# **CODEBOOK**

## 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.  
  
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.

## Citation Request:

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<http://archive.ics.uci.edu/ml/datasets/Human+Activity+Recognition+Using+Smartphones>

## Variable list and descriptions

|  |  |
| --- | --- |
| **Variable** | **Description** |
| activities | The activity performed |
| subject | Subject ID |
| timeBodyAcc-mean-X | Mean time for acceleration of body for X direction |
| timeBodyAcc-mean-Y | Mean time for acceleration of body for Y direction |
| timeBodyAcc-mean-Z | Mean time for acceleration of body for Z direction |
| timeBodyAcc-std-X | Standard deviation of time for acceleration of body for X direction |
| timeBodyAcc-std-Y | Standard deviation of time for acceleration of body for Y direction |
| timeBodyAcc-std-Z | Standard deviation of time for acceleration of body for Z direction |
| timeGravityAcc-mean-X | Mean time of acceleration of gravity for X direction |
| timeGravityAcc-mean-Y | Mean time of acceleration of gravity for Y direction |
| timeGravityAcc-mean-Z | Mean time of acceleration of gravity for Z direction |
| timeGravityAcc-std-X | Standard deviation of time of acceleration of gravity for X direction |
| timeGravityAcc-std-Y | Standard deviation of time of acceleration of gravity for Y direction |
| timeGravityAcc-std-Z | Standard deviation of time of acceleration of gravity for Z direction |
| timeBodyAccJerk-mean-X | Mean time of body acceleration jerk for X direction |
| timeBodyAccJerk-mean-Y | Mean time of body acceleration jerk for Y direction |
| timeBodyAccJerk-mean-Z | Mean time of body acceleration jerk for Z direction |
| timeBodyAccJerk-std-X | Standard deviation of time of body acceleration jerk for X direction |
| timeBodyAccJerk-std-Y | Standard deviation of time of body acceleration jerk for Y direction |
| timeBodyAccJerk-std-Z | Standard deviation of time of body acceleration jerk for Z direction |
| timeBodyGyro-mean-X | Mean body gyroscope measurement for X direction |
| timeBodyGyro-mean-Y | Mean body gyroscope measurement for Y direction |
| timeBodyGyro-mean-Z | Mean body gyroscope measurement for Z direction |
| timeBodyGyro-std-X | Standard deviation of body gyroscope measurement for X direction |
| timeBodyGyro-std-Y | Standard deviation of body gyroscope measurement for Y direction |
| timeBodyGyro-std-Z | Standard deviation of body gyroscope measurement for Z direction |
| timeBodyGyroJerk-mean-X | Mean jerk signal of body for X direction |
| timeBodyGyroJerk-mean-Y | Mean jerk signal of body for Y direction |
| timeBodyGyroJerk-mean-Z | Mean jerk signal of body for Z direction |
| timeBodyGyroJerk-std-X | Standard deviation of jerk signal of body for X direction |
| timeBodyGyroJerk-std-Y | Standard deviation of jerk signal of body for Y direction |
| timeBodyGyroJerk-std-Z | Standard deviation of jerk signal of body for Z direction |
| timeBodyAccMag-mean | Mean magnitude of body Acc |
| timeBodyAccMag-std | Standard deviation of magnitude of body Acc |
| timeGravityAccMag-mean | Mean gravity acceleration magnitude |
| timeGravityAccMag-std | Standard deviation of gravity acceleration magnitude |
| timeBodyAccJerkMag-mean | Mean magnitude of body acceleration jerk |
| timeBodyAccJerkMag-std | Standard deviation of magnitude of body acceleration jerk |
| timeBodyGyroMag-mean | Mean magnitude of body gyroscope measurement |
| timeBodyGyroMag-std | Standard deviation of magnitude of body gyroscope measurement |
| timeBodyGyroJerkMag-mean | Mean magnitude of body body gyroscope jerk measurement |
| timeBodyGyroJerkMag-std | Standard deviation of magnitude of body body gyroscope jerk measurement |
| frequenceBodyAcc-mean-X | Mean frequency of body acceleration for X direction |
| frequenceBodyAcc-mean-Y | Mean frequency of body acceleration for Y direction |
| frequenceBodyAcc-mean-Z | Mean frequency of body acceleration for Z direction |
| frequenceBodyAcc-std-X | Standard deviation of frequency of body acceleration for X direction |
| frequenceBodyAcc-std-Y | Standard deviation of frequency of body acceleration for Y direction |
| frequenceBodyAcc-std-Z | Standard deviation of frequency of body acceleration for Z direction |
| frequenceBodyAccJerk-mean-X | Mean frequency of body accerlation jerk for X direction |
| frequenceBodyAccJerk-mean-Y | Mean frequency of body accerlation jerk for Y direction |
| frequenceBodyAccJerk-mean-Z | Mean frequency of body accerlation jerk for Z direction |
| frequenceBodyAccJerk-std-X | Standard deviation frequency of body accerlation jerk for X direction |
| frequenceBodyAccJerk-std-Y | Standard deviation frequency of body accerlation jerk for Y direction |
| frequenceBodyAccJerk-std-Z | Standard deviation frequency of body accerlation jerk for Z direction |
| frequenceBodyGyro-mean-X | Mean frequency of body gyroscope measurement for X direction |
| frequenceBodyGyro-mean-Y | Mean frequency of body gyroscope measurement for Y direction |
| frequenceBodyGyro-mean-Z | Mean frequency of body gyroscope measurement for Z direction |
| frequenceBodyGyro-std-X | Standard deviation frequency of body gyroscope measurement for X direction |
| frequenceBodyGyro-std-Y | Standard deviation frequency of body gyroscope measurement for Y direction |
| frequenceBodyGyro-std-Z | Standard deviation frequency of body gyroscope measurement for Z direction |
| frequenceBodyAccMag-mean | Mean frequency of body acceleration magnitude |
| frequenceBodyAccMag-std | Standard deviation of frequency of body acceleration magnitude |
| frequenceBodyBodyAccJerkMag-mean | Mean frequency of body acceleration jerk magnitude |
| frequenceBodyBodyAccJerkMag-std | Standard deviation of frequency of body acceleration jerk magnitude |
| frequenceBodyBodyGyroMag-mean | Mean frequency of magnitude of body gyroscope measurement |
| frequenceBodyBodyGyroMag-std | Standard deviation of frequency of magnitude of body gyroscope measurement |
| frequenceBodyBodyGyroJerkMag-mean | Mean frequency of magnitude of body gyroscope jerk measurement |
| frequenceBodyBodyGyroJerkMag-std | Standard deviation frequency of magnitude of body gyroscope jerk measurement |