보행데이터 기반 파킨슨 질환 예측

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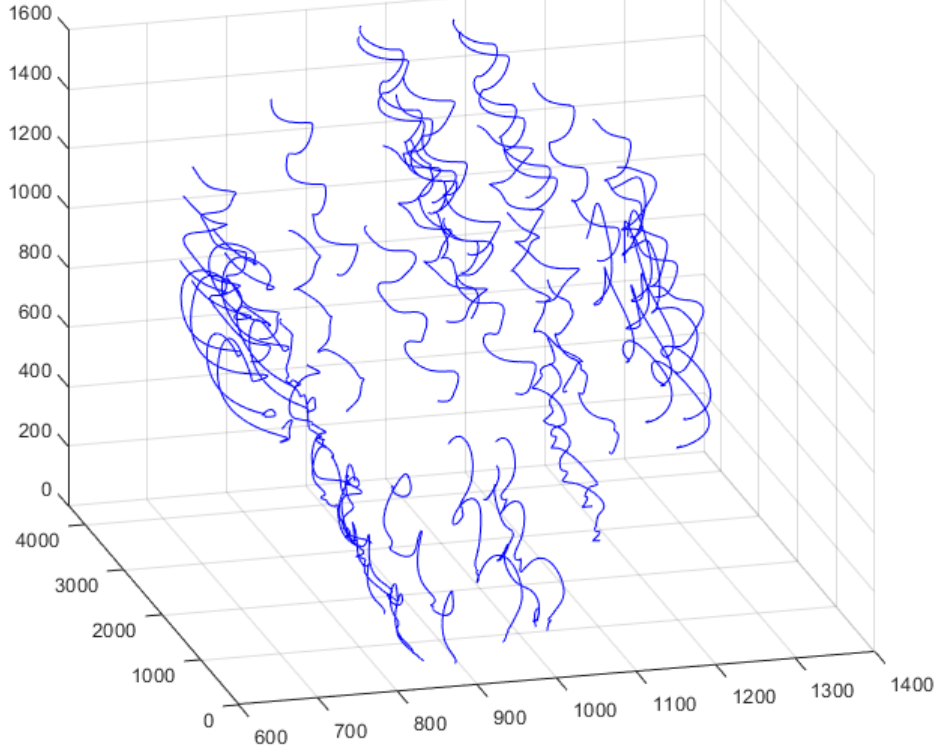
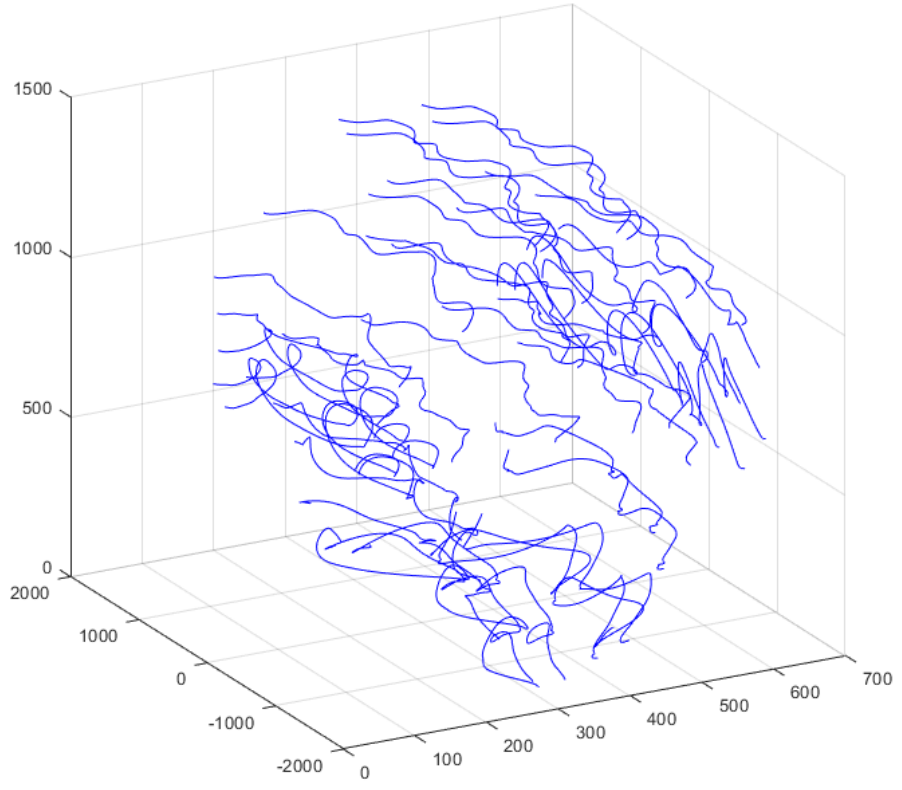
Data visualization



