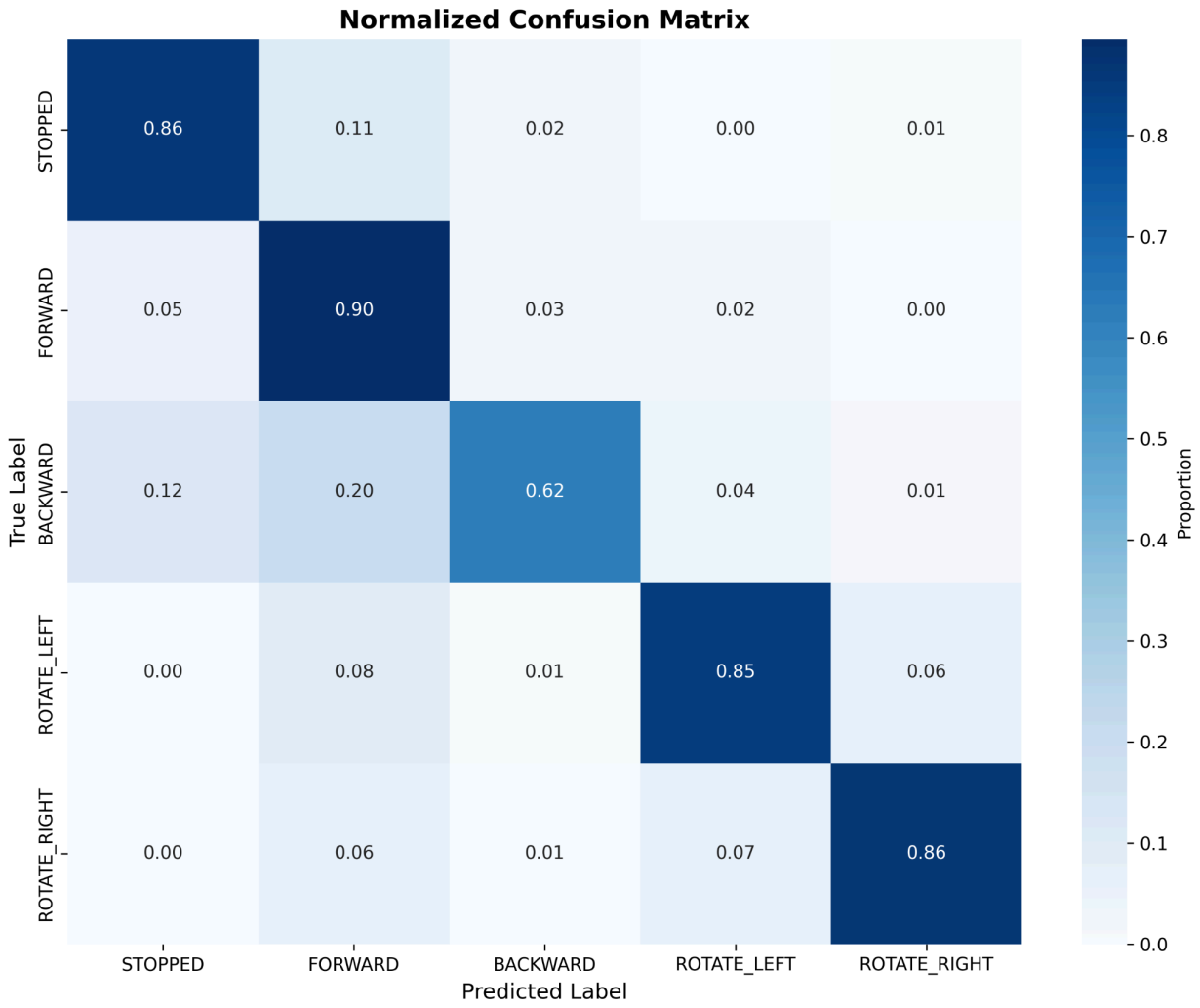
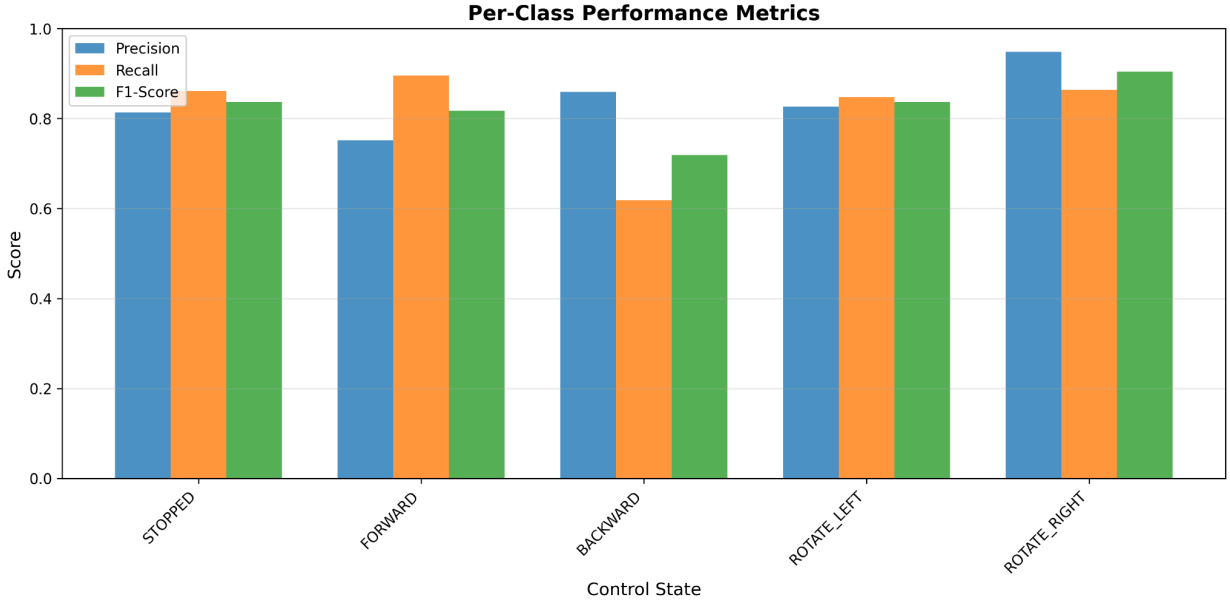
ResNet18 - 2F

