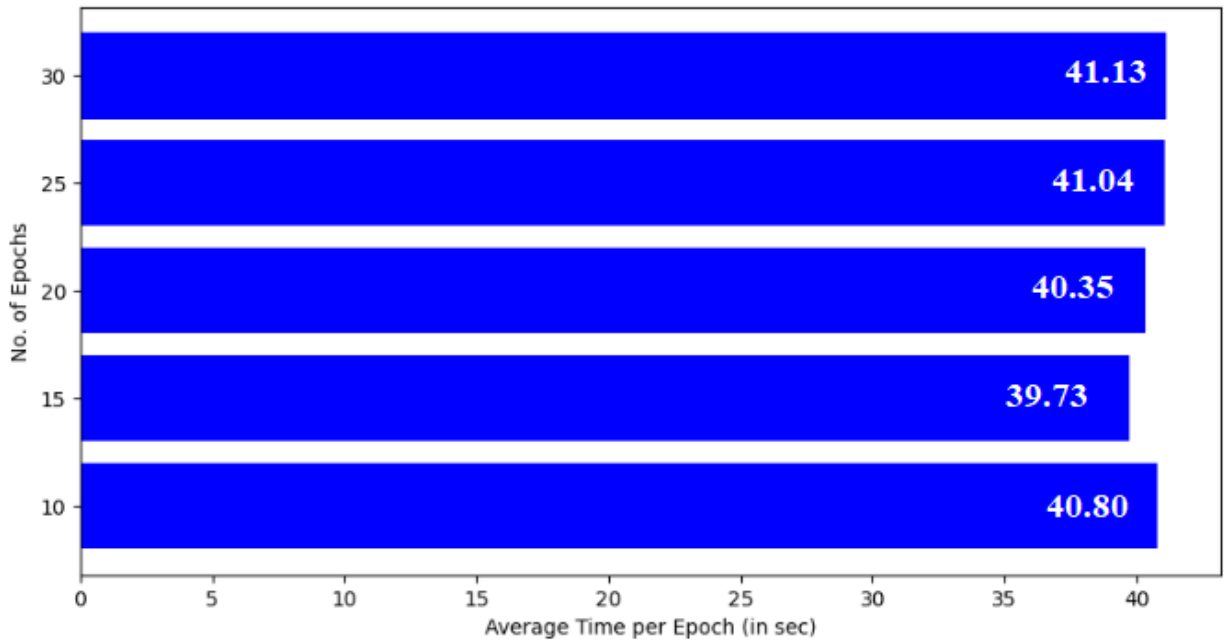


## MODEL 5: InceptionV3

### No. of Epochs

#### *Average Time per Epoch*

- 10: 40.80 s
- 15: 39.73 s
- 20: 40.35 s
- 25: 41.04 s
- 30: 41.13 s

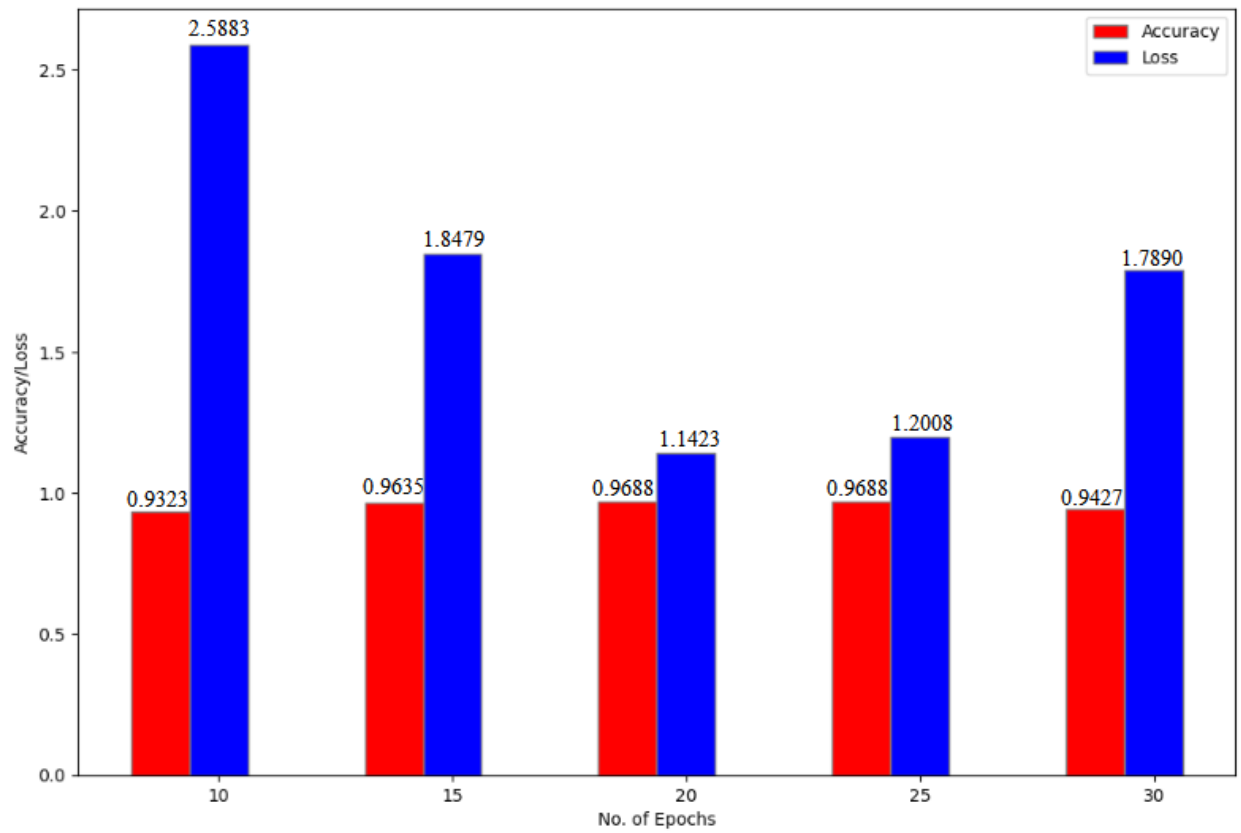


#### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
10	0.94	0.88	0.98	0.94	0.97	0.97	0.87	0.93	0.95	0.92	0.92	0.93
15	0.98	0.91	0.99	0.96	0.96	0.96	0.96	0.96	0.97	0.93	0.98	0.96
20	0.97	0.98	0.96	0.97	0.97	0.95	0.99	0.97	0.97	0.97	0.97	0.97
25	0.97	0.95	0.98	0.97	1.00	0.95	0.95	0.97	0.98	0.95	0.97	0.97
30	0.99	0.94	0.90	0.94	0.97	0.86	0.98	0.94	0.98	0.90	0.94	0.94