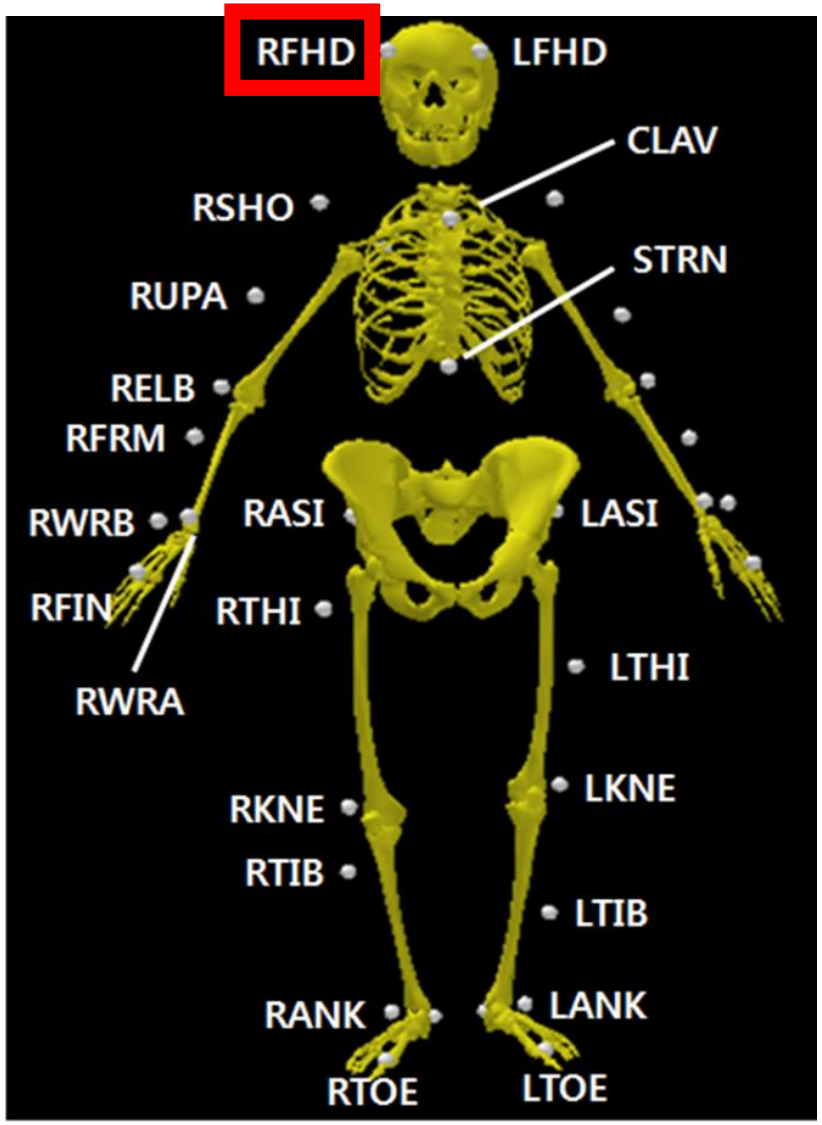
Control



PD

Data Preprocessing

- FW, BW 중 FW 데이터만 사용
- 위치, 속도, 가속도 중 위치 데이터만 사용
- PD, Control 마커의 개수가 다른 데이터 존재
  - 모든 데이터가 공통적으로 가지고 있는 마커만 사용
  - RFHD 제외됨
- 각 마커 데이터를 10번째 값부터 128개씩 사용
  - Input data 생성
- 각 마커별로 데이터 분리