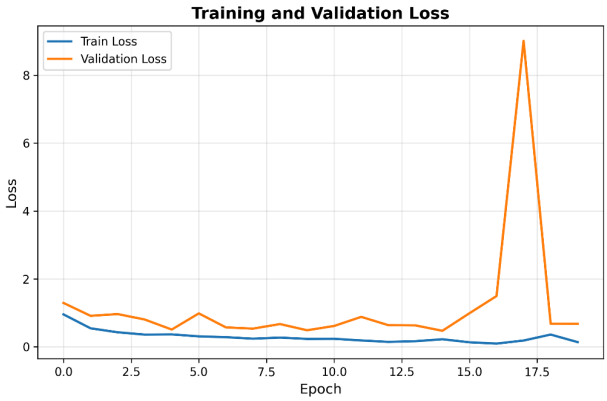
ResNet18 - 2F

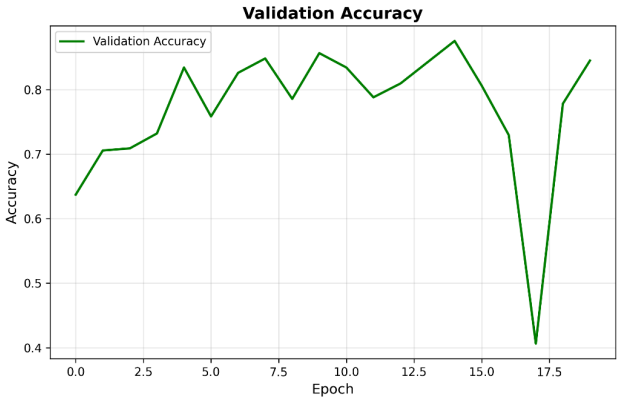
```
======================================================================
Test Metrics
======================================================================
Overall Accuracy: 0.8361
Macro Precision:  0.8397
Macro Recall:     0.8172
Macro F1-Score:   0.8227

Per-Class Metrics:
State          Precision    Recall       F1-Score     Support
----------------------------------------------------------------------
STOPPED        0.8131       0.8614       0.8365       101
FORWARD        0.7512       0.8953       0.8170       172
BACKWARD       0.8594       0.6180       0.7190       89
ROTATE_LEFT    0.8264       0.8475       0.8368       118
ROTATE_RIGHT   0.9483       0.8639       0.9041       191
======================================================================
```


Normalized Confusion Matrix
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
True Label
Predicted Label
Proportion
0.86 0.11 0.02 0.00 0.01
0.05 0.90 0.03 0.02 0.00
0.12 0.20 0.62 0.04 0.01
0.00 0.08 0.01 0.85 0.06
0.00 0.06 0.01 0.07 0.86
0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8


Per-Class Performance Metrics
Precision
Recall
F1-Score
Score
Control State
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
0.0 0.2 0.4 0.6 0.8 1.0


Training and Validation Loss
Train Loss
Validation Loss
Loss
Epoch
0
2
4
6
8
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5

