C:\Users\whitn\Anaconda2\envs\ml4qs2\python.exe C:/Users/whitn/OneDrive/Documenten/Groupwork\_TommyErik/ML4QS/ML4QS-master/PythonCode/crowdsignals\_ch7\_classification\_gym\_WALKINGRUNNINGblockprediction.py

C:/Users/whitn/OneDrive/Documenten/Groupwork\_TommyErik/ML4QS/ML4QS-master/PythonCode/crowdsignals\_ch7\_classification\_gym\_WALKINGRUNNINGblockprediction.py:45: FutureWarning: to\_datetime is deprecated. Use pd.to\_datetime(...)

dataset.index = dataset.index.to\_datetime()

Training set length is: 89

Test set length is: 89

#basic features: 9

#PCA features: 4

#time features: 26

#frequency features: 189

#cluster features: 3

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[0.9662921348314607, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0]

['mag\_phone\_x\_freq\_1.51515151515\_Hz\_ws\_33', 'mag\_phone\_z\_temp\_mean\_ws\_100', 'mag\_phone\_y\_freq\_1.61616161616\_Hz\_ws\_33', 'mag\_phone\_y\_freq\_0.10101010101\_Hz\_ws\_33', 'gyr\_phone\_z\_freq\_0.909090909091\_Hz\_ws\_33', 'gyr\_phone\_z\_freq\_0.30303030303\_Hz\_ws\_33', 'acc\_phone\_z\_freq\_0.30303030303\_Hz\_ws\_33', 'acc\_phone\_z\_freq\_1.41414141414\_Hz\_ws\_33', 'mag\_phone\_z\_freq\_weighted', 'acc\_phone\_z\_freq\_0.808080808081\_Hz\_ws\_33', 'mag\_phone\_z\_pse', 'mag\_phone\_z\_freq\_1.71717172\_Hz\_ws\_33', 'mag\_phone\_y\_freq\_0.606060606061\_Hz\_ws\_33', 'gyr\_phone\_y\_freq\_0.0\_Hz\_ws\_33', 'acc\_phone\_z\_freq\_0.10101010101\_Hz\_ws\_33', 'mag\_phone\_x\_freq\_0.20202020202\_Hz\_ws\_33', 'acc\_phone\_x\_freq\_1.0101010101\_Hz\_ws\_33', 'gyr\_phone\_x\_freq\_1.41414141414\_Hz\_ws\_33', 'acc\_phone\_y\_freq\_1.61616161616\_Hz\_ws\_33', 'gyr\_phone\_y\_freq\_1.31313131313\_Hz\_ws\_33', 'mag\_phone\_y\_freq\_1.71717172\_Hz\_ws\_33', 'gyr\_phone\_y\_freq\_1.61616161616\_Hz\_ws\_33', 'mag\_phone\_x\_max\_freq', 'acc\_phone\_x\_max\_freq', 'gyr\_phone\_x', 'gyr\_phone\_x\_max\_freq', 'gyr\_phone\_y\_freq\_0.707070707071\_Hz\_ws\_33', 'acc\_phone\_z\_freq\_0.40404040404\_Hz\_ws\_33', 'gyr\_phone\_y\_freq\_0.909090909091\_Hz\_ws\_33', 'gyr\_phone\_y\_freq\_1.51515151515\_Hz\_ws\_33', 'mag\_phone\_x\_freq\_1.31313131313\_Hz\_ws\_33', 'gyr\_phone\_y\_freq\_1.41414141414\_Hz\_ws\_33', 'pca\_2\_temp\_mean\_ws\_100', 'gyr\_phone\_z\_freq\_1.41414141414\_Hz\_ws\_33', 'acc\_phone\_y\_freq\_0.808080808081\_Hz\_ws\_33', 'acc\_phone\_x\_freq\_0.20202020202\_Hz\_ws\_33', 'gyr\_phone\_y\_max\_freq', 'gyr\_phone\_z\_pse', 'acc\_phone\_y\_freq\_0.909090909091\_Hz\_ws\_33', 'acc\_phone\_z\_freq\_1.0101010101\_Hz\_ws\_33', 'mag\_phone\_x\_temp\_mean\_ws\_100', 'gyr\_phone\_x\_pse', 'gyr\_phone\_z\_freq\_0.707070707071\_Hz\_ws\_33', 'acc\_phone\_x\_freq\_1.71717172\_Hz\_ws\_33', 'mag\_phone\_z\_freq\_0.10101010101\_Hz\_ws\_33', 'gyr\_phone\_y\_freq\_0.808080808081\_Hz\_ws\_33', 'mag\_phone\_z\_freq\_0.20202020202\_Hz\_ws\_33', 'acc\_phone\_x\_temp\_mean\_ws\_100', 'mag\_phone\_y\_max\_freq', 'acc\_phone\_z\_freq\_0.20202020202\_Hz\_ws\_33']