Data

- **마커별로 데이터 분리**
  - $(128 \times 114) \rightarrow (128 \times 3) \times 38$
  - **Column Normalization**

각 마커당

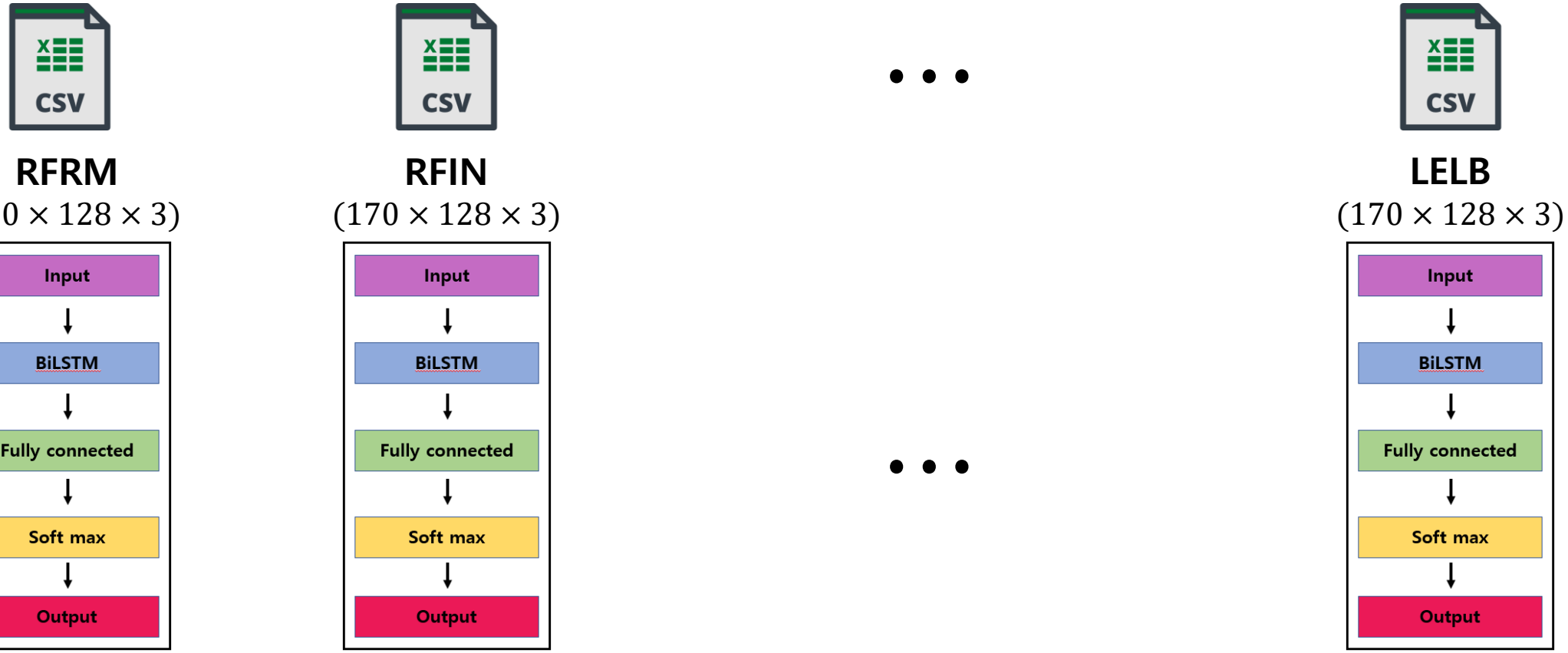
- **Training data : 170개**
- **Test data : 73개**

Method

1. 각 센서별로 LSTM based Classifier 훈련
2. 각 Classifier에 대해서 Train Score 측정
3. Train Score를 weight로 사용하여 Test data에 적용
4. Weight에 Threshold를 적용하여 최종 accuracy 계산

[Method]