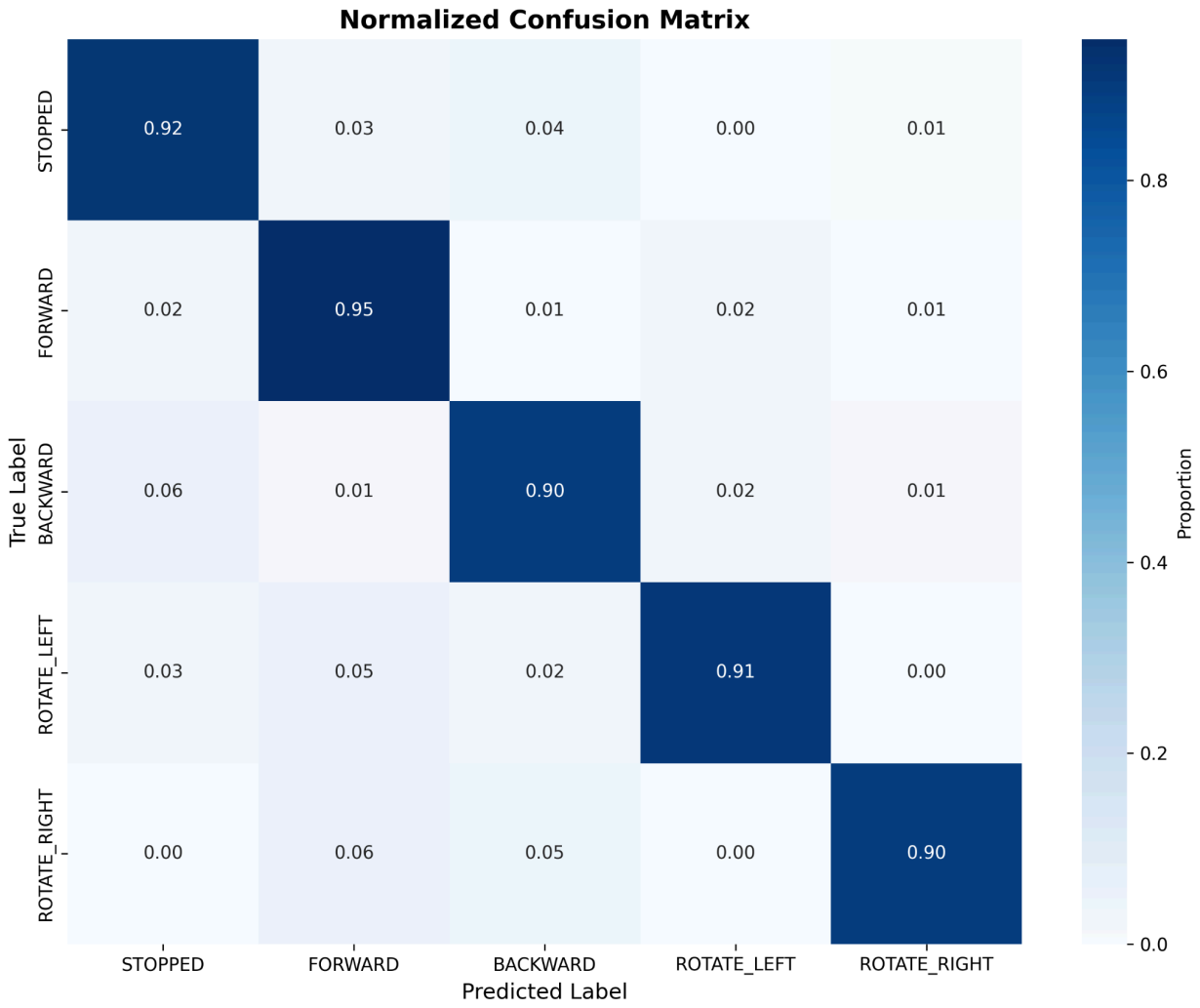

Validation Accuracy
Validation Accuracy
Accuracy
Epoch
0.4
0.5
0.6
0.7
0.8
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5

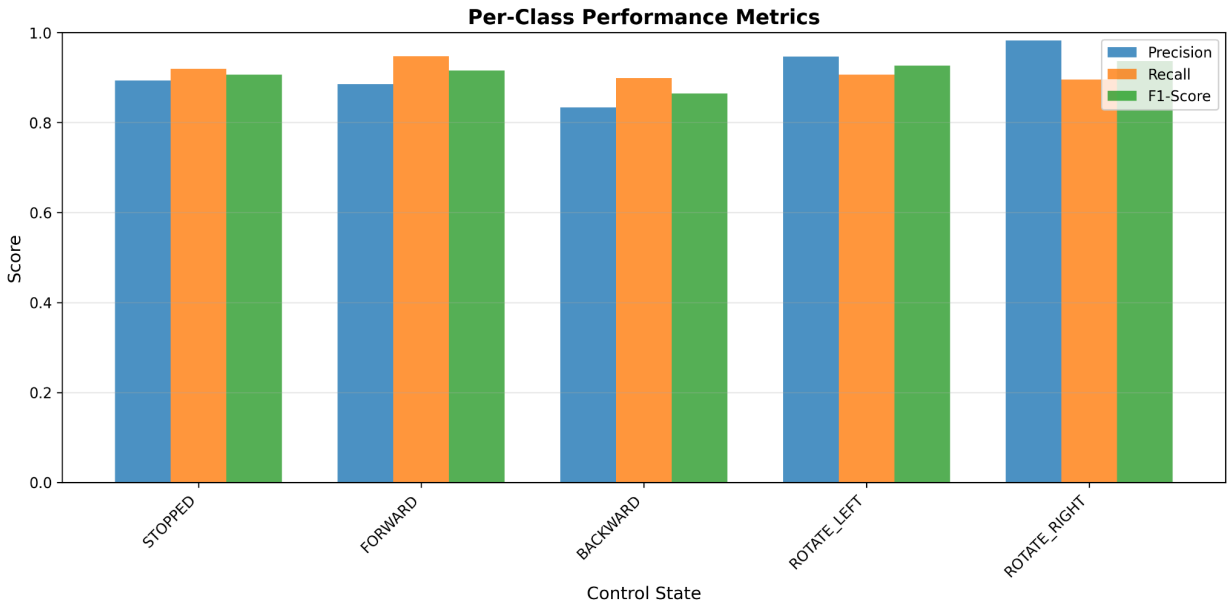
ResNet18 - 3F

ResNet18 - 3F

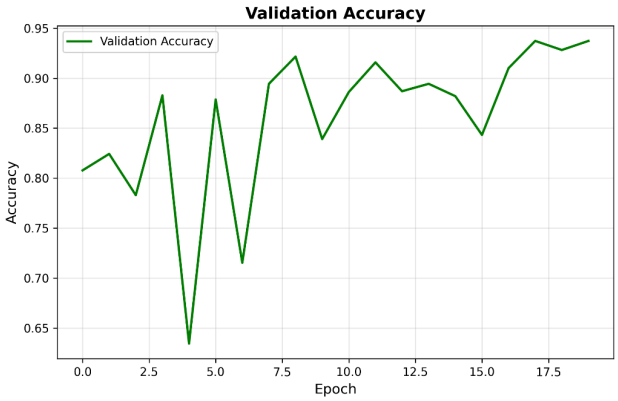
```
==========================================================================
Test Metrics
==========================================================================
Overall Accuracy: 0.9149
Macro Precision:  0.9084
Macro Recall:     0.9137
Macro F1-Score:   0.9101

Per-Class Metrics:
State          Precision    Recall       F1-Score     Support
--------------------------------------------------------------------------
STOPPED        0.8932       0.9200       0.9064       100
FORWARD        0.8859       0.9477       0.9157       172
BACKWARD       0.8333       0.8989       0.8649       89
ROTATE_LEFT    0.9469       0.9068       0.9264       118
ROTATE_RIGHT   0.9828       0.8953       0.9370       191
==========================================================================
```


Normalized Confusion Matrix
True Label
Predicted Label
Proportion
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
0.92 0.03 0.04 0.00 0.01
0.02 0.95 0.01 0.02 0.01
0.06 0.01 0.90 0.02 0.01
0.03 0.05 0.02 0.91 0.00
0.00 0.06 0.05 0.00 0.90
0.0
0.2
0.4
0.6
0.8


Per-Class Performance Metrics
Precision
Recall
F1-Score
Score
Control State
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
0.0
0.2
0.4
0.6
0.8
1.0

Training and Validation Loss
Train Loss
Validation Loss
Loss
Epoch
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5

