Drop some files out for test. Shuffle and split the rest data as 75% for training and 25% for validation.

Class weights 1:5 for binary classification(0:others)

Feature: [IEMG,SSI,WL,ZC,ku,SSC,skew,Acti,AR,HIST,MDF,MNF,mDWT]

threshold\_ZC = 0.00

threshold\_SSC = 0.01

bins=3

bound = 3

HIST\_range = (-bound,bound)

Wavelet level = 3

Wavelet='db7'

Feature selection: VarianceThreshold(threshold=0.01)

Feature scale: MinMaxScaler((0,1))

## Drop Files[6,30,31,32,33,34,35]:

Class 0 : others

Train (acc 0.970)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 5409 | 153 |
| Actual others | 25 | 500 |

Valid (acc 0.944)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 1730 | 110 |
| Actual others | 3 | 187 |

Test (acc 0.924)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 288 | 38 |
| Actual others | 2 | 199 |

Class 1 : 2 : 6

Train (acc 0.869)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 93 | 12 | 17 |
| Actual 2 | 19 | 228 | 10 |
| Actual 6 | 8 | 4 | 144 |

Valid (acc 0.810)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 25 | 2 | 4 |
| Actual 2 | 14 | 81 | 3 |
| Actual 6 | 9 | 2 | 39 |

Test (acc 0.681)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 25 | 27 | 0 |
| Actual 2 | 4 | 53 | 0 |
| Actual 6 | 28 | 5 | 59 |

Class 2 : 6

Train (acc 0.957)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 246 | 13 |
| Actual 6 | 5 | 156 |

Valid (acc 0.914)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 86 | 10 |
| Actual 6 | 2 | 43 |

Test (acc 0.818)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 57 | 0 |
| Actual 6 | 27 | 65 |

Class 1 : 6

Train (acc 0.918)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 108 | 14 |
| Actual 6 | 8 | 139 |

Valid (acc 0.888)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 27 | 4 |
| Actual 6 | 6 | 53 |

Test (acc 0.854)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 50 | 2 |
| Actual 6 | 18 | 73 |

Class 1 : 2

Train (acc 0.902)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 102 | 19 |
| Actual 2 | 18 | 242 |

Valid (acc 0.881)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 27 | 5 |
| Actual 2 | 10 | 85 |

Test (acc 0.715)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 22 | 30 |
| Actual 2 | 1 | 56 |

## Drop Files[7,30,31,32,33,34,35]:

Class 0 : others

Train (acc 0.969)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 5432 | 167 |
| Actual others | 19 | 418 |

Valid (acc 0.966)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 1797 | 56 |
| Actual others | 12 | 147 |

Test (acc 0.986)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 269 | 7 |
| Actual others | 1 | 319 |

Class 1 : 2 : 6

Train (acc 0.883)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 32 | 22 | 10 |
| Actual 2 | 2 | 224 | 6 |
| Actual 6 | 5 | 7 | 139 |

Valid (acc 0.859)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 6 | 6 | 3 |
| Actual 2 | 6 | 85 | 4 |
| Actual 6 | 1 | 1 | 37 |

Test (acc 0.636)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 45 | 61 | 20 |
| Actual 2 | 13 | 69 | 3 |
| Actual 6 | 9 | 10 | 89 |

Class 2 : 6

Train (acc 0.966)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 237 | 7 |
| Actual 6 | 6 | 137 |

Valid (acc 0.938)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 80 | 3 |
| Actual 6 | 5 | 42 |

Test (acc 0.829)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 84 | 1 |
| Actual 6 | 32 | 76 |

Class 1 : 6

Train (acc 0.925)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 49 | 10 |
| Actual 6 | 5 | 137 |

Valid (acc 0.955)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 17 | 3 |
| Actual 6 | 0 | 48 |

Test (acc 0.722)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 62 | 64 |
| Actual 6 | 1 | 107 |

Class 1 : 2

Train (acc 0.884)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 28 | 30 |
| Actual 2 | 5 | 241 |

Valid (acc 0.892)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 12 | 9 |
| Actual 2 | 2 | 79 |

Test (acc 0.554)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 34 | 92 |
| Actual 2 | 2 | 83 |

## Drop Files[5,30,31,32,33,34,35]:

Class 0 : others

Train (acc 0.971)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 5429 | 142 |
| Actual others | 32 | 559 |

Valid (acc 0.936)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 1721 | 125 |
| Actual others | 5 | 204 |

Test (acc 0.936)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 288 | 23 |
| Actual others | 4 | 112 |

Class 1 : 2 : 6

Train (acc 0.861)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 107 | 22 | 17 |
| Actual 2 | 17 | 275 | 5 |
| Actual 6 | 15 | 7 | 134 |

Valid (acc 0.860)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 35 | 8 | 3 |
| Actual 2 | 10 | 94 | 2 |
| Actual 6 | 5 | 0 | 43 |

Test (acc 0.405)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 0 | 13 | 0 |
| Actual 2 | 0 | 9 | 0 |
| Actual 6 | 1 | 55 | 38 |

Class 2 : 6

Train (acc 0.962)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 284 | 8 |
| Actual 6 | 9 | 154 |

Valid (acc 0.947)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 106 | 5 |
| Actual 6 | 3 | 38 |

Test (acc 0.417)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 9 | 0 |
| Actual 6 | 60 | 34 |

Class 1 : 6

Train (acc 0.902)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 134 | 11 |
| Actual 6 | 18 | 134 |

Valid (acc 0.898)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 41 | 6 |
| Actual 6 | 4 | 48 |

Test (acc 0.813)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 11 | 2 |
| Actual 6 | 18 | 76 |

Class 1 : 2

Train (acc 0.908)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 133 | 19 |
| Actual 2 | 22 | 272 |

Valid (acc 0.865)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 30 | 10 |
| Actual 2 | 10 | 99 |

Test (acc 0.409)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 0 | 13 |
| Actual 2 | 0 | 9 |

## Model:

model = SVC(kernel="rbf",C=10,

class\_weight={0:1,1:5},

gamma='auto',

)