Drop some files out for test. No shuffle and split the rest data as 80% for training and 20% 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 0.977)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 5727 | 131 |
| Actual others | 15 | 547 |

Valid (acc 0.972)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 1509 | 35 |
| Actual others | 12 | 141 |

Test (acc 0.927)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 290 | 36 |
| Actual others | 2 | 199 |

Class 1 : 2 : 6

Train (acc 0.886)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 91 | 13 | 16 |
| Actual 2 | 15 | 252 | 11 |
| Actual 6 | 4 | 5 | 155 |

Valid (acc 0.815)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 14 | 7 | 12 |
| Actual 2 | 2 | 71 | 4 |
| Actual 6 | 1 | 2 | 39 |

Test (acc 0.686)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 14 | 37 | 1 |
| Actual 2 | 0 | 57 | 0 |
| Actual 6 | 9 | 16 | 67 |

Class 2 : 6

Train (acc 0.957)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 265 | 13 |
| Actual 6 | 6 | 158 |

Valid (acc 0.949)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 72 | 5 |
| Actual 6 | 1 | 41 |

Test (acc 0.825)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 57 | 0 |
| Actual 6 | 26 | 66 |

Class 1 : 6

Train (acc 0.943)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 107 | 13 |
| Actual 6 | 3 | 161 |

Valid (acc 0.786)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 22 | 11 |
| Actual 6 | 5 | 37 |

Test (acc 0.826)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 45 | 7 |
| Actual 6 | 18 | 74 |

Class 1 : 2

Train (acc 0.912)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 104 | 16 |
| Actual 2 | 19 | 259 |

Valid (acc 0.890)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 24 | 9 |
| Actual 2 | 3 | 74 |

Test (acc 0.688)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 18 | 34 |
| Actual 2 | 0 | 57 |

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

Class 0 : others

Train (acc 0.986)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 5746 | 152 |
| Actual others | 17 | 450 |

Valid (acc 0.968)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 1514 | 40 |
| Actual others | 13 | 116 |

Test (acc 0.973)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 270 | 6 |
| Actual others | 2 | 318 |

Class 1 : 2 : 6

Train (acc 0.888)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 33 | 21 | 7 |
| Actual 2 | 6 | 241 | 8 |
| Actual 6 | 6 | 4 | 141 |

Valid (acc 0.813)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 3 | 9 | 6 |
| Actual 2 | 2 | 67 | 3 |
| Actual 6 | 2 | 2 | 35 |

Test (acc 0.633)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 50 | 58 | 18 |
| Actual 2 | 14 | 69 | 2 |
| Actual 6 | 9 | 16 | 83 |

Class 2 : 6

Train (acc 0.965)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 247 | 8 |
| Actual 6 | 6 | 145 |

Valid (acc 0.945)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 68 | 4 |
| Actual 6 | 2 | 37 |

Test (acc 0.854)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 83 | 2 |
| Actual 6 | 26 | 82 |

Class 1 : 6

Train (acc 0.943)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 54 | 7 |
| Actual 6 | 5 | 146 |

Valid (acc 0.754)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 9 | 9 |
| Actual 6 | 5 | 34 |

Test (acc 0.645)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 43 | 83 |
| Actual 6 | 0 | 108 |

Class 1 : 2

Train (acc 0.898)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 39 | 22 |
| Actual 2 | 10 | 245 |

Valid (acc 0.844)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 8 | 10 |
| Actual 2 | 4 | 68 |

Test (acc 0.549)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 44 | 82 |
| Actual 2 | 13 | 72 |

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

Class 0 : others

Train (acc 0.975)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 5724 | 146 |
| Actual others | 15 | 614 |

Valid (acc 0.966)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 1501 | 46 |
| Actual others | 11 | 160 |

Test (acc 0.918)

|  |  |  |
| --- | --- | --- |
|  | Predicted 0 | Predicted others |
| Actual 0 | 291 | 20 |
| Actual others | 15 | 101 |

Class 1 : 2 : 6

Train (acc 0.864)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 112 | 24 | 15 |
| Actual 2 | 20 | 289 | 1 |
| Actual 6 | 15 | 4 | 143 |

Valid (acc 0.817)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 17 | 10 | 14 |
| Actual 2 | 4 | 82 | 1 |
| Actual 6 | 0 | 2 | 40 |

Test (acc 0.405)

|  |  |  |  |
| --- | --- | --- | --- |
|  | Predicted 1 | Predicted 2 | Predicted 6 |
| Actual 1 | 0 | 13 | 0 |
| Actual 2 | 0 | 9 | 0 |
| Actual 6 | 3 | 53 | 38 |

Class 2 : 6

Train (acc 0.960)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 305 | 11 |
| Actual 6 | 8 | 154 |

Valid (acc 0.945)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 82 | 5 |
| Actual 6 | 2 | 40 |

Test (acc 0.456)

|  |  |  |
| --- | --- | --- |
|  | Predicted 2 | Predicted 6 |
| Actual 2 | 9 | 0 |
| Actual 6 | 56 | 38 |

Class 1 : 6

Train (acc 0.916)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 140 | 11 |
| Actual 6 | 15 | 147 |

Valid (acc 0.746)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 22 | 19 |
| Actual 6 | 2 | 40 |

Test (acc 0.841)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 6 |
| Actual 1 | 10 | 3 |
| Actual 6 | 14 | 80 |

Class 1 : 2

Train (acc 0.905)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 127 | 24 |
| Actual 2 | 20 | 296 |

Valid (acc 0.835)

|  |  |  |
| --- | --- | --- |
|  | Predicted 1 | Predicted 2 |
| Actual 1 | 24 | 17 |
| Actual 2 | 4 | 83 |

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',

)