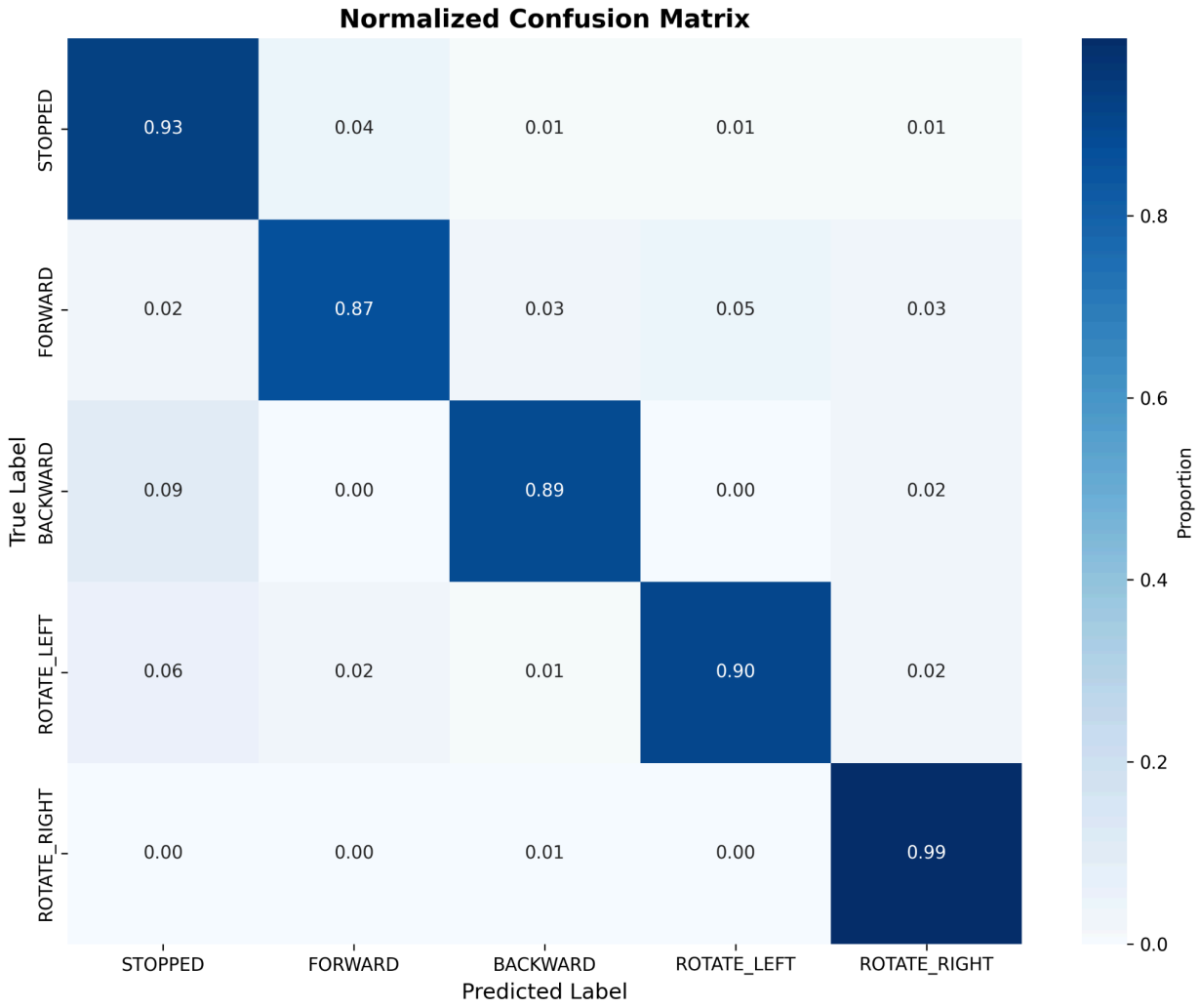

Validation Accuracy
Validation Accuracy
Accuracy
Epoch
0.65
0.70
0.75
0.80
0.85
0.90
0.95
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5

ResNet18 - 4f

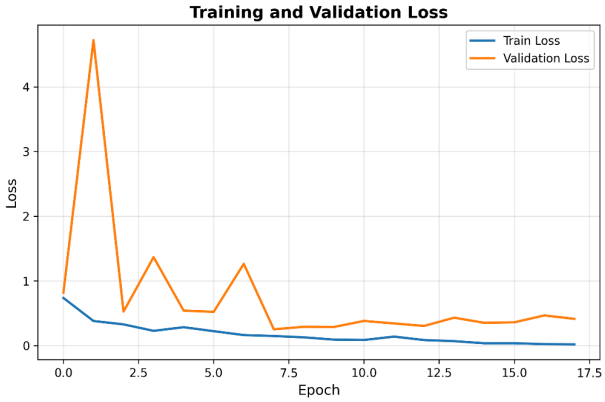
ResNet18 - 4f

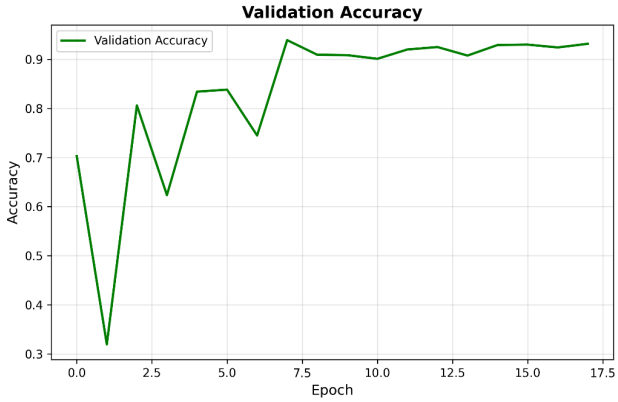
```
==========================================================================
Test Metrics
==========================================================================
Overall Accuracy: 0.9223
Macro Precision:  0.9146
Macro Recall:     0.9164
Macro F1-Score:   0.9144

Per-Class Metrics:
State          Precision    Recall       F1-Score     Support
--------------------------------------------------------------------------
STOPPED        0.8364       0.9293       0.8804       99
FORWARD        0.9615       0.8721       0.9146       172
BACKWARD       0.9080       0.8876       0.8977       89
ROTATE_LEFT    0.9217       0.8983       0.9099       118
ROTATE_RIGHT   0.9453       0.9948       0.9694       191
==========================================================================
```


