# 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.
* Its activity label.

## Citation Request

[1] 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

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

### Variable Descriptions

|  |  |
| --- | --- |
| **VARIABLE** | **DESCRIPTION** |
| Subject | Subject Id |
| Activity | The activity Performed |
| TimeDomain.BodyAcceleration.Mean...X | Mean time for acceleration of body for X direction |
| TimeDomain.BodyAcceleration.Mean...Y | Mean time for acceleration of body for Y direction |
| TimeDomain.BodyAcceleration.Mean...Z | Mean time for acceleration of body for Z direction |
| TimeDomain.BodyAcceleration.StandardDeviation...X | Standard deviation of time for acceleration of body for X direction |
| TimeDomain.BodyAcceleration.StandardDeviation...Y | Standard deviation of time for acceleration of body for Y direction |
| TimeDomain.BodyAcceleration.StandardDeviation...Z | Standard deviation of time for acceleration of body for Z direction |
| TimeDomain.GravityAcceleration.Mean...X | Mean time of acceleration of gravity for X direction |
| TimeDomain.GravityAcceleration.Mean...Y | Mean time of acceleration of gravity for Y direction |
| TimeDomain.GravityAcceleration.Mean...Z | Mean time of acceleration of gravity for Z direction |
| TimeDomain.GravityAcceleration.StandardDeviation...X | Standard deviation of time of acceleration of gravity for X direction |
| TimeDomain.GravityAcceleration.StandardDeviation...Y | Standard deviation of time of acceleration of gravity for Y direction |
| TimeDomain.GravityAcceleration.StandardDeviation...Z | Standard deviation of time of acceleration of gravity for Z direction |
| TimeDomain.BodyAccelerationJerk.Mean...X | Mean time of body acceleration jerk for X direction |
| TimeDomain.BodyAccelerationJerk.Mean...Y | Mean time of body acceleration jerk for Y direction |
| TimeDomain.BodyAccelerationJerk.Mean...Z | Mean time of body acceleration jerk for Z direction |
| TimeDomain.BodyAccelerationJerk.StandardDeviation...X | Standard deviation of time of body acceleration jerk for X direction |
| TimeDomain.BodyAccelerationJerk.StandardDeviation...Y | Standard deviation of time of body acceleration jerk for Y direction |
| TimeDomain.BodyAccelerationJerk.StandardDeviation...Z | Standard deviation of time of body acceleration jerk for Z direction |
| TimeDomain.BodyAngularSpeed.Mean...X | Mean body gyroscope measurement for X direction |
| TimeDomain.BodyAngularSpeed.Mean...Y | Mean body gyroscope measurement for Y direction |
| TimeDomain.BodyAngularSpeed.Mean...Z | Mean body gyroscope measurement for Z direction |
| TimeDomain.BodyAngularSpeed.StandardDeviation...X | Standard deviation of body gyroscope measurement for X direction |
| TimeDomain.BodyAngularSpeed.StandardDeviation...Y | Standard deviation of body gyroscope measurement for Y direction |
| TimeDomain.BodyAngularSpeed.StandardDeviation...Z | Standard deviation of body gyroscope measurement for Z direction |
| TimeDomain.BodyAngularAcceleration.Mean...X | Mean jerk signal of body for X direction |
| TimeDomain.BodyAngularAcceleration.Mean...Y | Mean jerk signal of body for Y direction |
| TimeDomain.BodyAngularAcceleration.Mean...Z | Mean jerk signal of body for Z direction |
| TimeDomain.BodyAngularAcceleration.StandardDeviation...X | Standard deviation of jerk signal of body for X direction |
| TimeDomain.BodyAngularAcceleration.StandardDeviation...Y | Standard deviation of jerk signal of body for Y direction |
| TimeDomain.BodyAngularAcceleration.StandardDeviation...Z | Standard deviation of jerk signal of body for Z direction |
| TimeDomain.BodyAccelerationMagnitude.Mean.. | Mean magnitude of body Acc |
| TimeDomain.BodyAccelerationMagnitude.StandardDeviation.. | Standard deviation of magnitude of body Acc |
| TimeDomain.GravityAccelerationMagnitude.Mean.. | Mean gravity acceleration magnitude |