1. 각 센서별로 LSTM Classifier 훈련

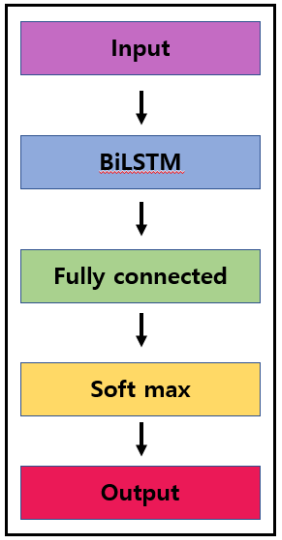


[Method]

2. 각 Classifier에 대해서 Train Score 측정

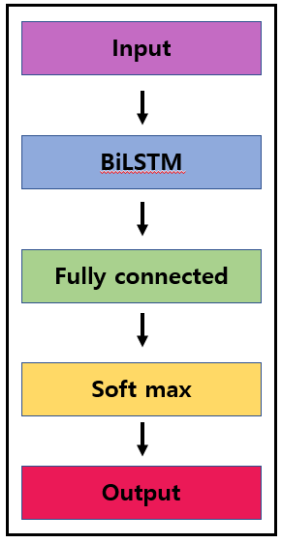
RFRM

$(170 \times 128 \times 3)$



RFIN

$(170 \times 128 \times 3)$



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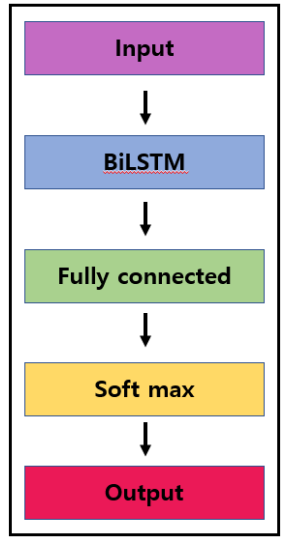
LELB