Normalized Confusion Matrix
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
True Label
Predicted Label
0.93 0.04 0.01 0.01 0.01
0.02 0.87 0.03 0.05 0.03
0.09 0.00 0.89 0.00 0.02
0.06 0.02 0.01 0.90 0.02
0.00 0.00 0.01 0.00 0.99
Proportion
0.0
0.2
0.4
0.6
0.8

Per-Class Performance Metrics
Precision
Recall
F1-Score
Score
0.0
0.2
0.4
0.6
0.8
1.0
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
Control State


Training and Validation Loss
Train Loss
Validation Loss
Loss
Epoch
0
1
2
3
4
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5

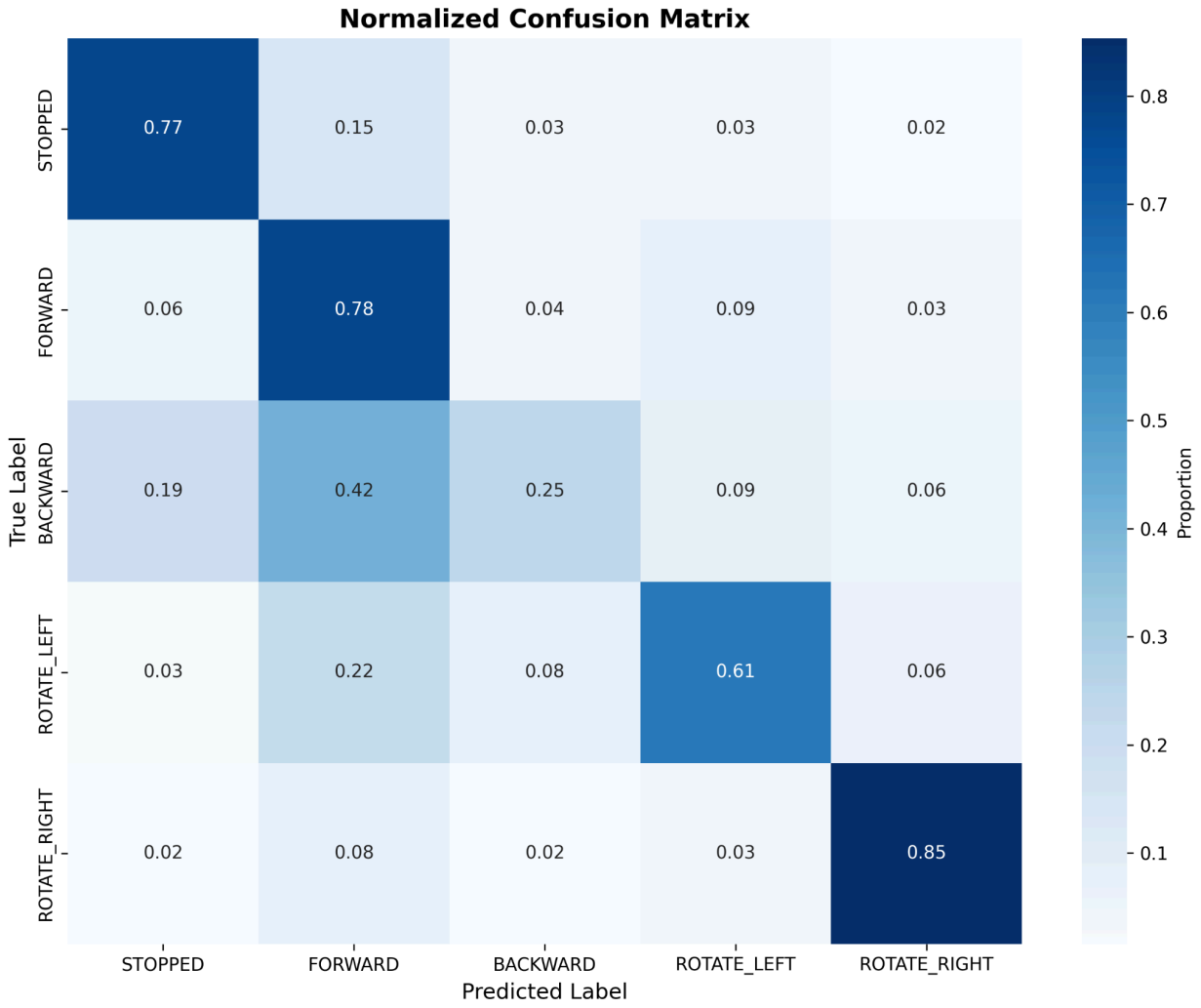

Validation Accuracy
Validation Accuracy
Accuracy
Epoch
0.3
0.4
0.5
0.6
0.7
0.8
0.9
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5

