DATA DICTIONARY - Human Activity Recognition Using Smartphones

Subject 30

People put to test

1:30

Activity 6

Activities code

1 Laying

2 Sitting

3 Standing

4 Walking

5 Walking Downstairs

6 Walking Upstairs

tBodyAccmeanX

Mean Time body accelerometer X axial raw signals

0.222 0.261 0.279 0.277 0.289

tBodyAccmeanY

Mean Time body accelerometer Y axial raw signals

-0.04051 -0.00131 -0.01614 -0.01738

tBodyAccmeanZ

Mean Time body accelerometer Z axial raw signals

-0.113 -0.105 -0.111 -0.111 -0.108

tBodyAccstdX

Standard Deviation Time body accelerometer X axial raw signals

-0.928 -0.977 -0.996 -0.284 0.03

tBodyAccstdY

Standard Deviation Time body accelerometer Y axial raw signals

-0.928 -0.977 -0.996 -0.284 0.03

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tBodyAccJerkmeanX

Mean Time body Accelerometer Jerk X axial raw signals

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tBodyGyromeanX

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angle(tBodyAccMean,gravity)

averaging the signals in a signal window sample used on the angle() variable

angle(tBodyAccJerkMean),gravityMean)

averaging the signals in a signal window sample used on the angle() variable

angle(tBodyGyroMean,gravityMean)

averaging the signals in a signal window sample used on the angle() variable

angle(tBodyGyroJerkMean,gravityMean)

averaging the signals in a signal window sample used on the angle() variable

angle(X,gravityMean)

averaging the signals in a signal window sample used on the angle() variable

angle(Y,gravityMean)

averaging the signals in a signal window sample used on the angle() variable

Data Set Information:

The experiments have been carried out with a group of 30 volunteers within an age bracket of 19-48 years. Each person performed six activities (WALKING, WALKING\_UPSTAIRS, WALKING\_DOWNSTAIRS, SITTING, STANDING, LAYING) wearing a smartphone (Samsung Galaxy S II) on the waist. Using its embedded accelerometer and gyroscope, we captured 3-axial linear acceleration and 3-axial angular velocity at a constant rate of 50Hz. The experiments have been video-recorded to label the data manually. The obtained dataset has been randomly partitioned into two sets, where 70% of the volunteers was selected for generating the training data and 30% the test data.   
  
The sensor signals (accelerometer and gyroscope) were pre-processed by applying noise filters and then sampled in fixed-width sliding windows of 2.56 sec and 50% overlap (128 readings/window). The sensor acceleration signal, which has gravitational and body motion components, was separated using a Butterworth low-pass filter into body acceleration and gravity. The gravitational force is assumed to have only low frequency components, therefore a filter with 0.3 Hz cutoff frequency was used. From each window, a vector of features was obtained by calculating variables from the time and frequency domain.  
  
Check the README.txt file for further details about this dataset.   
  
A video of the experiment including an example of the 6 recorded activities with one of the participants can be seen in the following link: [[Web Link]](http://www.youtube.com/watch?v=XOEN9W05_4A)  
  
An updated version of this dataset can be found at [[Web Link]](http://archive.ics.uci.edu/ml/datasets/Smartphone-Based+Recognition+of+Human+Activities+and+Postural+Transitions). It includes labels of postural transitions between activities and also the full raw inertial signals instead of the ones pre-processed into windows.

Attribute Information:

For each record in the dataset it is provided:   
- Triaxial acceleration from the accelerometer (total acceleration) and the estimated body acceleration.   
- Triaxial Angular velocity from the gyroscope.   
- A 561-feature vector with time and frequency domain variables.   
- Its activity label.   
- An identifier of the subject who carried out the experiment.

Relevant Papers:

Davide Anguita, Alessandro Ghio, Luca Oneto, Xavier Parra and Jorge L. Reyes-Ortiz. Human Activity Recognition on Smartphones using a Multiclass Hardware-Friendly Support Vector Machine. International Workshop of Ambient Assisted Living (IWAAL 2012). Vitoria-Gasteiz, Spain. Dec 2012   
  
Davide Anguita, Alessandro Ghio, Luca Oneto, Xavier Parra, Jorge L. Reyes-Ortiz. Energy Efficient Smartphone-Based Activity Recognition using Fixed-Point Arithmetic. Journal of Universal Computer Science. Special Issue in Ambient Assisted Living: Home Care. Volume 19, Issue 9. May 2013  
  
Davide Anguita, Alessandro Ghio, Luca Oneto, Xavier Parra and Jorge L. Reyes-Ortiz. Human Activity Recognition on Smartphones using a Multiclass Hardware-Friendly Support Vector Machine. 4th International Workshop of Ambient Assited Living, IWAAL 2012, Vitoria-Gasteiz, Spain, December 3-5, 2012. Proceedings. Lecture Notes in Computer Science 2012, pp 216-223.   
  
Jorge Luis Reyes-Ortiz, Alessandro Ghio, Xavier Parra-Llanas, Davide Anguita, Joan Cabestany, Andreu Català. Human Activity and Motion Disorder Recognition: Towards Smarter Interactive Cognitive Environments. 21th European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning, ESANN 2013. Bruges, Belgium 24-26 April 2013.