$(170 \times 128 \times 3)$



Train Score

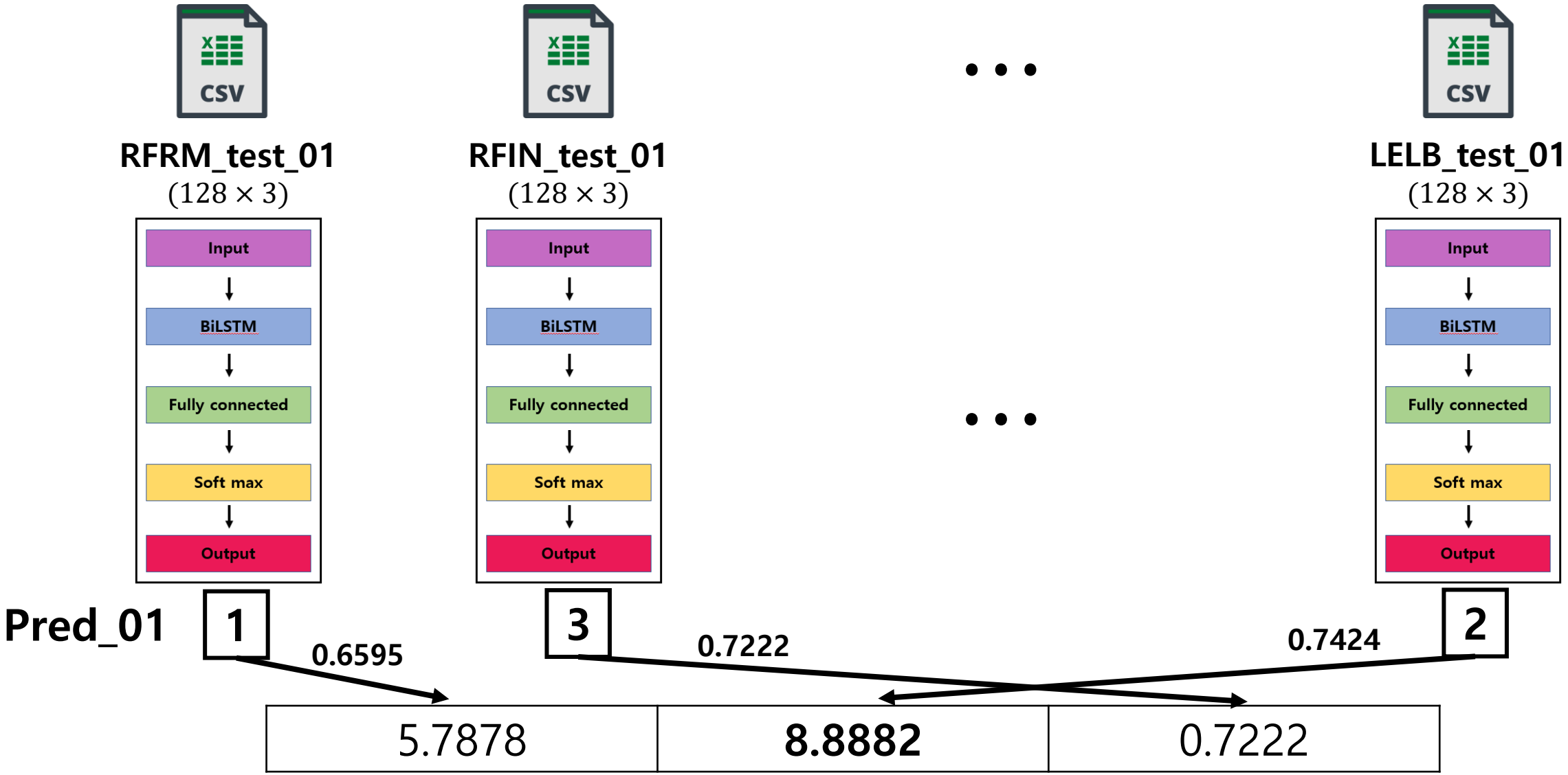
