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

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

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

Training set length is: 1285

Test set length is: 552

#basic features: 21

#PCA features: 7

#time features: 56

#frequency features: 432

#cluster features: 1

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[0.89416342412451366, 0.98287937743190656, 0.99688715953307394, 0.99844357976653697, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849, 0.99922178988326849]

['acc\_phone\_y\_freq\_0.0\_Hz\_ws\_40', 'press\_phone\_pressure\_temp\_mean\_ws\_120', 'gyr\_phone\_x\_temp\_std\_ws\_120', 'mag\_watch\_y\_pse', 'mag\_phone\_z\_max\_freq', 'gyr\_phone\_y\_freq\_1.0\_Hz\_ws\_40', 'mag\_watch\_z\_freq\_0.9\_Hz\_ws\_40', 'gyr\_watch\_y\_freq\_weighted', 'acc\_phone\_x\_freq\_1.9\_Hz\_ws\_40', 'acc\_watch\_y\_freq\_0.5\_Hz\_ws\_40', 'gyr\_phone\_y\_freq\_0.6\_Hz\_ws\_40', 'mag\_phone\_y\_freq\_1.5\_Hz\_ws\_40', 'gyr\_watch\_x\_freq\_1.6\_Hz\_ws\_40', 'gyr\_phone\_z\_freq\_0.5\_Hz\_ws\_40', 'acc\_phone\_y\_freq\_0.5\_Hz\_ws\_40', 'gyr\_watch\_z\_freq\_1.3\_Hz\_ws\_40', 'gyr\_watch\_z\_freq\_2.0\_Hz\_ws\_40', 'mag\_phone\_y\_freq\_0.2\_Hz\_ws\_40', 'mag\_phone\_y\_temp\_mean\_ws\_120', 'mag\_watch\_y\_freq\_1.8\_Hz\_ws\_40', 'mag\_watch\_x\_freq\_2.0\_Hz\_ws\_40', 'acc\_watch\_z\_freq\_1.0\_Hz\_ws\_40', 'gyr\_phone\_y\_pse', 'gyr\_watch\_y\_freq\_1.3\_Hz\_ws\_40', 'acc\_phone\_x\_freq\_1.3\_Hz\_ws\_40', 'mag\_watch\_y\_freq\_0.1\_Hz\_ws\_40', 'acc\_phone\_y\_freq\_0.1\_Hz\_ws\_40', 'gyr\_watch\_x\_freq\_0.6\_Hz\_ws\_40', 'mag\_phone\_z\_freq\_0.1\_Hz\_ws\_40', 'gyr\_phone\_y\_freq\_0.2\_Hz\_ws\_40', 'mag\_watch\_x\_freq\_0.5\_Hz\_ws\_40', 'mag\_watch\_x\_freq\_0.2\_Hz\_ws\_40', 'gyr\_phone\_x\_freq\_2.0\_Hz\_ws\_40', 'acc\_phone\_y\_freq\_0.6\_Hz\_ws\_40', 'acc\_phone\_x\_freq\_0.1\_Hz\_ws\_40', 'acc\_phone\_y\_max\_freq', 'mag\_phone\_x\_freq\_1.7\_Hz\_ws\_40', 'gyr\_watch\_z\_freq\_0.6\_Hz\_ws\_40', 'mag\_watch\_y\_freq\_1.9\_Hz\_ws\_40', 'gyr\_phone\_y\_freq\_1.2\_Hz\_ws\_40', 'gyr\_watch\_z\_freq\_0.8\_Hz\_ws\_40', 'mag\_phone\_x\_freq\_0.5\_Hz\_ws\_40', 'gyr\_phone\_z\_freq\_0.3\_Hz\_ws\_40', 'gyr\_watch\_x\_freq\_0.7\_Hz\_ws\_40', 'mag\_phone\_z\_freq\_0.5\_Hz\_ws\_40', 'mag\_watch\_y\_freq\_weighted', 'acc\_watch\_z\_freq\_0.8\_Hz\_ws\_40', 'gyr\_watch\_x', 'gyr\_watch\_z', 'mag\_watch\_z\_freq\_0.8\_Hz\_ws\_40']

[1.0, 1.0, 1.0, 1.0, 0.99953307392996105, 0.99431906614785992]

[0.97735507246376818, 0.97826086956521741, 0.97925724637681166, 0.98025362318840581, 0.98106884057971011, 0.98242753623188417]

initial set & 0.9863 \emph{( 0.9798 - 0.9928 )} & 0.9667 \emph{( 0.9514 - 0.9819 )} & 0.9997 \emph{( 0.9987 - 1.0007 )} & 0.9649 \emph{( 0.9492 - 0.9805 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9710 \emph{( 0.9567 - 0.9853 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9728 \emph{( 0.9590 - 0.9867 )} & 0.9914 \emph{( 0.9863 - 0.9966 )} & 0.9239 \emph{( 0.9013 - 0.9465 )} & 0.9300 \emph{( 0.9157 - 0.9442 )} & 0.9130 \emph{( 0.8891 - 0.9370 )} \\\hline