### *Accuracy and Loss*

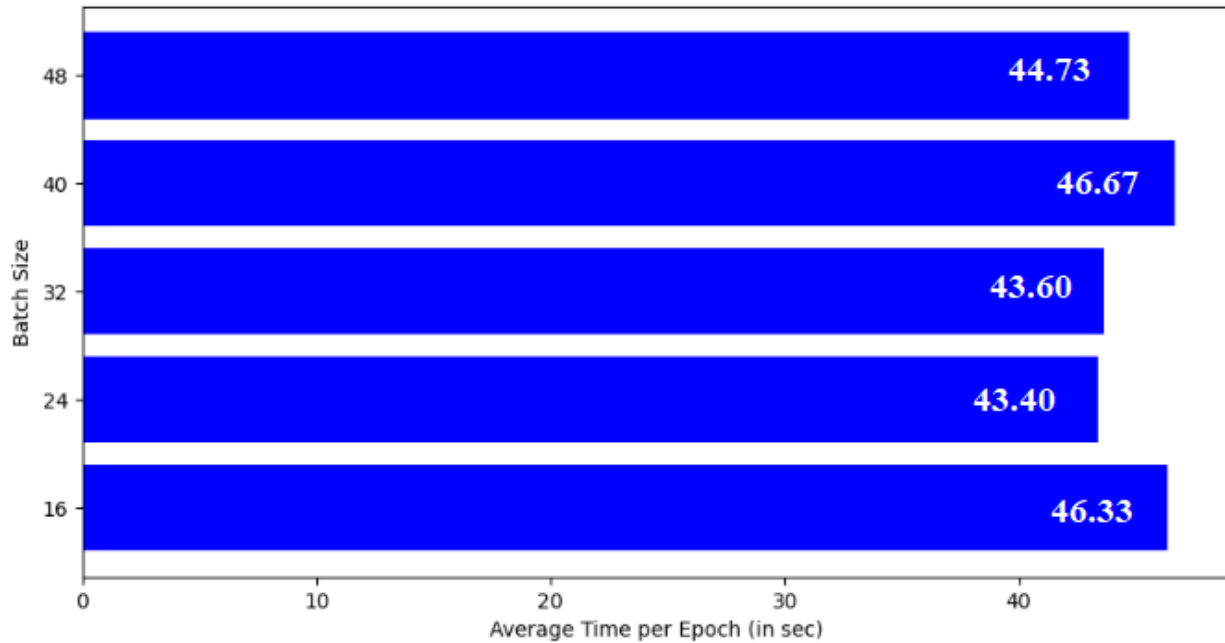
- 10: 0.9323, 2.5883
- 15: 0.9635, 1.8479
- 20: 0.9688, 1.1423
- 25: 0.9688, 1.2008
- 30: 0.9427, 1.7890