| TimeDomain.GravityAccelerationMagnitude.StandardDeviation.. | Standard deviation of gravity acceleration magnitude |
| TimeDomain.BodyAccelerationJerkMagnitude.Mean.. | Mean magnitude of body acceleration jerk |
| TimeDomain.BodyAccelerationJerkMagnitude.StandardDeviation.. | Standard deviation of magnitude of body acceleration jerk |
| TimeDomain.BodyAngularSpeedMagnitude.Mean.. | Mean magnitude of body gyroscope measurement |
| TimeDomain.BodyAngularSpeedMagnitude.StandardDeviation.. | Standard deviation of magnitude of body gyroscope measurement |
| TimeDomain.BodyAngularAccelerationMagnitude.Mean.. | Mean magnitude of body body gyroscope jerk measurement |
| TimeDomain.BodyAngularAccelerationMagnitude.StandardDeviation.. | Standard deviation of magnitude of body body gyroscope jerk measurement |
| FrequencyDomain.BodyAcceleration.Mean...X | Mean frequency of body acceleration for X direction |
| FrequencyDomain.BodyAcceleration.Mean...Y | Mean frequency of body acceleration for Y direction |
| FrequencyDomain.BodyAcceleration.Mean...Z | Mean frequency of body acceleration for Z direction |
| FrequencyDomain.BodyAcceleration.StandardDeviation...X | Standard deviation of frequency of body acceleration for X direction |
| FrequencyDomain.BodyAcceleration.StandardDeviation...Y | Standard deviation of frequency of body acceleration for Y direction |
| FrequencyDomain.BodyAcceleration.StandardDeviation...Z | Standard deviation of frequency of body acceleration for Z direction |
| FrequencyDomain.BodyAccelerationJerk.Mean...X | Mean frequency of body accerlation jerk for X direction |
| FrequencyDomain.BodyAccelerationJerk.Mean...Y | Mean frequency of body accerlation jerk for Y direction |
| FrequencyDomain.BodyAccelerationJerk.Mean...Z | Mean frequency of body accerlation jerk for Z direction |
| FrequencyDomain.BodyAccelerationJerk.StandardDeviation...X | Standard deviation frequency of body accerlation jerk for X direction |
| FrequencyDomain.BodyAccelerationJerk.StandardDeviation...Y | Standard deviation frequency of body accerlation jerk for Y direction |
| FrequencyDomain.BodyAccelerationJerk.StandardDeviation...Z | Standard deviation frequency of body accerlation jerk for Z direction |
| FrequencyDomain.BodyAngularSpeed.Mean...X | Mean frequency of body gyroscope measurement for X direction |
| FrequencyDomain.BodyAngularSpeed.Mean...Y | Mean frequency of body gyroscope measurement for Y direction |
| FrequencyDomain.BodyAngularSpeed.Mean...Z | Mean frequency of body gyroscope measurement for Z direction |
| FrequencyDomain.BodyAngularSpeed.StandardDeviation...X | Standard deviation frequency of body gyroscope measurement for X direction |
| FrequencyDomain.BodyAngularSpeed.StandardDeviation...Y | Standard deviation frequency of body gyroscope measurement for Y direction |
| FrequencyDomain.BodyAngularSpeed.StandardDeviation...Z | Standard deviation frequency of body gyroscope measurement for Z direction |
| FrequencyDomain.BodyAccelerationMagnitude.Mean.. | Mean frequency of body acceleration magnitude |
| FrequencyDomain.BodyAccelerationMagnitude.StandardDeviation.. | Standard deviation of frequency of body acceleration magnitude |
| FrequencyDomain.BodyBodyAccelerationJerkMagnitude.Mean.. | Mean frequency of body acceleration jerk magnitude |
| FrequencyDomain.BodyBodyAccelerationJerkMagnitude.StandardDeviation.. | Standard deviation of frequency of body acceleration jerk magnitude |
| FrequencyDomain.BodyBodyAngularSpeedMagnitude.Mean.. | Mean frequency of magnitude of body gyroscope measurement |
| FrequencyDomain.BodyBodyAngularSpeedMagnitude.StandardDeviation.. | Standard deviation of frequency of magnitude of body gyroscope measurement |
| FrequencyDomain.BodyBodyAngularAccelerationMagnitude.Mean.. | Mean frequency of magnitude of body gyroscope jerk measurement |
| FrequencyDomain.BodyBodyAngularAccelerationMagnitude.StandardDeviation.. | Standard deviation frequency of magnitude of body gyroscope jerk measurement |