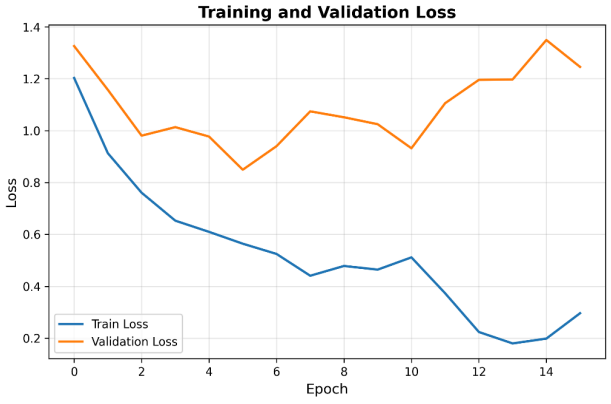
MobileNetV2 - 2F

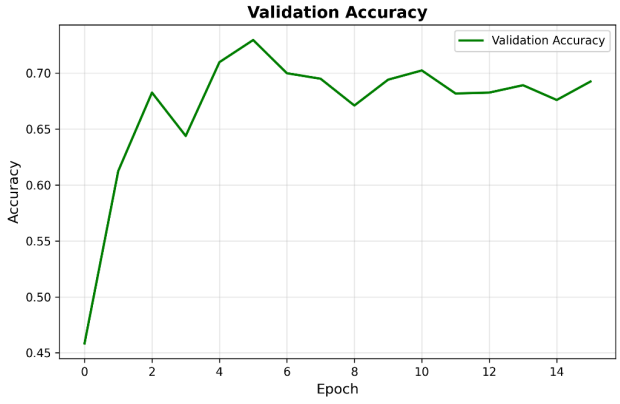
MobileNetV2 - 2F

```
======================================================================
Test Metrics
======================================================================
Overall Accuracy: 0.6990
Macro Precision:  0.6709
Macro Recall:     0.6524
Macro F1-Score:   0.6508

Per-Class Metrics:
State          Precision    Recall       F1-Score     Support
----------------------------------------------------------------------
STOPPED        0.7027       0.7723       0.7358       101
FORWARD        0.5903       0.7791       0.6717       172
BACKWARD       0.4783       0.2472       0.3259       89
ROTATE_LEFT    0.6923       0.6102       0.6486       118
ROTATE_RIGHT   0.8907       0.8534       0.8717       191
======================================================================
```


Normalized Confusion Matrix
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
True Label
0.77 0.15 0.03 0.03 0.02
0.06 0.78 0.04 0.09 0.03
0.19 0.42 0.25 0.09 0.06
0.03 0.22 0.08 0.61 0.06
0.02 0.08 0.02 0.03 0.85
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
Predicted Label
Proportion
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1


Training and Validation Loss
Loss
Epoch
Train Loss
Validation Loss
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0 2 4 6 8 10 12 14


Validation Accuracy
Accuracy
Epoch
Validation Accuracy
0.70
0.65
0.60
0.55
0.50
0.45
0 2 4 6 8 10 12 14

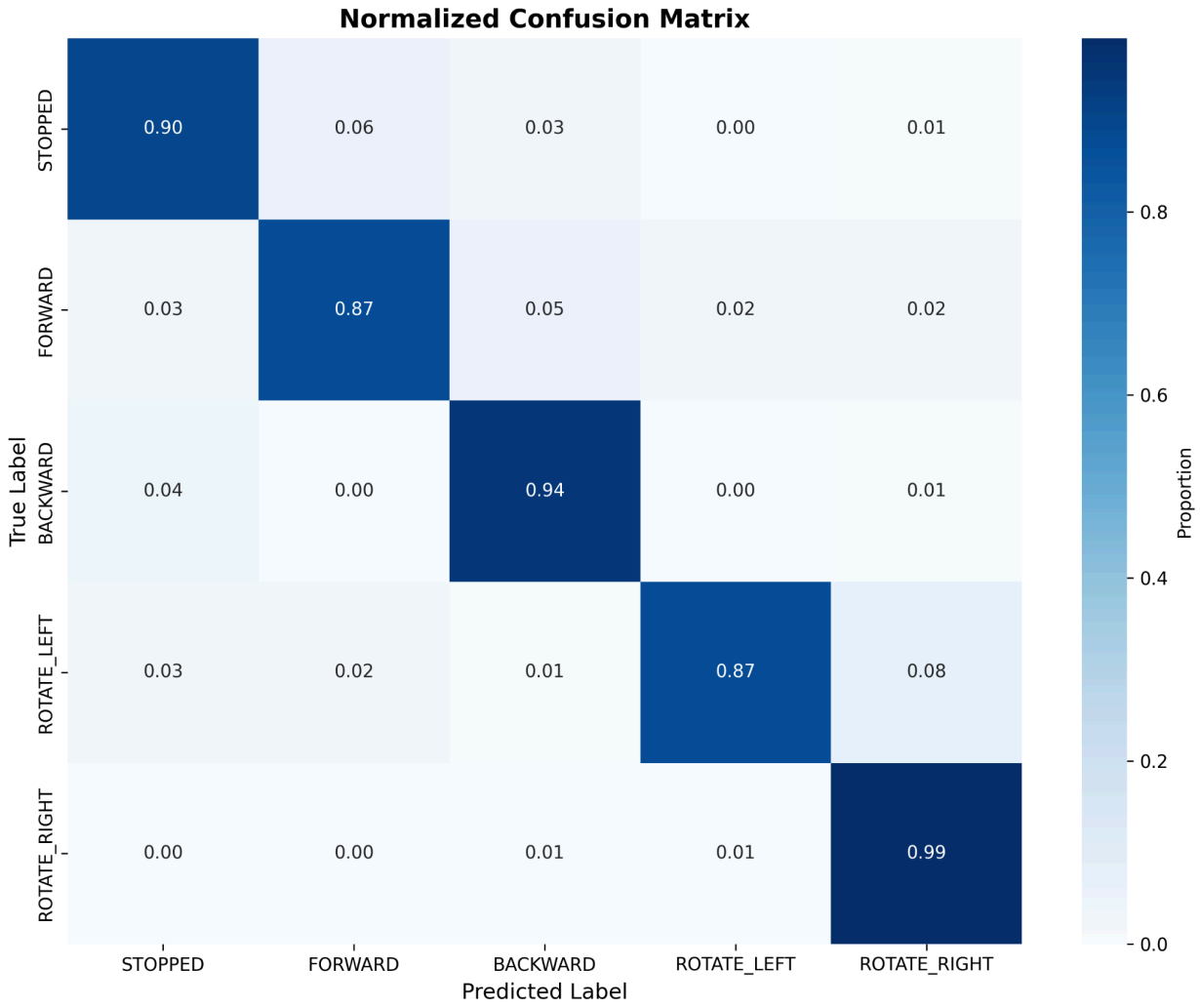
Per-Class Performance Metrics
Precision
Recall
F1-Score
Score
1.0
0.8
0.6
0.4
0.2
0.0
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
Control State