## Batch Size

### *Average Time per Epoch*

- 16: 46.33 s
- 24: 43.40 s
- 32: 43.60 s
- 40: 46.67 s
- 48: 44.73 s

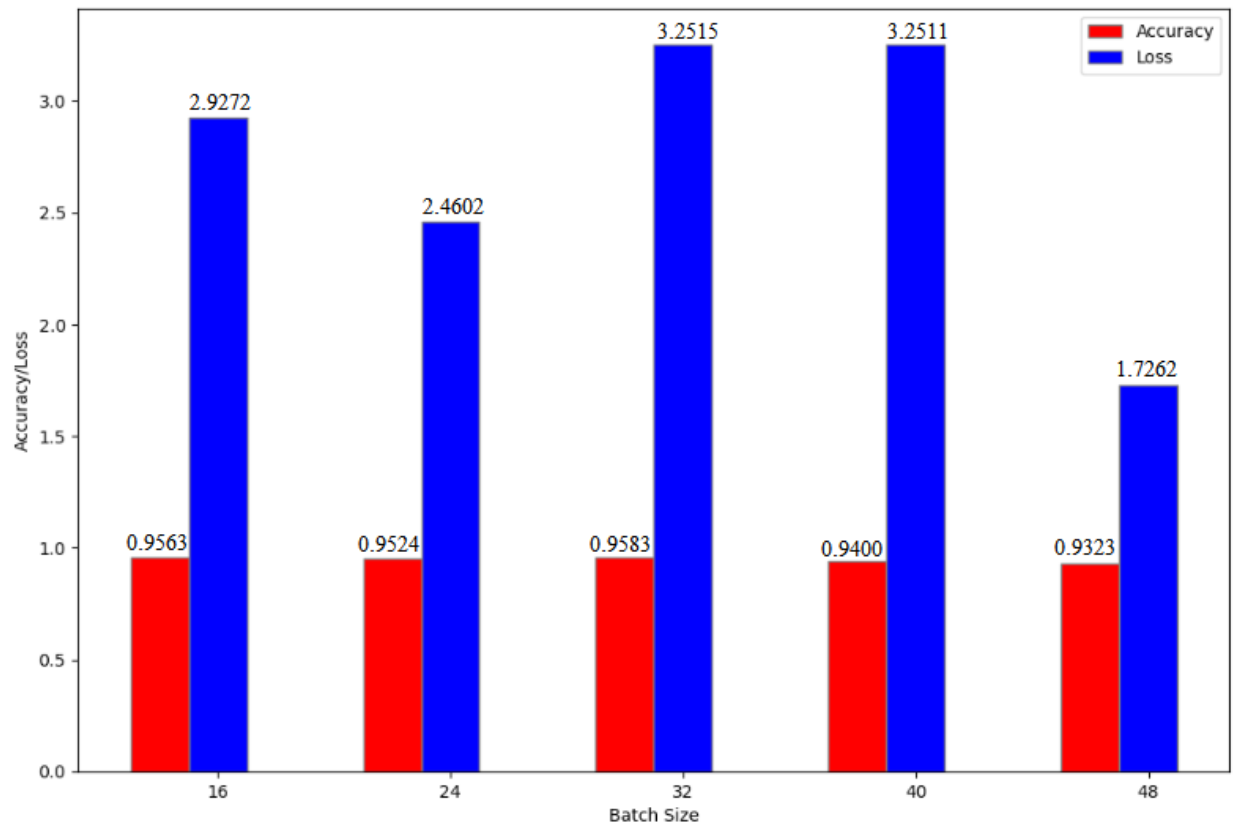


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Batch Size	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
16	0.98	0.89	1.00	0.96	1.00	0.98	0.89	0.96	0.99	0.93	0.94	0.96
24	1.00	0.95	0.92	0.95	0.96	0.91	0.98	0.95	0.98	0.93	0.95	0.95
32	0.98	0.94	0.95	0.96	0.95	0.95	0.97	0.96	0.97	0.95	0.96	0.96
40	1.00	0.84	0.98	0.95	0.96	0.98	0.89	0.94	0.98	0.91	0.93	0.94
48	0.96	0.92	0.92	0.93	0.95	0.91	0.94	0.93	0.95	0.92	0.93	0.93

### *Accuracy and Loss*

- 16: 0.9563, 2.9272
- 24: 0.9524, 2.4602
- 32: 0.9583, 3.2515
- 40: 0.9400, 3.2511
- 48: 0.9323, 1.7262

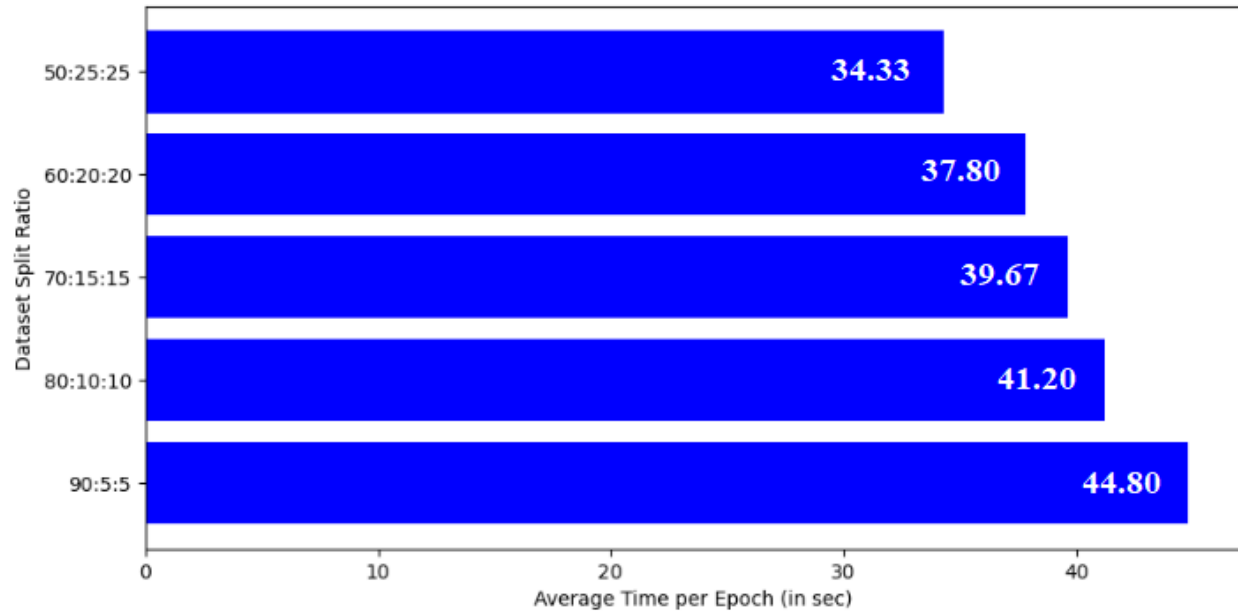




## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 44.80 s
- 80-10-10: 41.20 s
- 70-15-15: 39.67 s
- 60-20-20: 37.80 s
- 50-25-25: 34.33 s