These are the selected features **['mag\_phone\_x\_freq\_1.51515151515\_Hz\_ws\_33', 'mag\_phone\_z\_temp\_mean\_ws\_100', 'mag\_phone\_y\_freq\_1.61616161616\_Hz\_ws\_33', 'mag\_phone\_y\_freq\_0.10101010101\_Hz\_ws\_33', 'gyr\_phone\_z\_freq\_0.909090909091\_Hz\_ws\_33', 'gyr\_phone\_z\_freq\_0.30303030303\_Hz\_ws\_33', 'acc\_phone\_z\_freq\_0.30303030303\_Hz\_ws\_33', 'acc\_phone\_z\_freq\_1.41414141414\_Hz\_ws\_33', 'mag\_phone\_z\_freq\_weighted', 'acc\_phone\_z\_freq\_0.808080808081\_Hz\_ws\_33', 'mag\_phone\_z\_pse', 'mag\_phone\_z\_freq\_1.71717172\_Hz\_ws\_33', 'mag\_phone\_y\_freq\_0.606060606061\_Hz\_ws\_33', 'gyr\_phone\_y\_freq\_0.0\_Hz\_ws\_33', 'acc\_phone\_z\_freq\_0.10101010101\_Hz\_ws\_33', 'mag\_phone\_x\_freq\_0.20202020202\_Hz\_ws\_33', 'acc\_phone\_x\_freq\_1.0101010101\_Hz\_ws\_33', 'gyr\_phone\_x\_freq\_1.41414141414\_Hz\_ws\_33', 'acc\_phone\_y\_freq\_1.61616161616\_Hz\_ws\_33', 'gyr\_phone\_y\_freq\_1.31313131313\_Hz\_ws\_33']**

C:\Users\whitn\Anaconda2\envs\ml4qs2\lib\site-packages\sklearn\neural\_network\multilayer\_perceptron.py:563: ConvergenceWarning: Stochastic Optimizer: Maximum iterations reached and the optimization hasn't converged yet.

% (), ConvergenceWarning)

initial set & 0.9213 \emph{( 0.8643 - 0.9784 )} & 0.7483 \emph{( 0.6563 - 0.8403 )} & 0.9663 \emph{( 0.9280 - 1.0046 )} & 0.7865 \emph{( 0.6996 - 0.8734 )} & 0.9326 \emph{( 0.8794 - 0.9857 )} & 0.7865 \emph{( 0.6996 - 0.8734 )} & 0.8876 \emph{( 0.8207 - 0.9546 )} & 0.7416 \emph{( 0.6488 - 0.8344 )} & 0.8652 \emph{( 0.7928 - 0.9376 )} & 0.7079 \emph{( 0.6115 - 0.8043 )} & 0.8876 \emph{( 0.8207 - 0.9546 )} & 0.7640 \emph{( 0.6740 - 0.8541 )} \\\hline

Chapter 3 & 0.9640 \emph{( 0.9246 - 1.0035 )} & 0.7685 \emph{( 0.6791 - 0.8580 )} & 0.9236 \emph{( 0.8673 - 0.9799 )} & 0.7236 \emph{( 0.6288 - 0.8184 )} & 0.9326 \emph{( 0.8794 - 0.9857 )} & 0.7865 \emph{( 0.6996 - 0.8734 )} & 0.8876 \emph{( 0.8207 - 0.9546 )} & 0.7416 \emph{( 0.6488 - 0.8344 )} & 0.8652 \emph{( 0.7928 - 0.9376 )} & 0.7079 \emph{( 0.6115 - 0.8043 )} & 0.8652 \emph{( 0.7928 - 0.9376 )} & 0.7416 \emph{( 0.6488 - 0.8344 )} \\\hline

Chapter 4 & 0.9236 \emph{( 0.8673 - 0.9799 )} & 0.8067 \emph{( 0.7230 - 0.8905 )} & 0.9955 \emph{( 0.9813 - 1.0097 )} & 0.9730 \emph{( 0.9387 - 1.0074 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9213 \emph{( 0.8643 - 0.9784 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9326 \emph{( 0.8794 - 0.9857 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9213 \emph{( 0.8643 - 0.9784 )} & 0.9775 \emph{( 0.9461 - 1.0089 )} & 0.9438 \emph{( 0.8950 - 0.9926 )} \\\hline

Chapter 5 & 0.9933 \emph{( 0.9759 - 1.0106 )} & 0.8180 \emph{( 0.7362 - 0.8998 )} & 0.9933 \emph{( 0.9759 - 1.0106 )} & 0.9730 \emph{( 0.9387 - 1.0074 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9213 \emph{( 0.8643 - 0.9784 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9326 \emph{( 0.8794 - 0.9857 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9663 \emph{( 0.9280 - 1.0046 )} & 0.9775 \emph{( 0.9461 - 1.0089 )} & 0.9438 \emph{( 0.8950 - 0.9926 )} \\\hline