0.6595

0.7222

0.7424

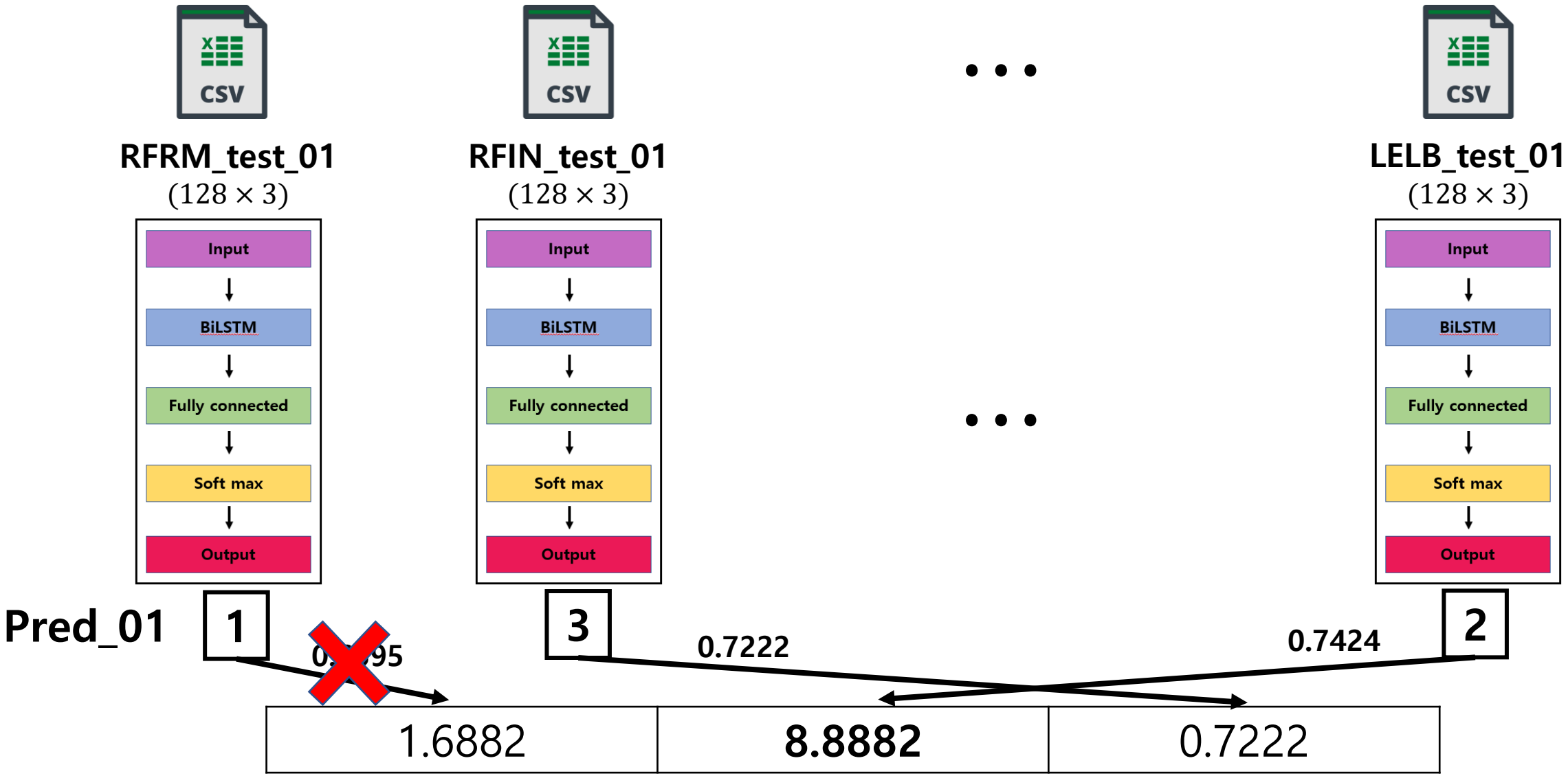
[Method]