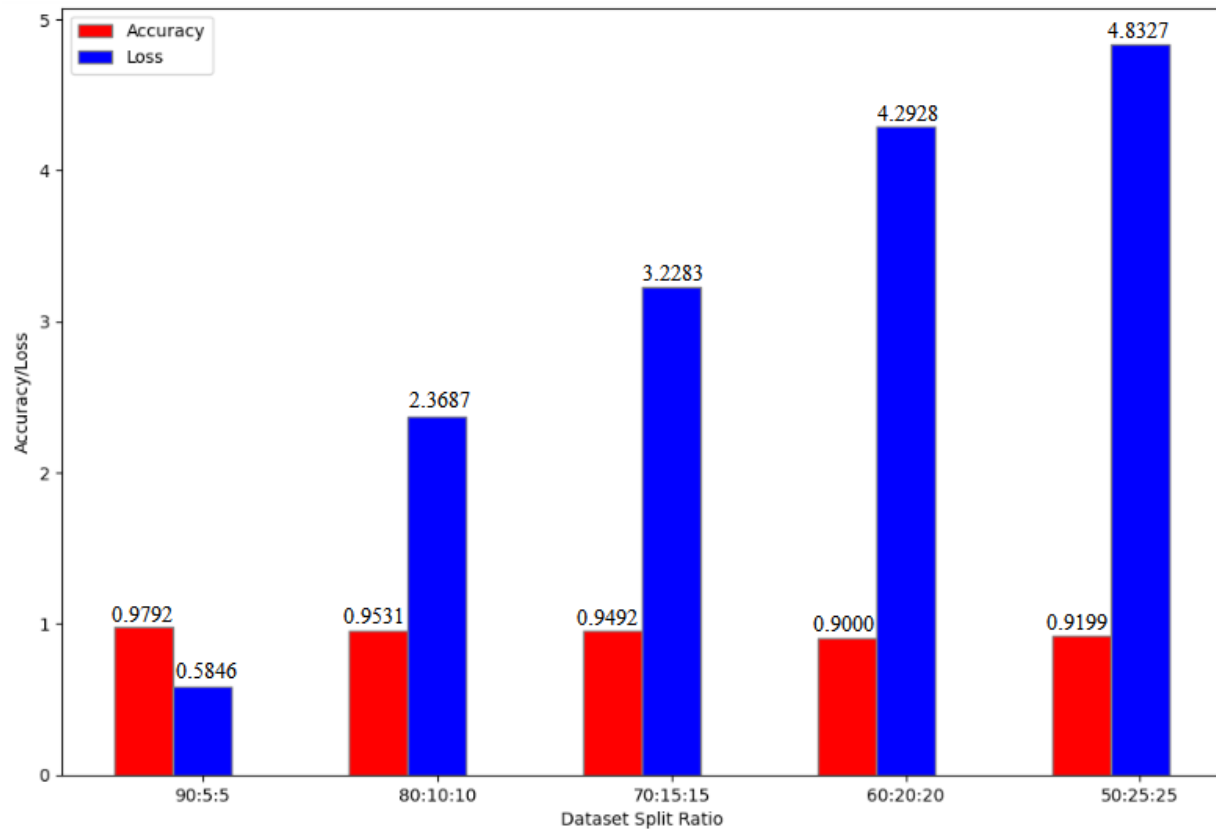


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	0.97	1.00	0.97	0.98	1.00	0.93	1.00	0.98	0.98	0.97	0.99	0.98
80:10:10	0.98	0.92	0.96	0.95	0.96	1.00	0.90	0.95	0.97	0.96	0.93	0.95
70:15:15	0.93	0.96	0.96	0.95	0.98	0.90	0.97	0.95	0.96	0.93	0.96	0.95
60:20:20	0.91	0.91	0.88	0.90	0.99	0.84	0.86	0.90	0.95	0.87	0.87	0.90
50:25:25	0.95	0.88	0.94	0.92	0.96	0.92	0.88	0.92	0.95	0.90	0.91	0.92

### *Accuracy and Loss*

- 90-5-5: 0.9792, 0.5846
- 80-10-10: 0.9531, 2.3687
- 70-15-15: 0.9492, 3.2283
- 60-20-20: 0.9000, 4.2928
- 50-25-25: 0.9199, 4.8327

