Window size: 1024

Stride: 256

Only use channels LEFT\_TA, LEFT\_TS, RIGHT\_TA, RIGHT\_TS.

No scale on raw signal. Not shuffle and pick the last 20% data of each labels out for validation. Shuffle and split the rest to 80% for training and 20% for test.

Use discrete wavelet transform on raw data and resample approximation coefficients to make its size as same as details coefficients. Then get data with dimension [N,C,L,D].

N: number of the data

D: size of the output of discrete wavelet transform

L: length of details coefficients

C: number of channels

Feed the data to 1D CNN model.

No detrend:

Train (acc 1.000)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 277 | 0 | 0 |
| Actual 2 | 0 | 605 | 0 |
| Actual 6 | 0 | 0 | 392 |

Test (acc 0.987)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 67 | 1 | 0 |
| Actual 2 | 3 | 141 | 0 |
| Actual 6 | 0 | 0 | 107 |

Last 20% (acc 0.809)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 61 | 20 | 7 |
| Actual 2 | 15 | 174 | 6 |
| Actual 6 | 8 | 22 | 96 |

With detrend(lambda: 300):

Train (acc 1.000)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 277 | 0 | 0 |
| Actual 2 | 0 | 605 | 0 |
| Actual 6 | 0 | 0 | 392 |

Test (acc 0.990)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 66 | 2 | 0 |
| Actual 2 | 0 | 144 | 0 |
| Actual 6 | 1 | 0 | 106 |

Last 20% (acc 0.843)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 64 | 12 | 12 |
| Actual 2 | 21 | 168 | 6 |
| Actual 6 | 3 | 10 | 113 |

Parallel structure: feed raw data to the model, then the raw data will be directly processed by conv1d filter, signal rectification + conv1d, discrete wavelet transform + conv1d, fft + conv1d in parallel.

No detrend:

Train (acc 1.000)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 277 | 0 | 0 |
| Actual 2 | 0 | 605 | 0 |
| Actual 6 | 0 | 0 | 392 |

Test (acc 0.946)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 60 | 6 | 2 |
| Actual 2 | 4 | 138 | 2 |
| Actual 6 | 3 | 0 | 104 |

Last 20% (acc 0.804)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 55 | 19 | 14 |
| Actual 2 | 16 | 168 | 11 |
| Actual 6 | 8 | 12 | 106 |

With detrend(lambda: 300):

Train (acc 1.000)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 277 | 0 | 0 |
| Actual 2 | 0 | 605 | 0 |
| Actual 6 | 0 | 0 | 392 |

Test (acc 0.940)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 61 | 5 | 2 |
| Actual 2 | 7 | 136 | 1 |
| Actual 6 | 1 | 3 | 103 |

Last 20% (acc 0.767)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 44 | 20 | 24 |
| Actual 2 | 14 | 168 | 13 |
| Actual 6 | 11 | 13 | 102 |