3. Train Score를 weight로 사용하여 Test data에 적용

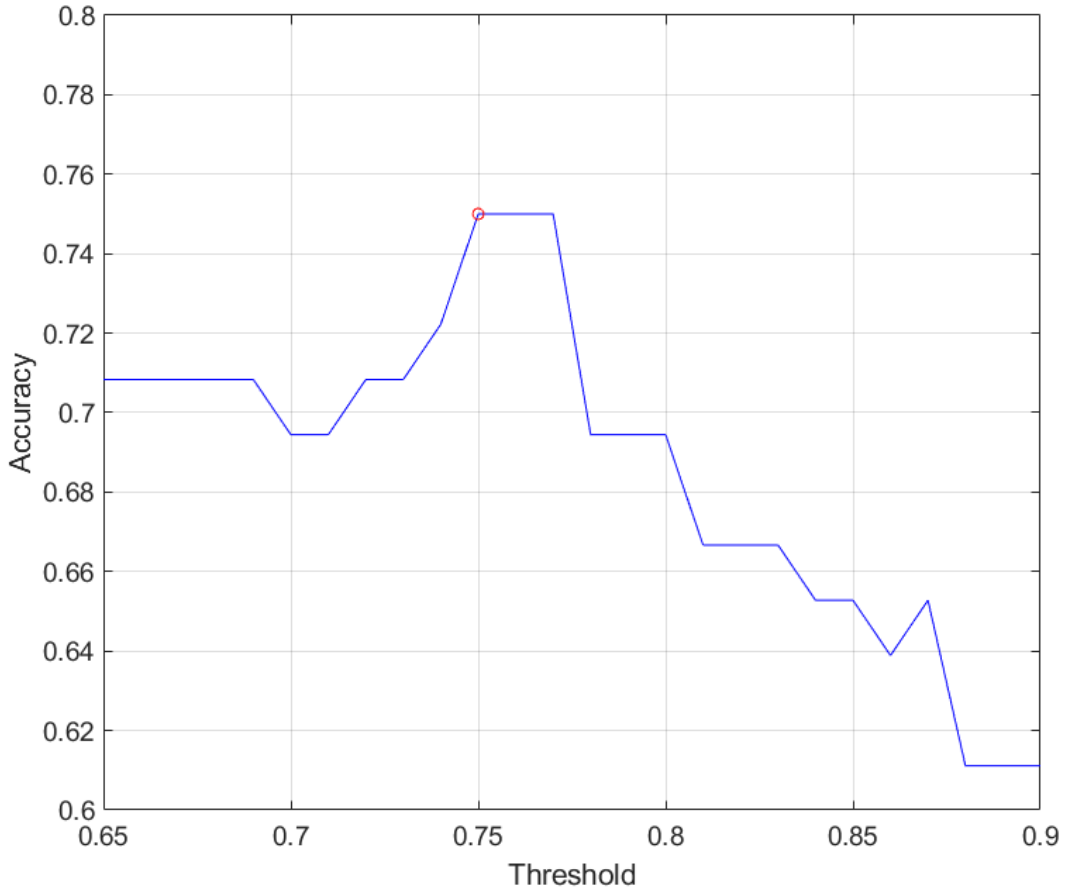


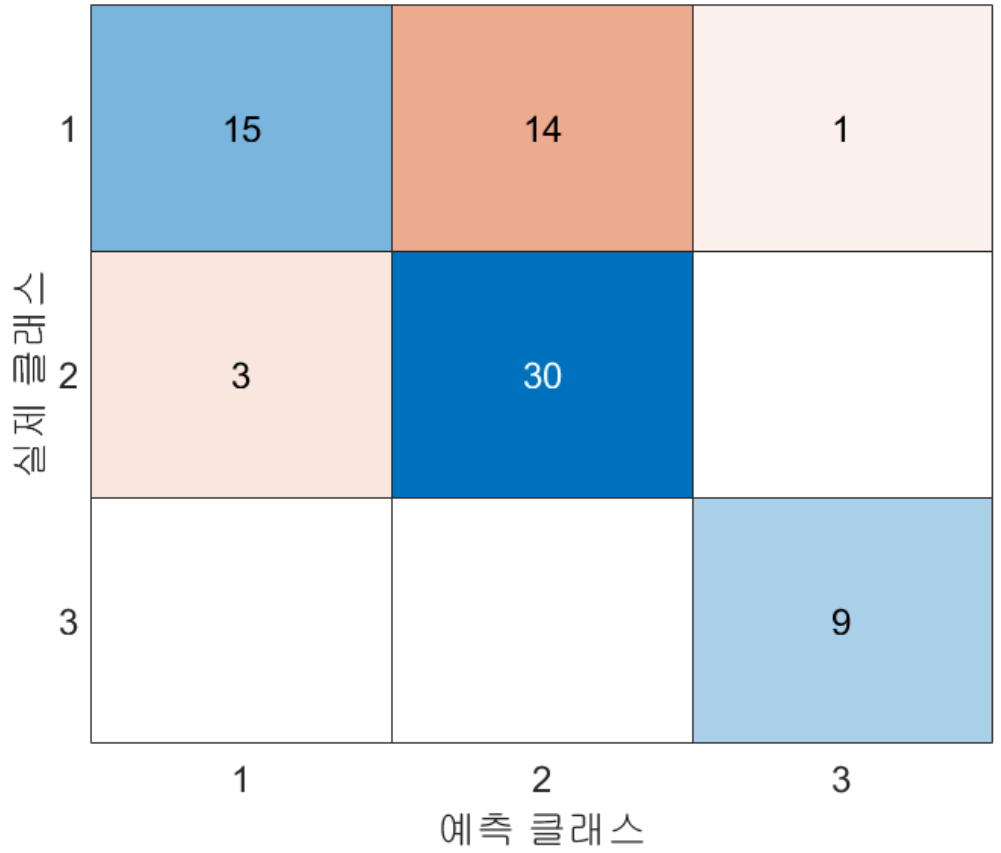
[Method]