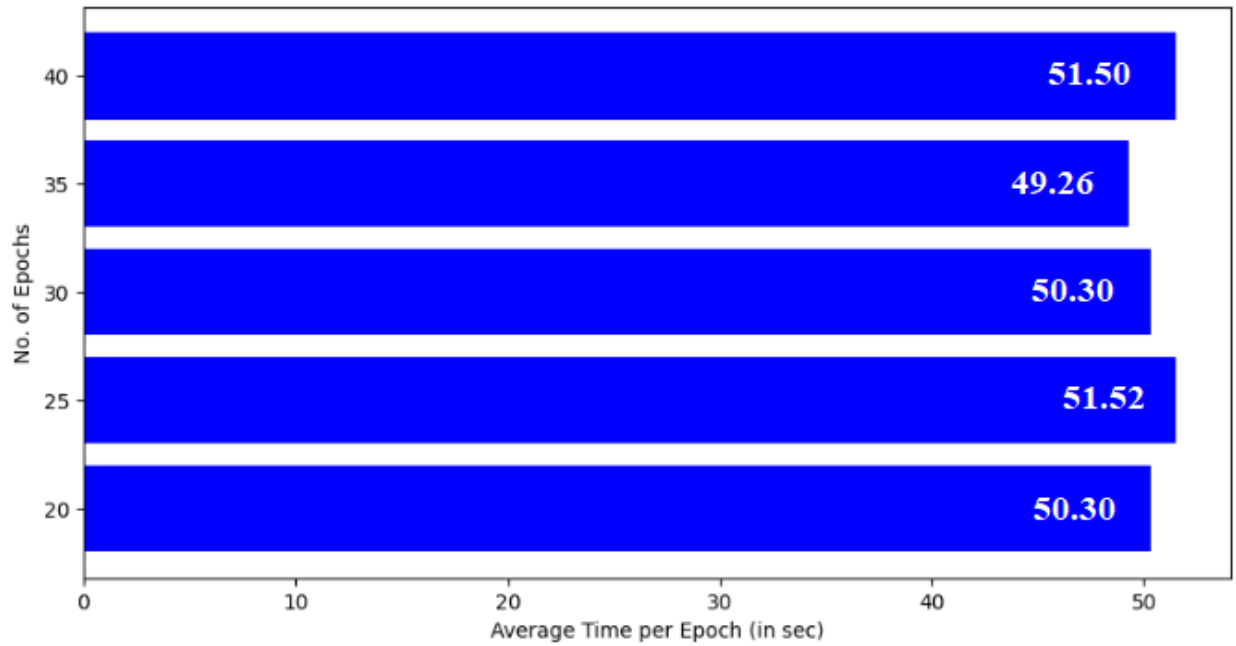


## MODEL 6: AlexNet

### No. of Epochs

#### *Average Time per Epoch*

- 20: 50.30 s
- 25: 51.52 s
- 30: 50.30 s
- 35: 49.26 s
- 40: 51.50 s

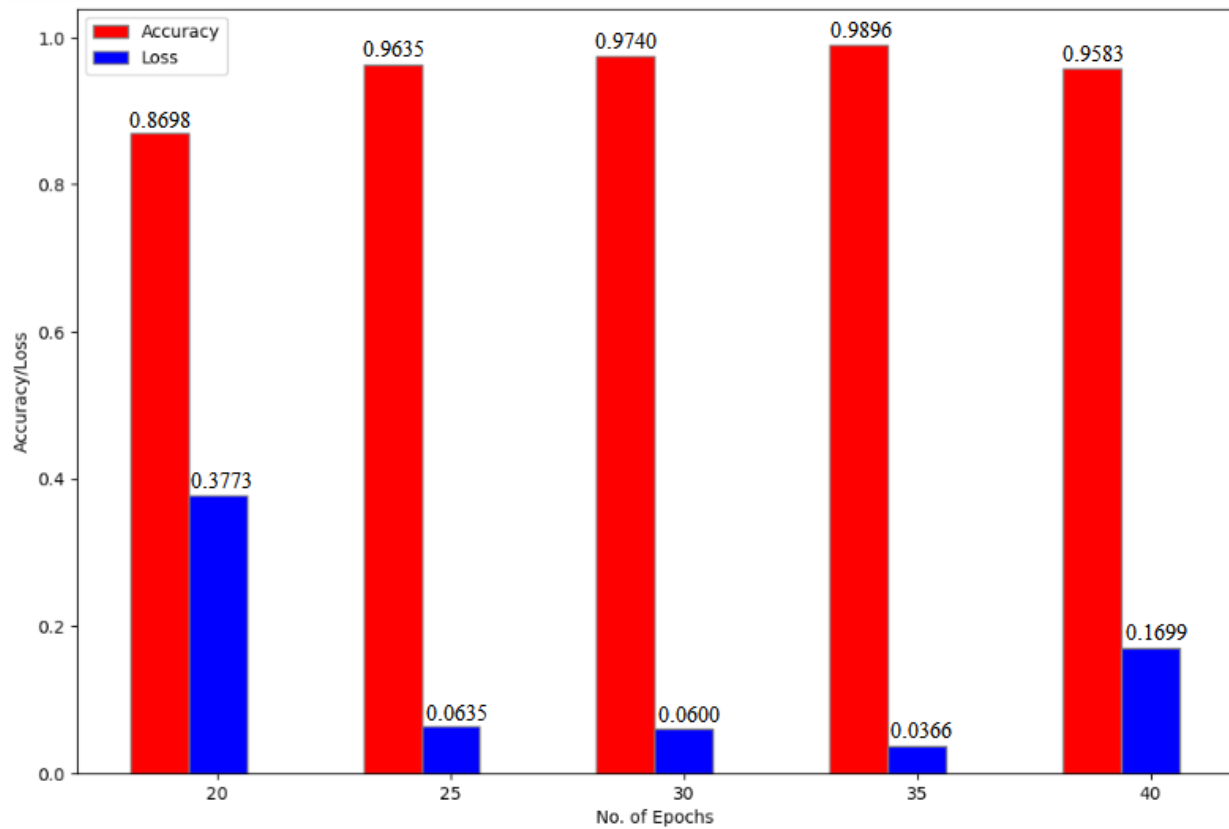


#### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

No. of Epochs	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
20	1.00	0.72	1.00	0.91	0.86	1.00	0.75	0.87	0.93	0.83	0.85	0.87
25	1.00	0.92	0.97	0.97	0.92	0.98	0.98	0.96	0.96	0.95	0.98	0.96
30	0.98	0.96	0.98	0.97	0.96	0.97	0.98	0.97	0.97	0.97	0.98	0.97
35	0.98	1.00	0.98	0.99	1.00	0.97	1.00	0.99	0.99	0.98	0.99	0.99
40	0.95	0.95	0.97	0.96	0.97	0.94	0.97	0.96	0.96	0.94	0.97	0.96

### *Accuracy and Loss*

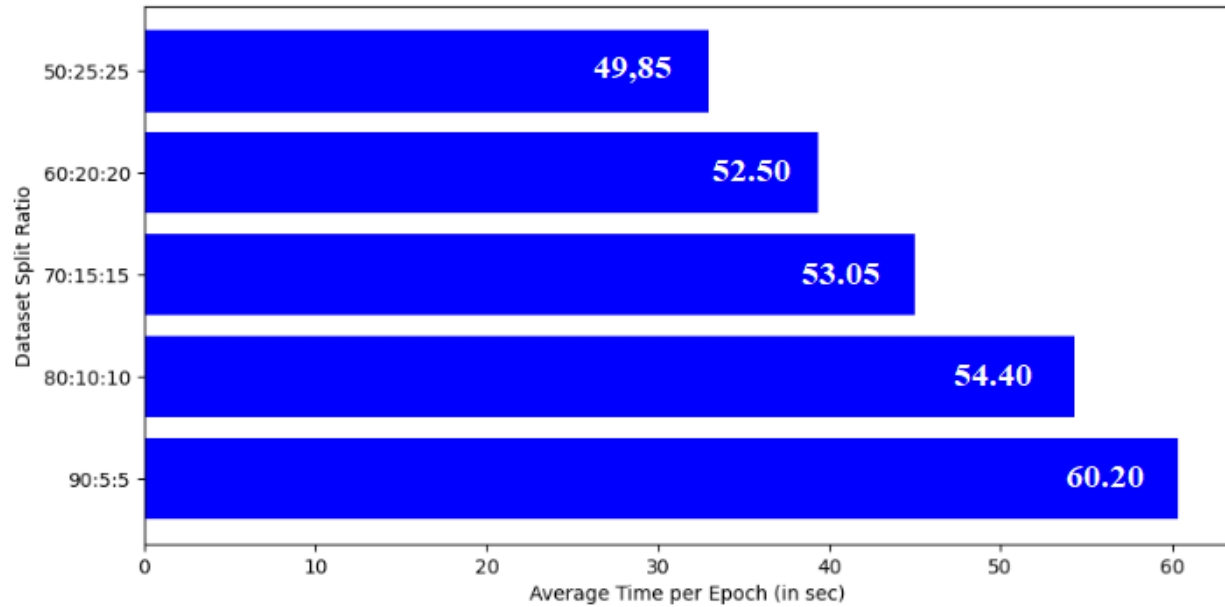
- 20: 0.8698, 0.3773
- 25: 0.9635, 0.0635
- 30: 0.9740, 0.0600
- 35: 0.9896, 0.0366
- 40: 0.9583, 0.1699



