

# 11 ml approaches for task to detect injury on running and walking dataset

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- Random Forest
- XGBoost
- SVM
- LSTM
- Temporal CNN (TCN)
- Transformer Encoder
- CNN-LSTM
- GRU
- TimesNet
- PatchTST
- Informer

## Upload dataset

```
pip install gdown
```

Upload [running.zip](#)

```
gdown 163iij4KxowSRwIFtdFZ-Uc2KkxoqRcv0
```

Upload [walking.zip](#)

```
gdown 1CD1Cb95Xuy5A3ZWUkuBM2cjf1o4F99zY'
```

## Train

Classic (CPU is OK)

This flag is for parallel boost by multicore (8 or  $8/2=4$  cores)

```
--loader_workers 8
```

```
# 1) Random Forest
python train.py --model rf --csv walk_data_meta_upd.csv --data_dir walking --
motion_key walking
# 2) SVM
python train.py --model svm --csv run_data_meta_upd.csv --data_dir walking --
motion_key walking --loader_workers 8
# 3) XGBoost
python train.py --model xgb --csv walk_data_meta_upd.csv --data_dir walking --
motion_key walking
```

Deep (GPU recommended; if CPU: start with `--max_len 1500 --batch_size 16 --epochs 10`):

```
# 4) LSTM
python train.py --model lstm --csv walk_data_meta_upd.csv --data_dir walking --
motion_key walking --max_len 1500 --batch_size 16 --epochs 10
# 5) TCN
python train.py --model tcn --csv walk_data_meta_upd.csv --data_dir walking --
motion_key walking --max_len 1500 --batch_size 16 --epochs 10
# 6) GRU
python train.py --model gru --csv walk_data_meta_upd.csv --data_dir walking --
motion_key walking --max_len 1500 --batch_size 16 --epochs 10
# 7) CNN-LSTM
python train.py --model cnn_lstm --csv walk_data_meta_upd.csv --data_dir
walking --motion_key walking --max_len 1500 --batch_size 16 --epochs 10
# 8) Transformer Encoder
python train.py --model transformer --csv walk_data_meta_upd.csv --data_dir
walking --motion_key walking --max_len 1500 --batch_size 16 --epochs 10
# 9) TimesNet (lite)
python train.py --model timesnet --csv walk_data_meta_upd.csv --data_dir
walking --motion_key walking --max_len 1500 --batch_size 16 --epochs 10
# 10) PatchTST (lite)
python train.py --model patchtst --csv walk_data_meta_upd.csv --data_dir
walking --motion_key walking --max_len 1500 --batch_size 16 --epochs 10
```

```
# 10) Informer (lite)
```

```
python train.py --model informer --csv walk_data_meta_upd.csv --data_dir
walking --motion_key walking --max_len 1500 --batch_size 16 --epochs 10
```

## Predict (using the trained model)

```
python predict.py --model_dir outputs/rf --motion_key walking --input_dir  
walk_my_test --out_csv preds_rf.csv
```

Or using the ready-trained models

```
python predict.py --model_dir models/classic_walk/rf --motion_key walking --  
input_dir walk_my_test --out_csv preds_rf.csv
```