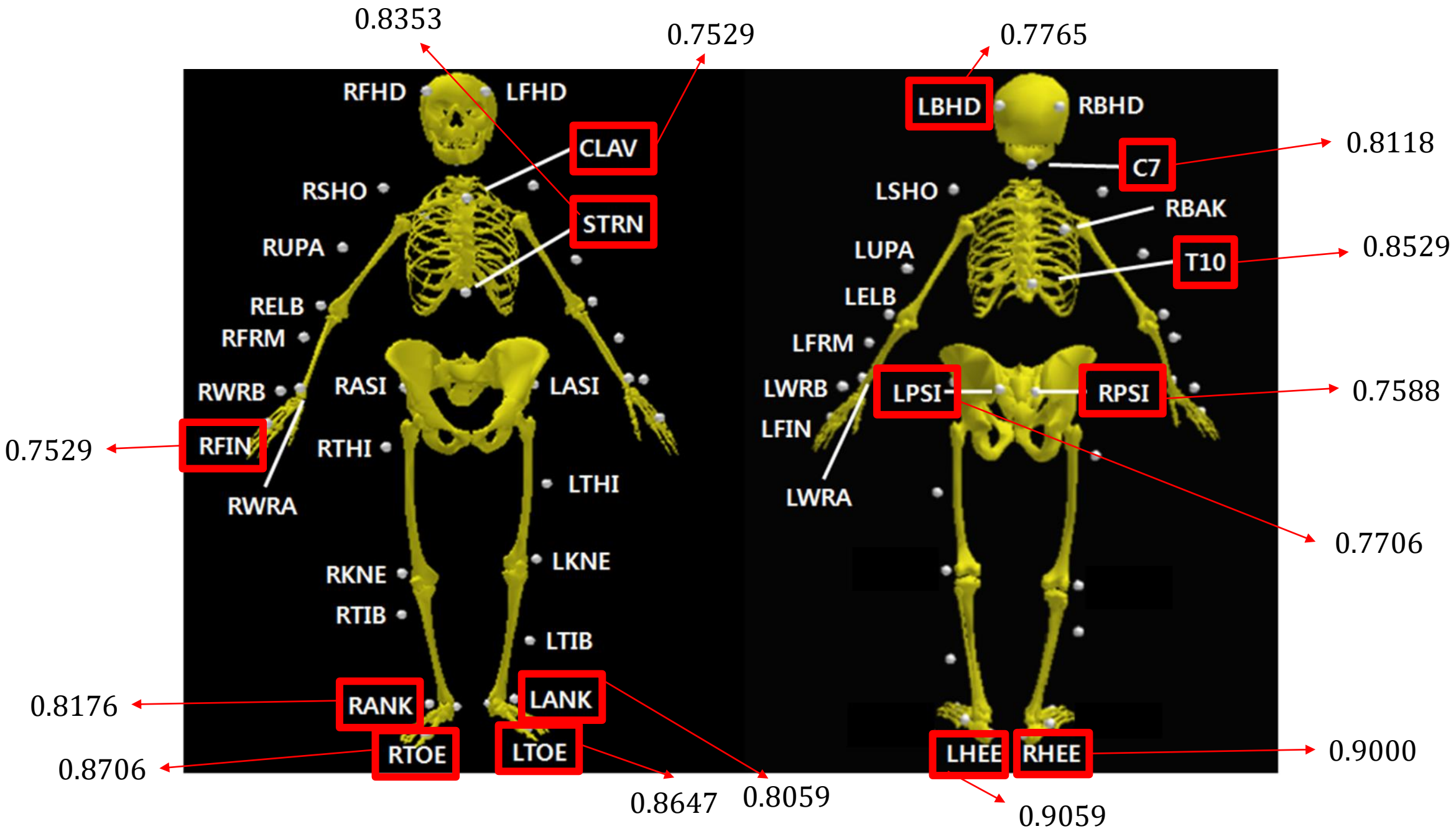
4. Weight에 Threshold를 적용하여 최종 accuracy 계산



Experiment result






0.8353
0.7529
0.7765
RFHD
LFHD
LBHD
RBHD
CLAV
C7
0.8118
RSHO
LSHO
STRN
RBAK
RUPA
LUPA
T10
0.8529
RELB
LELB
RFRM
LFRM
RWRB
RASI
LASI
LWRB
LPSI
RPSI
0.7588
0.7529
RFIN
RTHI
LFIN
RWRA
LTHI
LWRA
0.7706
RKNE
LKNE
RTIB
LTIB
0.8176
RANK
LANK
0.8706
RTOE
LTOE
LHEE
RHEE
0.9000
0.8647
0.8059
0.9059