## Batch Size

### *Average Time per Epoch*

- 16: 60.20 s
- 24: 54.40 s
- 32: 53.05 s
- 40: 52.50 s
- 48: 49.85 s

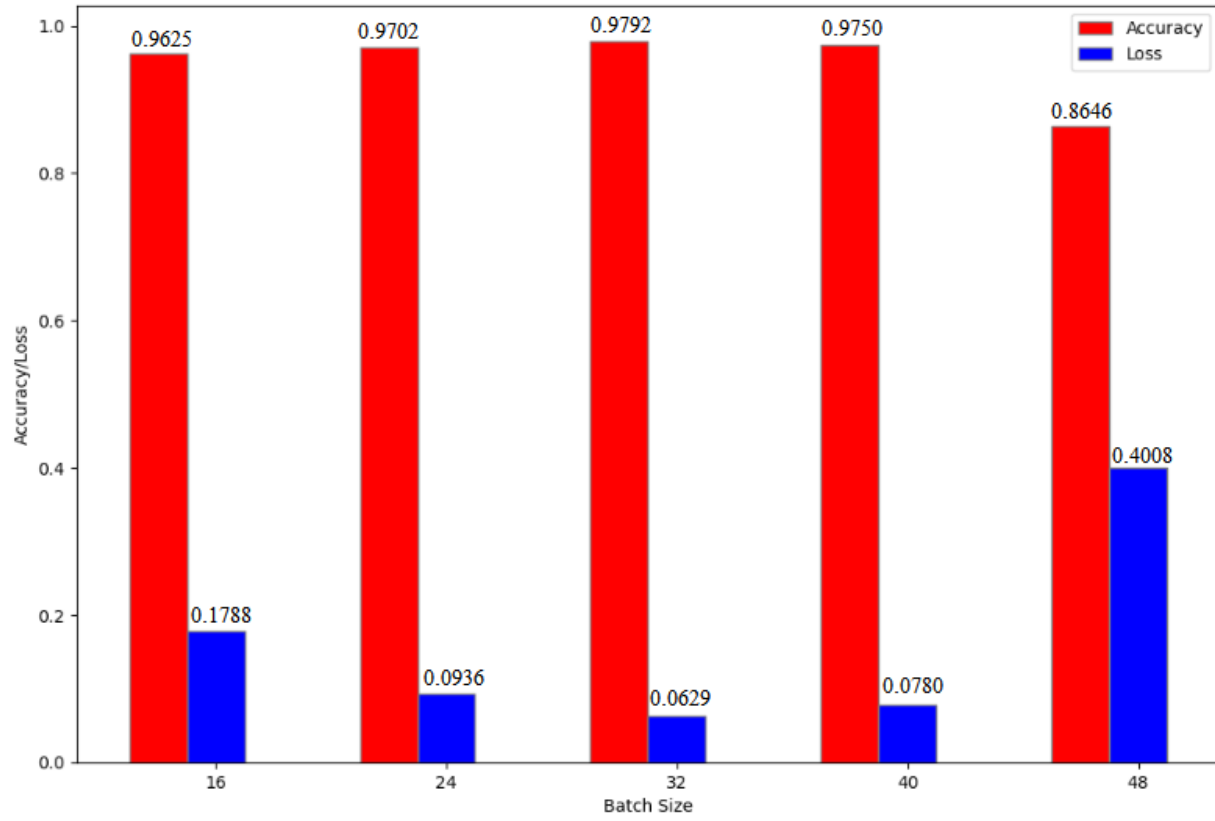


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Batch Size	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
16	0.94	0.98	0.97	0.96	0.98	0.91	1.00	0.96	0.96	0.94	0.98	0.96
24	1.00	0.96	0.96	0.97	0.98	0.97	0.96	0.97	0.99	0.96	0.96	0.97
32	1.00	0.94	1.00	0.98	0.97	1.00	0.97	0.98	0.98	0.97	0.99	0.98
40	1.00	0.94	1.00	0.98	0.94	1.00	0.98	0.97	0.97	0.97	0.99	0.98
48	1.00	0.69	0.98	0.90	0.81	1.00	0.81	0.86	0.89	0.91	0.89	0.87

### *Accuracy and Loss*

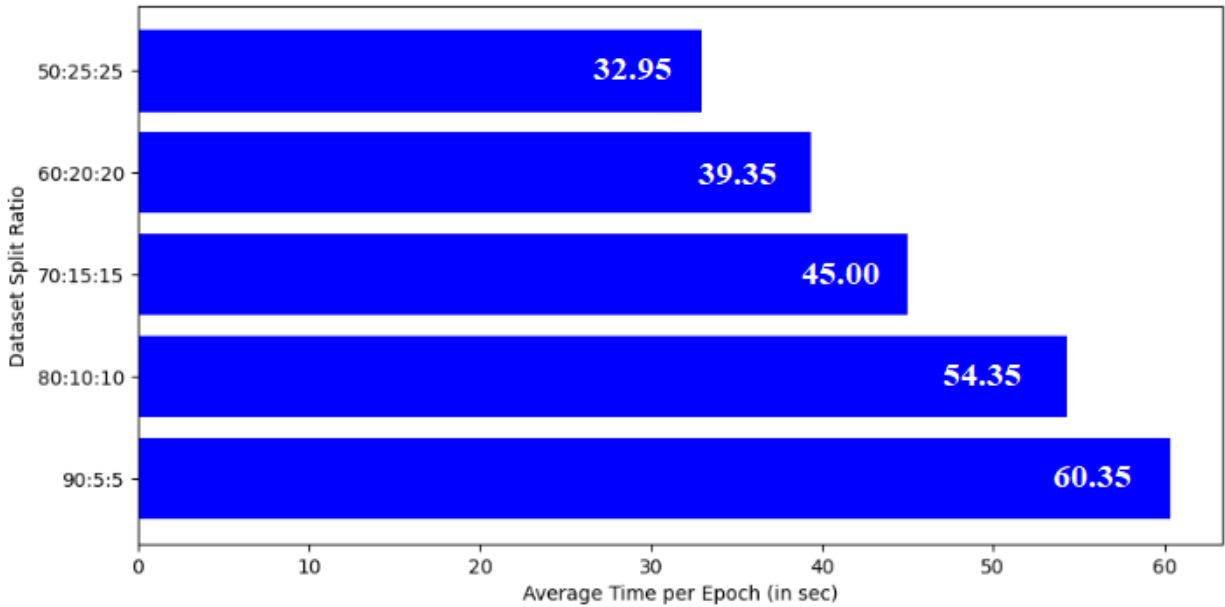
- 16: 0.9625, 0.1788
- 24: 0.9702, 0.0936
- 32: 0.9792, 0.0629
- 40: 0.9750, 0.0780
- 48: 0.8646, 0.4008



## Dataset Split Ratio

### *Average Time per Epoch*

- 90-5-5: 60.35 s
- 80-10-10: 54.35 s
- 70-15-15: 45.00 s
- 60-20-20: 39.35 s
- 50-25-25: 32.95 s