Chapter 3 & 0.9869 \emph{( 0.9806 - 0.9933 )} & 0.9696 \emph{( 0.9549 - 0.9842 )} & 0.9984 \emph{( 0.9962 - 1.0006 )} & 0.9645 \emph{( 0.9487 - 0.9802 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9710 \emph{( 0.9567 - 0.9853 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9728 \emph{( 0.9590 - 0.9867 )} & 0.9914 \emph{( 0.9863 - 0.9966 )} & 0.9330 \emph{( 0.9117 - 0.9543 )} & 0.9214 \emph{( 0.9064 - 0.9364 )} & 0.9094 \emph{( 0.8850 - 0.9339 )} \\\hline

Chapter 4 & 0.9978 \emph{( 0.9952 - 1.0004 )} & 0.9750 \emph{( 0.9617 - 0.9883 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9917 \emph{( 0.9839 - 0.9994 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9855 \emph{( 0.9753 - 0.9957 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9783 \emph{( 0.9658 - 0.9907 )} & 0.9946 \emph{( 0.9904 - 0.9987 )} & 0.9601 \emph{( 0.9435 - 0.9768 )} & 0.9479 \emph{( 0.9355 - 0.9603 )} & 0.9167 \emph{( 0.8931 - 0.9402 )} \\\hline

Chapter 5 & 0.9991 \emph{( 0.9974 - 1.0008 )} & 0.9772 \emph{( 0.9645 - 0.9899 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9931 \emph{( 0.9861 - 1.0002 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9855 \emph{( 0.9753 - 0.9957 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9783 \emph{( 0.9658 - 0.9907 )} & 0.9961 \emph{( 0.9926 - 0.9996 )} & 0.9674 \emph{( 0.9523 - 0.9825 )} & 0.9471 \emph{( 0.9346 - 0.9596 )} & 0.9167 \emph{( 0.8931 - 0.9402 )} \\\hline

Selected features & 0.8819 \emph{( 0.8639 - 0.8999 )} & 0.8457 \emph{( 0.8149 - 0.8764 )} & 0.9991 \emph{( 0.9974 - 1.0008 )} & 0.9779 \emph{( 0.9654 - 0.9904 )} & 0.9767 \emph{( 0.9682 - 0.9851 )} & 0.9511 \emph{( 0.9327 - 0.9694 )} & 0.8988 \emph{( 0.8820 - 0.9157 )} & 0.8696 \emph{( 0.8409 - 0.8982 )} & 0.9992 \emph{( 0.9977 - 1.0008 )} & 0.9801 \emph{( 0.9682 - 0.9920 )} & 0.8000 \emph{( 0.7777 - 0.8223 )} & 0.8062 \emph{( 0.7725 - 0.8398 )} \\\hline

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

Feature importance decision tree:

gyr\_phone\_x\_temp\_std\_ws\_120 & 0.34450175961

acc\_phone\_y\_freq\_0.0\_Hz\_ws\_40 & 0.33348490147

press\_phone\_pressure\_temp\_mean\_ws\_120 & 0.295323711838

mag\_watch\_y\_pse & 0.0192023209568

mag\_phone\_z\_max\_freq & 0.00433037624812

acc\_phone\_x\_freq\_1.9\_Hz\_ws\_40 & 0.00181385183982

gyr\_watch\_y\_freq\_weighted & 0.0013430780379

gyr\_phone\_y\_freq\_1.0\_Hz\_ws\_40 & 0.0

mag\_watch\_z\_freq\_0.9\_Hz\_ws\_40 & 0.0

acc\_watch\_y\_freq\_0.5\_Hz\_ws\_40 & 0.0

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

Feature importance random forest:

gyr\_phone\_x\_temp\_std\_ws\_120 & 0.27039256081

acc\_phone\_y\_freq\_0.0\_Hz\_ws\_40 & 0.264372085771

press\_phone\_pressure\_temp\_mean\_ws\_120 & 0.251049243036

mag\_watch\_y\_pse & 0.0835767754793

gyr\_phone\_y\_freq\_1.0\_Hz\_ws\_40 & 0.0262147725551

gyr\_watch\_y\_freq\_weighted & 0.0260139957873

acc\_phone\_x\_freq\_1.9\_Hz\_ws\_40 & 0.0258071732605

mag\_phone\_z\_max\_freq & 0.0257710779151

acc\_watch\_y\_freq\_0.5\_Hz\_ws\_40 & 0.0175688924223

mag\_watch\_z\_freq\_0.9\_Hz\_ws\_40 & 0.00923342296344

Process finished with exit code 0