Course Project Code Book

Experiment description

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.

Dataset

Presented dataset contains summary table for average values of mean and stadart deviation for raw and post-processed measurments gained during experiment.

Parameters	
subject_id	A unique ID for each participant in an experiment
activity WALKING WALKING_UPSTAIRS WALKING_DOWNSTAIRS SITTING STANDING LAYING	Characterization of activity performed by participants
Mean Variables	
1-tBodyAcc-Mean-X **2-tBodyAcc-Mean-Y** **3-tBodyAcc-Mean-Z** **41-tGravityAcc-Mean-X** **42-tGravityAcc-Mean-Y** **43-tGravityAcc-Mean-Z** **81-tBodyAccJerk-Mean-X** **82-tBodyAccJerk-Mean-Y** **83-tBodyAccJerk-Mean-Z** **121-tBodyGyro-Mean-X** **122-tBodyGyro-Mean-Y** **123-tBodyGyro-Mean-Z**	Contains mean values for different measurments from the accelerometer and gyroscope. All measurments can be separated into sertain parterns: 1. "t" - time domain signals; "f" - frequency domain signals (appliance of FFT to the signals) 2. "Body" - body accelerated signal "Gravity" - gravity accelerated signal 3. "Acc" - data from an accelerometer

161-tBodyGyroJerk-Mean-X	"Gyro" - data from a gyroscope
162-tBodyGyroJerk-Mean-Y	
163-tBodyGyroJerk-Mean-Z	4. "Jerk" - jerk signals
201-tBodyAccMag-Mean	
214-tGravityAccMag-Mean	5. "Mag" - magnitude calculation of three-dimensional signals
227-tBodyAccJerkMag-Mean	using Euclidean norm
240-tBodyGyroMag-Mean	
253-tBodyGyroJerkMag-Mean	6. "X", "Y", "Z" - dimensions of the signals
266-fBodyAcc-Mean-X	
267-fBodyAcc-Mean-Y	
268-fBodyAcc-Mean-Z	
345-fBodyAccJerk-Mean-X	
346-fBodyAccJerk-Mean-Y	
347-fBodyAccJerk-Mean-Z	
424-fBodyGyro-Mean-X	
425-fBodyGyro-Mean-Y	
426-fBodyGyro-Mean-Z	
503-fBodyAccMag-Mean	
516-fBodyBodyAccJerkMag-Mean	
529-fBodyBodyGyroMag-Mean	
542-fBodyBodyGyroJerkMag-Mean	

Standart Deviation Vairables	
4-tBodyAcc-StDeviation-X	Contains standart deviation values for different measurments
5-tBodyAcc-StDeviation-Y	from the accelerometer and gyroscope.
6-tBodyAcc-StDeviation-Z	
44-tGravityAcc-StDeviation-X	All measurments can be separated into sertain parterns:
45-tGravityAcc-StDeviation-Y	
46-tGravityAcc-StDeviation-Z	1. "t" - time domain signals;
84-tBodyAccJerk-StDeviation-X	"f" - frequency domain signals (appliance of FFT to the signals)
85-tBodyAccJerk-StDeviation-Y	
86-tBodyAccJerk-StDeviation-Z	2. "Body" - body accelerated signal
124-tBodyGyro-StDeviation-X	"Gravity" - gravity accelerated signal
125-tBodyGyro-StDeviation-Y	
126-tBodyGyro-StDeviation-Z	3. "Acc" - data from an accelerometer
164-tBodyGyroJerk-StDeviation-X	"Gyro" - data from a gyroscope
165-tBodyGyroJerk-StDeviation-Y	
166-tBodyGyroJerk-StDeviation-Z	4. "Jerk" - jerk signals
202-tBodyAccMag-StDeviation	
215-tGravityAccMag-StDeviation	5. "Mag" - magnitude calculation of three-dimensional signals
228-tBodyAccJerkMag-StDeviation	using Euclidean norm
241-tBodyGyroMag-StDeviation	
254-tBodyGyroJerkMag-StDeviation	6. "X", "Y", "Z" - dimensions of the signals
269-fBodyAcc-StDeviation-X	
270-fBodyAcc-StDeviation-Y	
271-fBodyAcc-StDeviation-Z	
348-fBodyAccJerk-StDeviation-X	
349-fBodyAccJerk-StDeviation-Y	
350-fBodyAccJerk-StDeviation-Z	
427-fBodyGyro-StDeviation-X	

428-fBodyGyro-StDeviation-Y
429-fBodyGyro-StDeviation-Z
504-fBodyAccMag-StDeviation

Standart Deviation Vairables

517-fBodyBodyAccJerkMag-StDeviation
530-fBodyBodyGyroMag-StDeviation
543-fBodyBodyGyroJerkMag-StDeviation