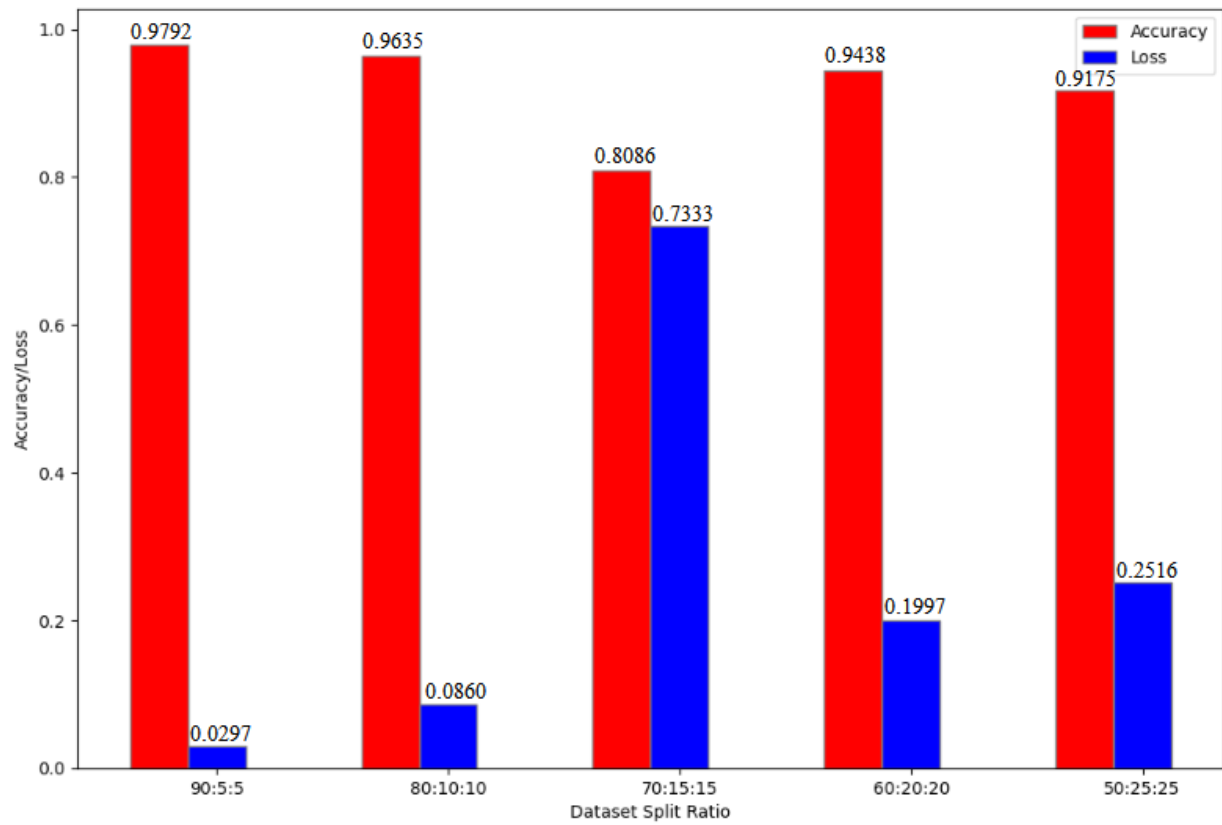


### *Precision, Recall, f1 Score (0: Early Blight, 1: Late Blight, 2: Healthy)*

Dataset Split Ratio	Precision				Recall				f1 Score			
	0	1	2	Weighted Average	0	1	2	Weighted Average	0	1	2	Weighted Average
90:5:5	1.00	0.98	0.97	0.98	1.00	0.98	0.97	0.98	1.00	0.98	0.97	0.98
80:10:10	1.00	0.91	0.98	0.97	0.97	0.98	0.94	0.96	0.98	0.95	0.96	0.96
70:15:15	0.98	0.65	1.00	0.87	0.75	0.99	0.67	0.81	0.85	0.79	0.80	0.81
60:20:20	0.94	0.94	0.95	0.94	0.95	0.92	0.96	0.94	0.95	0.93	0.95	0.94
50:25:25	0.99	0.81	0.99	0.93	0.82	0.99	0.95	0.92	0.90	0.89	0.97	0.92

### *Accuracy and Loss*

- 90-5-5: 0.9792, 0.0297
- 80-10-10: 0.9635, 0.0860
- 70-15-15: 0.8086, 0.7333
- 60-20-20: 0.9438, 0.1997
- 50-25-25: 0.9175, 0.2516