MobileNetV2 - 3F

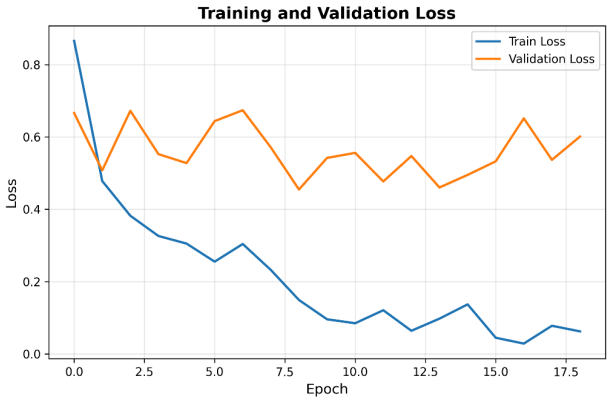
MobileNetV2 - 3F

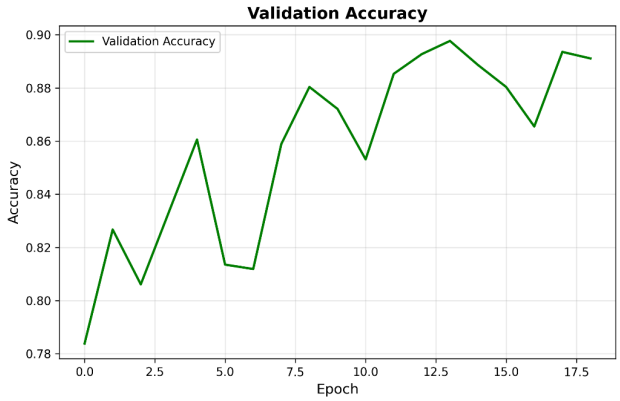
```
======================================================================
Test Metrics
======================================================================
Overall Accuracy: 0.9194
Macro Precision:  0.9130
Macro Recall:     0.9157
Macro F1-Score:   0.9130

Per-Class Metrics:
State          Precision    Recall       F1-Score     Support
----------------------------------------------------------------------
STOPPED        0.8738       0.9000       0.8867       100
FORWARD        0.9494       0.8721       0.9091       172
BACKWARD       0.8571       0.9438       0.8984       89
ROTATE_LEFT    0.9537       0.8729       0.9115       118
ROTATE_RIGHT   0.9310       0.9895       0.9594       191
======================================================================
```


Normalized Confusion Matrix
True Label
Predicted Label
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
0.90 0.06 0.03 0.00 0.01
0.03 0.87 0.05 0.02 0.02
0.04 0.00 0.94 0.00 0.01
0.03 0.02 0.01 0.87 0.08
0.00 0.00 0.01 0.01 0.99
Proportion
0.0
0.2
0.4
0.6
0.8

Per-Class Performance Metrics
Score
Control State
Precision
Recall
F1-Score
0.0
0.2
0.4
0.6
0.8
1.0
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT

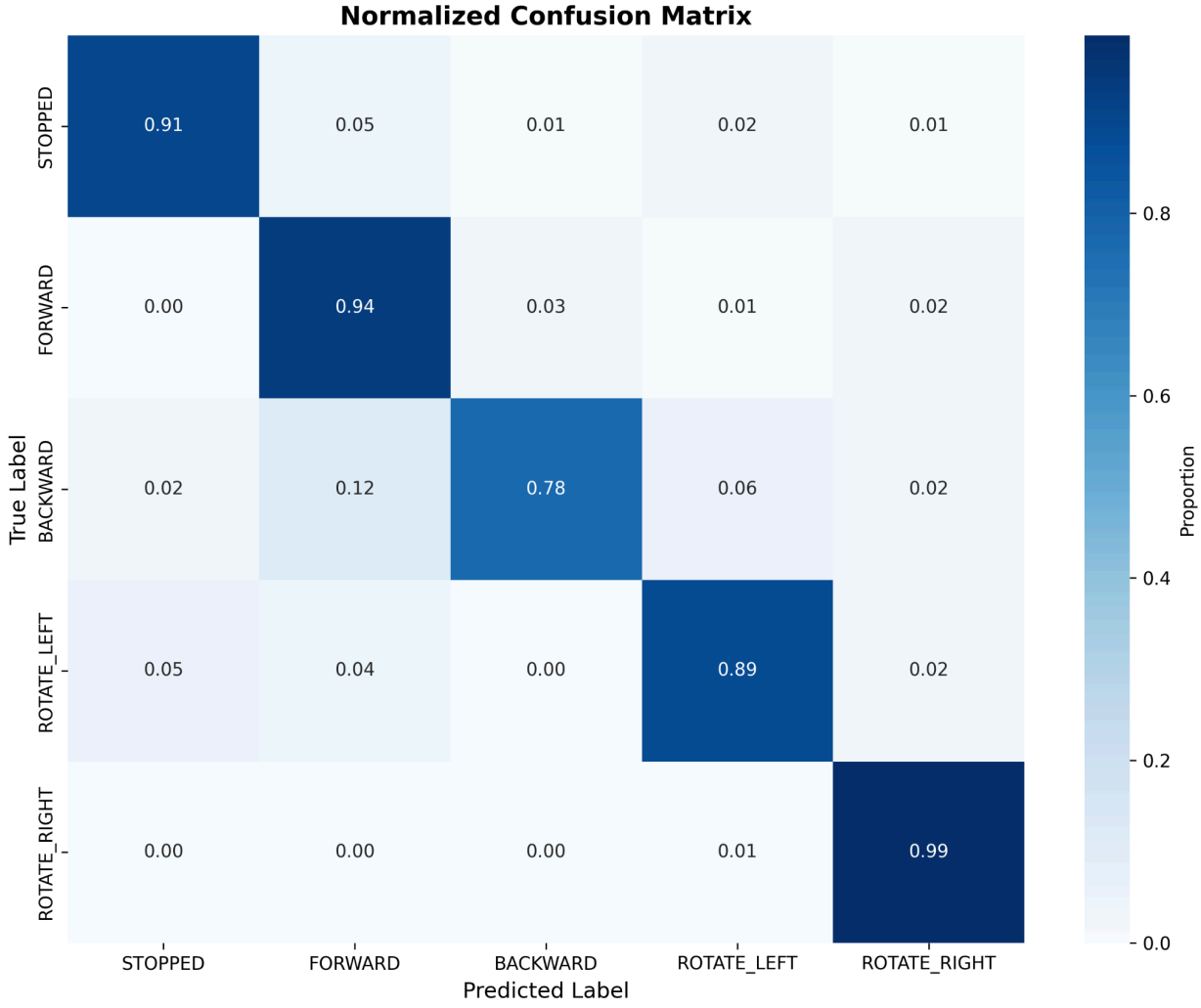

Training and Validation Loss
Train Loss
Validation Loss
Loss
Epoch
0.0
0.2
0.4
0.6
0.8
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5

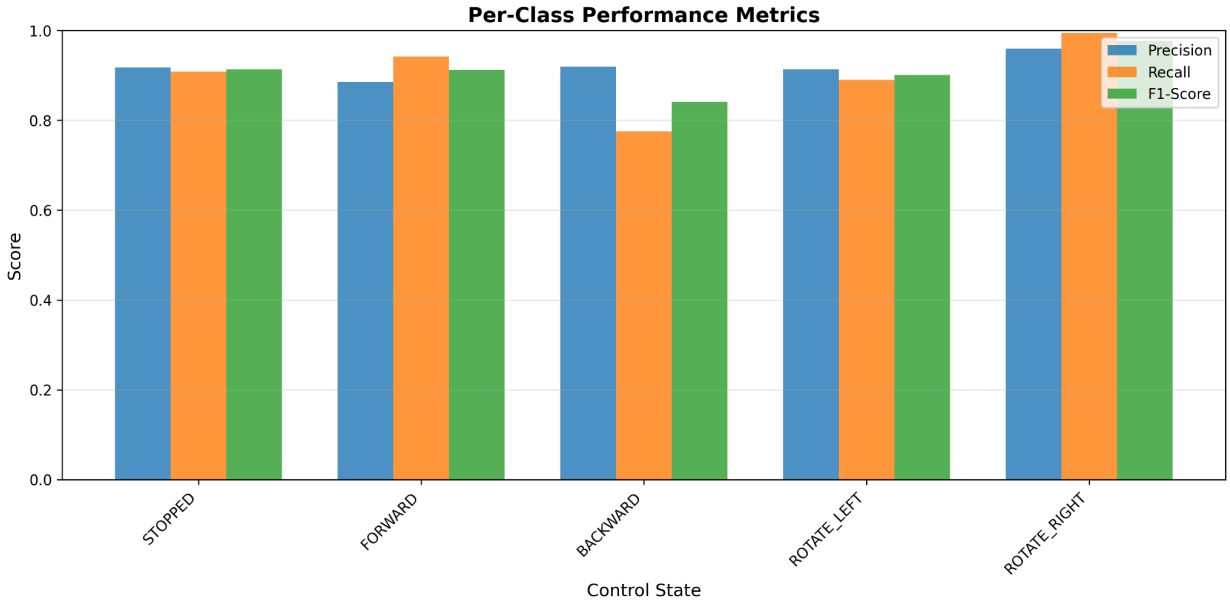

Validation Accuracy
Validation Accuracy
Accuracy
Epoch
0.78
0.80
0.82
0.84
0.86
0.88
0.90
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5

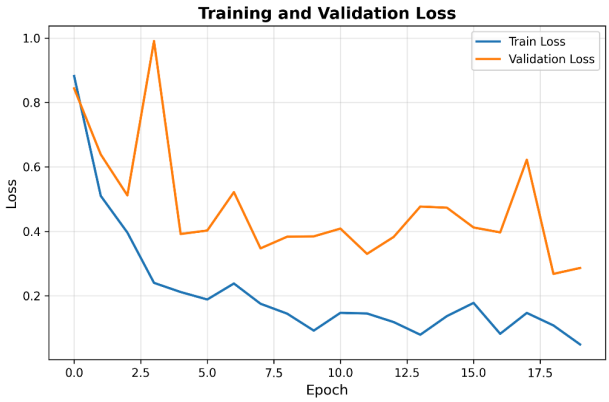
MobileNetV2 - 4F

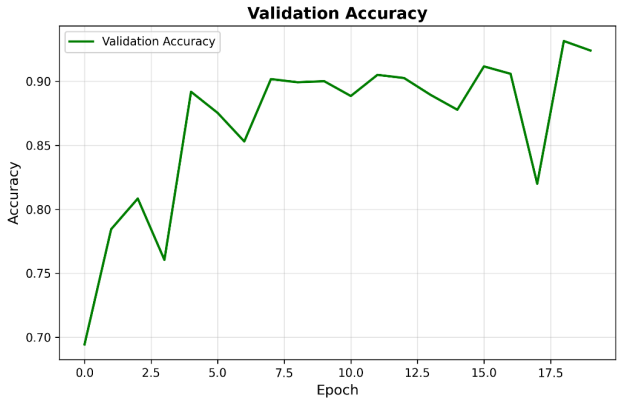
MobileNetV2 - 4F V2

==========
Test Metrics
==========
Overall Accuracy: 0.9208
Macro Precision: 0.9193
Macro Recall: 0.9022
Macro F1-Score: 0.9092




Per-Class Performance Metrics
Precision
Recall
F1-Score
Score
1.0
0.8
0.6
0.4
0.2
0.0
STOPPED
FORWARD
BACKWARD
ROTATE_LEFT
ROTATE_RIGHT
Control State


Training and Validation Loss
Train Loss
Validation Loss
Loss
1.0
0.8
0.6
0.4
0.2
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
Epoch


Validation Accuracy
Validation Accuracy
Accuracy
0.90
0.85
0.80
0.75
0.70
0.0
2.5
5.0
7.5
10.0
12.5
15.0
17.5
Epoch