C:\Users\whitn\Anaconda2\envs\ml4qs2\python.exe C:/Users/whitn/OneDrive/Documenten/Groupwork\_TommyErik/ML4QS/ML4QS-master/PythonCode/crowdsignals\_ch7\_classification\_question1practical.py

C:/Users/whitn/OneDrive/Documenten/Groupwork\_TommyErik/ML4QS/ML4QS-master/PythonCode/crowdsignals\_ch7\_classification\_question1practical.py:46: FutureWarning: to\_datetime is deprecated. Use pd.to\_datetime(...)

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

Training set length is: 2026

Test set length is: 869

#basic features: 21

#PCA features: 7

#time features: 56

#frequency features: 432

#cluster features: 1

selected\_features = ['acc\_phone\_y\_freq\_0.0\_Hz\_ws\_40', 'press\_phone\_pressure\_temp\_mean\_ws\_120', 'mag\_phone\_y\_temp\_mean\_ws\_120',  
 'acc\_watch\_y\_temp\_mean\_ws\_120', 'gyr\_watch\_x\_temp\_std\_ws\_120', 'mag\_phone\_z\_temp\_mean\_ws\_120', 'acc\_watch\_y\_pse',  
 'acc\_watch\_x\_freq\_1.2\_Hz\_ws\_40', 'gyr\_watch\_x\_freq\_1.9\_Hz\_ws\_40', 'acc\_watch\_y\_freq\_0.5\_Hz\_ws\_40']

initial set & 0.9477 \emph{( 0.9378 - 0.9576 )} & 0.9178 \emph{( 0.8992 - 0.9365 )} & 0.9941 \emph{( 0.9907 - 0.9975 )} & 0.9478 \emph{( 0.9327 - 0.9629 )} & 0.9812 \emph{( 0.9752 - 0.9873 )} & 0.9436 \emph{( 0.9280 - 0.9593 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9252 \emph{( 0.9074 - 0.9430 )} & 0.9274 \emph{( 0.9159 - 0.9390 )} & 0.8746 \emph{( 0.8521 - 0.8970 )} & 0.7399 \emph{( 0.7204 - 0.7594 )} & 0.7399 \emph{( 0.7102 - 0.7697 )} \\\hline

Chapter 3 & 0.9447 \emph{( 0.9346 - 0.9549 )} & 0.9119 \emph{( 0.8926 - 0.9311 )} & 0.9936 \emph{( 0.9900 - 0.9971 )} & 0.9464 \emph{( 0.9311 - 0.9617 )} & 0.9812 \emph{( 0.9752 - 0.9873 )} & 0.9436 \emph{( 0.9280 - 0.9593 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9252 \emph{( 0.9074 - 0.9430 )} & 0.9817 \emph{( 0.9758 - 0.9877 )} & 0.9010 \emph{( 0.8808 - 0.9213 )} & 0.8080 \emph{( 0.7905 - 0.8255 )} & 0.7940 \emph{( 0.7666 - 0.8215 )} \\\hline

Chapter 4 & 0.9794 \emph{( 0.9731 - 0.9857 )} & 0.9211 \emph{( 0.9028 - 0.9394 )} & 0.9994 \emph{( 0.9983 - 1.0005 )} & 0.9551 \emph{( 0.9411 - 0.9692 )} & 0.9995 \emph{( 0.9985 - 1.0005 )} & 0.5121 \emph{( 0.4782 - 0.5460 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9379 \emph{( 0.9215 - 0.9542 )} & 0.9916 \emph{( 0.9876 - 0.9957 )} & 0.9344 \emph{( 0.9176 - 0.9512 )} & 0.7572 \emph{( 0.7381 - 0.7762 )} & 0.7296 \emph{( 0.6994 - 0.7597 )} \\\hline

SVM test

Chapter 5 & 0.9862 \emph{( 0.9810 - 0.9914 )} & 0.9220 \emph{( 0.9038 - 0.9402 )} & 0.9995 \emph{( 0.9985 - 1.0005 )} & 0.9521 \emph{( 0.9376 - 0.9666 )} & 0.9995 \emph{( 0.9985 - 1.0005 )} & 0.5121 \emph{( 0.4782 - 0.5460 )} & 1.0000 \emph{( 1.0000 - 1.0000 )} & 0.9379 \emph{( 0.9215 - 0.9542 )} & 0.9877 \emph{( 0.9828 - 0.9926 )} & 0.9217 \emph{( 0.9035 - 0.9400 )} & 0.7581 \emph{( 0.7391 - 0.7772 )} & 0.7307 \emph{( 0.7006 - 0.7608 )} \\\hline

SVM test

Selected features & 0.8629 \emph{( 0.8476 - 0.8782 )} & 0.8221 \emph{( 0.7961 - 0.8480 )} & 0.9976 \emph{( 0.9955 - 0.9998 )} & 0.9577 \emph{( 0.9440 - 0.9713 )} & 0.9857 \emph{( 0.9804 - 0.9910 )} & 0.8987 \emph{( 0.8783 - 0.9192 )} & 0.9995 \emph{( 0.9985 - 1.0005 )} & 0.8907 \emph{( 0.8695 - 0.9118 )} & 0.9961 \emph{( 0.9933 - 0.9988 )} & 0.9310 \emph{( 0.9138 - 0.9482 )} & 0.6510 \emph{( 0.6299 - 0.6722 )} & 0.6318 \emph{( 0.5990 - 0.6645 )} [\\\hline](file:///\\\hline)

NB test

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

Feature importance decision tree:

press\_phone\_pressure\_temp\_mean\_ws\_120 & 0.356206033692

acc\_phone\_y\_freq\_0.0\_Hz\_ws\_40 & 0.346557040109

gyr\_watch\_x\_temp\_std\_ws\_120 & 0.0827746874772

acc\_watch\_y\_temp\_mean\_ws\_120 & 0.0775602100665

mag\_phone\_y\_temp\_mean\_ws\_120 & 0.0688842916998

mag\_phone\_z\_temp\_mean\_ws\_120 & 0.03721365755

acc\_watch\_y\_pse & 0.0168283736702

acc\_watch\_x\_freq\_1.2\_Hz\_ws\_40 & 0.00672391179594

gyr\_watch\_x\_freq\_1.9\_Hz\_ws\_40 & 0.00649208131289

acc\_watch\_y\_freq\_0.5\_Hz\_ws\_40 & 0.000759712626626

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

Feature importance random forest:

press\_phone\_pressure\_temp\_mean\_ws\_120 & 0.239540292964

acc\_phone\_y\_freq\_0.0\_Hz\_ws\_40 & 0.195270872805

acc\_watch\_y\_temp\_mean\_ws\_120 & 0.149130342288

mag\_phone\_y\_temp\_mean\_ws\_120 & 0.140621093788

gyr\_watch\_x\_temp\_std\_ws\_120 & 0.110721775309

mag\_phone\_z\_temp\_mean\_ws\_120 & 0.0924622108048

acc\_watch\_y\_pse & 0.047007609266

acc\_watch\_x\_freq\_1.2\_Hz\_ws\_40 & 0.00973227014674

gyr\_watch\_x\_freq\_1.9\_Hz\_ws\_40 & 0.00898450469113

acc\_watch\_y\_freq\_0.5\_Hz\_ws\_40 & 0.00652902793786

Process finished with exit code 0