2018-2019

```
ets>python tcn_cross_dataset-2018-2019.py
[INFO] Train set: (200000, 40), features: 40
[INFO] Test subset: 200000 samples
[INFO] Test set : (200000, 40)
[INFO] Using device: cpu
Epoch 01 | Train loss: 0.3503 | Train acc: 0.8901 | Test acc: 0.2209
Epoch 02 | Train loss: 0.2406 | Train acc: 0.9281 | Test acc: 0.2221
Epoch 03 | Train loss: 0.2329 | Train acc: 0.9296 | Test acc: 0.2210
Epoch 04 | Train loss: 0.2282 | Train acc: 0.9309 | Test acc: 0.2202
Epoch 05 | Train loss: 0.2281 | Train acc: 0.9300 | Test acc: 0.2249
Epoch 06 | Train loss: 0.2265 | Train acc: 0.9293 | Test acc: 0.2259
Epoch 07 | Train loss: 0.2213 | Train acc: 0.9321 | Test acc: 0.2266

===== Cross-dataset evaluation (TCN) =====
Train file: CICIDS2018-tcn.csv
Test  file: CICIDS2019-tcn.csv
Accuracy : 0.2266
Precision: 0.0567
Recall   : 0.2491
F1 score : 0.0924
```

2019

```
ets>python tcn_in_dataset-2019.py
[INFO] Train set: (200000, 40), features: 40
[INFO] Test set : (200000, 40)
[INFO] Using device: cpu
Epoch 01 | Train loss: 0.0921 | Train acc: 0.9751 | Test acc: 0.9919
Epoch 02 | Train loss: 0.0293 | Train acc: 0.9926 | Test acc: 0.9939
Epoch 03 | Train loss: 0.0253 | Train acc: 0.9935 | Test acc: 0.9924
Epoch 04 | Train loss: 0.0235 | Train acc: 0.9940 | Test acc: 0.9943
Epoch 05 | Train loss: 0.0221 | Train acc: 0.9941 | Test acc: 0.9947
Epoch 06 | Train loss: 0.0210 | Train acc: 0.9944 | Test acc: 0.9947
Epoch 07 | Train loss: 0.0199 | Train acc: 0.9946 | Test acc: 0.9950
Epoch 08 | Train loss: 0.0196 | Train acc: 0.9947 | Test acc: 0.9951

===== Cross-dataset evaluation (TCN) =====
Train file: CICIDS2019-tcn.csv
Test  file: CICIDS2019-tcn.csv
Accuracy : 0.9951
Precision: 0.6620
Recall   : 0.6640
F1 score : 0.6630
```

2019-2017

```
ets>python tcn_cross_dataset-2019-2017.py
[INFO] Train set: (200000, 40), features: 40
[INFO] Test set : (140339, 40)
[INFO] Using device: cpu
Epoch 01 | Train loss: 0.0986 | Train acc: 0.9742 | Test acc: 0.4788
Epoch 02 | Train loss: 0.0310 | Train acc: 0.9925 | Test acc: 0.4797
Epoch 03 | Train loss: 0.0253 | Train acc: 0.9936 | Test acc: 0.4841
Epoch 04 | Train loss: 0.0228 | Train acc: 0.9941 | Test acc: 0.4766
Epoch 05 | Train loss: 0.0216 | Train acc: 0.9943 | Test acc: 0.4946
Epoch 06 | Train loss: 0.0209 | Train acc: 0.9945 | Test acc: 0.4950
Epoch 07 | Train loss: 0.0202 | Train acc: 0.9946 | Test acc: 0.4948

===== Cross-dataset evaluation (TCN) =====
Train file: CICIDS2019-tcn.csv
Test  file: CICIDS2017-tcn.csv
Accuracy : 0.4948
Precision: 0.1889
Recall   : 0.2653
F1 score : 0.2207
```

```
Epoch 01 | Train loss: 0.0680 | Train acc: 0.9864 | Test acc: 0.8270
Epoch 02 | Train loss: 0.0063 | Train acc: 0.9983 | Test acc: 0.8236
Epoch 03 | Train loss: 0.0047 | Train acc: 0.9989 | Test acc: 0.8293
Epoch 04 | Train loss: 0.0040 | Train acc: 0.9992 | Test acc: 0.8128
Epoch 05 | Train loss: 0.0036 | Train acc: 0.9993 | Test acc: 0.8137
Epoch 06 | Train loss: 0.0033 | Train acc: 0.9993 | Test acc: 0.8135
Epoch 07 | Train loss: 0.0036 | Train acc: 0.9991 | Test acc: 0.8131

===== Cross-dataset evaluation (TCN) =====
Train file: CICIDS2017-tcn.csv
Test  file: CICIDS2018-tcn.csv
Accuracy : 0.8131
Precision: 0.1423
Recall   : 0.1593
F1 score : 0.1503
```

```
Epoch 01 | Train loss: 0.0837 | Train acc: 0.9746 | Test acc: 0.9991
Epoch 02 | Train loss: 0.0070 | Train acc: 0.9982 | Test acc: 0.9988
Epoch 03 | Train loss: 0.0051 | Train acc: 0.9989 | Test acc: 0.9992
Epoch 04 | Train loss: 0.0044 | Train acc: 0.9991 | Test acc: 0.9994
Epoch 05 | Train loss: 0.0045 | Train acc: 0.9990 | Test acc: 0.9996
Epoch 06 | Train loss: 0.0034 | Train acc: 0.9993 | Test acc: 0.9995
Epoch 07 | Train loss: 0.0033 | Train acc: 0.9993 | Test acc: 0.9994

===== Cross-dataset evaluation (TCN) =====
Train file: CICIDS2017-tcn.csv
Test  file: CICIDS2017-tcn.csv
Accuracy : 0.9994
Precision: 0.9994
Recall   : 0.9994
F1 score : 0.9994
```