Selected features & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9124 \emph{( 0.8524 - 0.9723 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.8292 \emph{( 0.7494 - 0.9090 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.8989 \emph{( 0.8350 - 0.9628 )} & 0.9775 \emph{( 0.9461 - 1.0089 )} & 0.7978 \emph{( 0.7126 - 0.8829 )} & 0.9213 \emph{( 0.8643 - 0.9784 )} & 0.5843 \emph{( 0.4798 - 0.6888 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9101 \emph{( 0.8495 - 0.9707 )} \\\hline

{'criterion': 'entropy', 'min\_samples\_leaf': 2}

Feature importance decision tree:

mag\_phone\_z\_temp\_mean\_ws\_100 & 0.734005665843

mag\_phone\_y\_freq\_1.61616161616\_Hz\_ws\_33 & 0.265994334157

mag\_phone\_x\_freq\_1.51515151515\_Hz\_ws\_33 & 0.0

mag\_phone\_y\_freq\_0.10101010101\_Hz\_ws\_33 & 0.0

gyr\_phone\_z\_freq\_0.909090909091\_Hz\_ws\_33 & 0.0

gyr\_phone\_z\_freq\_0.30303030303\_Hz\_ws\_33 & 0.0

acc\_phone\_z\_freq\_0.30303030303\_Hz\_ws\_33 & 0.0

acc\_phone\_z\_freq\_1.41414141414\_Hz\_ws\_33 & 0.0

mag\_phone\_z\_freq\_weighted & 0.0

acc\_phone\_z\_freq\_0.808080808081\_Hz\_ws\_33 & 0.0

mag\_phone\_z\_pse & 0.0

mag\_phone\_z\_freq\_1.71717172\_Hz\_ws\_33 & 0.0

mag\_phone\_y\_freq\_0.606060606061\_Hz\_ws\_33 & 0.0

gyr\_phone\_y\_freq\_0.0\_Hz\_ws\_33 & 0.0

acc\_phone\_z\_freq\_0.10101010101\_Hz\_ws\_33 & 0.0

mag\_phone\_x\_freq\_0.20202020202\_Hz\_ws\_33 & 0.0

acc\_phone\_x\_freq\_1.0101010101\_Hz\_ws\_33 & 0.0

gyr\_phone\_x\_freq\_1.41414141414\_Hz\_ws\_33 & 0.0

acc\_phone\_y\_freq\_1.61616161616\_Hz\_ws\_33 & 0.0

gyr\_phone\_y\_freq\_1.31313131313\_Hz\_ws\_33 & 0.0

{'n\_estimators': 100, 'criterion': 'gini', 'min\_samples\_leaf': 2}

Feature importance random forest:

mag\_phone\_z\_temp\_mean\_ws\_100 & 0.307946058865

mag\_phone\_x\_freq\_1.51515151515\_Hz\_ws\_33 & 0.158668711801

mag\_phone\_y\_freq\_1.61616161616\_Hz\_ws\_33 & 0.115171931243

mag\_phone\_z\_freq\_1.71717172\_Hz\_ws\_33 & 0.0763257298543

gyr\_phone\_z\_freq\_0.909090909091\_Hz\_ws\_33 & 0.0682132375942

gyr\_phone\_y\_freq\_0.0\_Hz\_ws\_33 & 0.0426066345313

acc\_phone\_y\_freq\_1.61616161616\_Hz\_ws\_33 & 0.0283351236052

mag\_phone\_z\_pse & 0.0280063904002

acc\_phone\_z\_freq\_0.10101010101\_Hz\_ws\_33 & 0.0275998322832

gyr\_phone\_x\_freq\_1.41414141414\_Hz\_ws\_33 & 0.0203741783014

mag\_phone\_y\_freq\_0.606060606061\_Hz\_ws\_33 & 0.0197853716209

mag\_phone\_z\_freq\_weighted & 0.0191046967227

mag\_phone\_x\_freq\_0.20202020202\_Hz\_ws\_33 & 0.0176127840029

acc\_phone\_z\_freq\_1.41414141414\_Hz\_ws\_33 & 0.0151624938289

mag\_phone\_y\_freq\_0.10101010101\_Hz\_ws\_33 & 0.0110355244756

gyr\_phone\_z\_freq\_0.30303030303\_Hz\_ws\_33 & 0.0109027468228

acc\_phone\_z\_freq\_0.30303030303\_Hz\_ws\_33 & 0.00995529849561

acc\_phone\_x\_freq\_1.0101010101\_Hz\_ws\_33 & 0.0098995833092

acc\_phone\_z\_freq\_0.808080808081\_Hz\_ws\_33 & 0.00776563129186

gyr\_phone\_y\_freq\_1.31313131313\_Hz\_ws\_33 & 0.00552804095089

Process finished with exit code 0