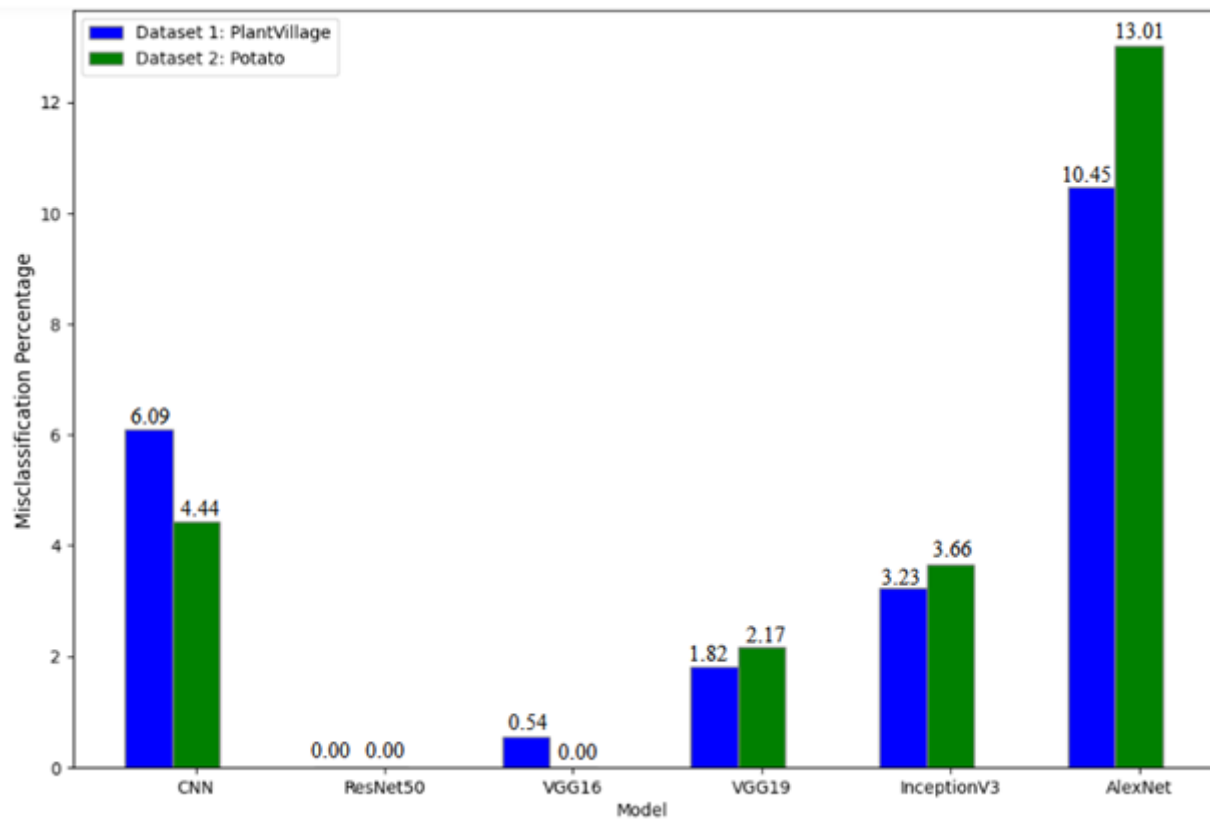




## COMPARISON BASED ON DATASETS (BASE MODELS)

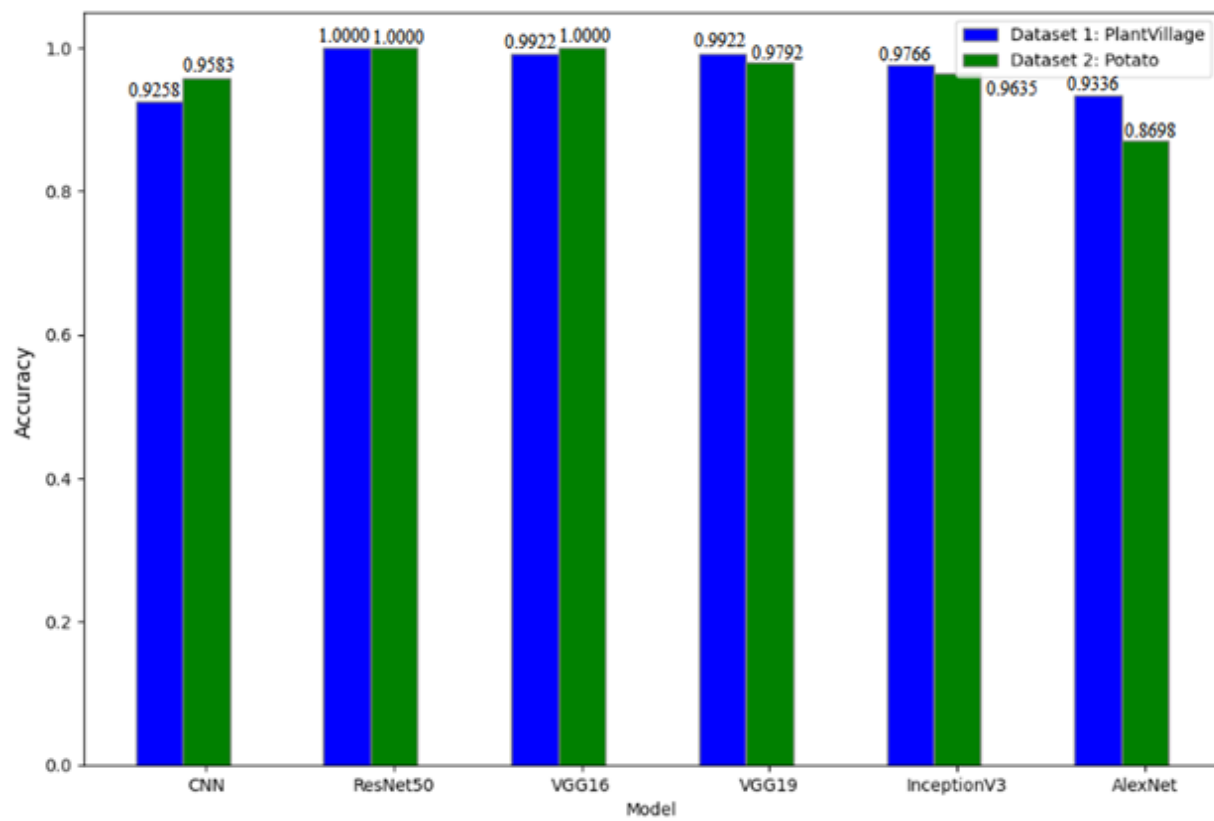
### *Misclassification Percentage*

<u>MODEL</u>	<u>Dataset 1</u>	<u>Dataset 2</u>
<b>CNN</b>	6.09%	4.44%
<b>ResNet50</b>	0.00%	0.00%
<b>VGG16</b>	0.54%	0.00%
<b>VGG19</b>	1.82%	2.17%
<b>InceptionV3</b>	3.23%	3.66%
<b>AlexNet</b>	10.45%	13.01%



### *Accuracy*

<u>MODEL</u>	<u>Dataset 1</u>	<u>Dataset 2</u>
CNN	0.9258	0.9583
ResNet50	1.0000	1.0000
VGG16	0.9922	1.0000
VGG19	0.9922	0.9792
InceptionV3	0.9766	0.9635
AlexNet	0.9336	0.8698



## *Loss*

<u>MODEL</u>	<u>Dataset 1</u>	<u>Dataset 2</u>
CNN	0.2212	0.1152
ResNet50	0.0046	0.0049
VGG16	0.1107	0.0016
VGG19	0.0926	0.4938
InceptionV3	1.5436	1.8479
AlexNet	0.2237	0.3773

