# **Overview**

# This code book will describe the data used in this project, as well as the processing required to create the resulting tidy data set.

# 30 volunteers performed 6 different activities while wearing a smartphone. The smartphone captured various data about their movements.

# **Study Information**

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

# **Data Set**

# <https://d396qusza40orc.cloudfront.net/getdata%2Fprojectfiles%2FUCI%20HAR%20Dataset.zip>

# **Analysis Variables**

|  |  |
| --- | --- |
| **Variable** | **Description** |
| activity | The activity performed. |
| subject\_id | The ID of the subject. |
| tBodyAcc-mean()-X | Mean time for acceleration of body for X direction. |
| tBodyAcc-mean()-Y | Mean time for acceleration of body for Y direction. |
| tBodyAcc-mean()-Z | Mean time for acceleration of body for Z direction. |
| tBodyAcc-std()-X | Standard deviation of time for acceleration of body for X direction. |
| tBodyAcc-std()-Y | Standard deviation of time for acceleration of body for Y direction. |
| tBodyAcc-std()-Z | Standard deviation of time for acceleration of body for Z direction. |
| tGravityAcc-mean()-X | Mean time of acceleration of gravity for X direction. |
| tGravityAcc-mean()-Y | Mean time of acceleration of gravity for Y direction. |
| tGravityAcc-mean()-Z | Mean time of acceleration of gravity for Z direction. |
| tGravityAcc-std()-X | Standard deviation of time of acceleration of gravity for X direction. |
| tGravityAcc-std()-Y | Standard deviation of time of acceleration of gravity for Y direction. |
| tGravityAcc-std()-Z | Standard deviation of time of acceleration of gravity for Z direction. |
| tBodyAccJerk-mean()-X | Mean time of body acceleration jerk for X direction. |
| tBodyAccJerk-mean()-Y | Mean time of body acceleration jerk for Y direction |
| tBodyAccJerk-mean()-Z | Mean time of body acceleration jerk for Z direction |
| tBodyAccJerk-std()-X | Standard deviation of time of body acceleration jerk for X direction. |
| tBodyAccJerk-std()-Y | Standard deviation of time of body acceleration jerk for Y direction. |
| tBodyAccJerk-std()-Z | Standard deviation of time of body acceleration jerk for Z direction. |
| tBodyGyro-mean()-X | Mean body gyroscope measurement for X direction. |
| tBodyGyro-mean()-Y | Mean body gyroscope measurement for Y direction. |
| tBodyGyro-mean()-Z | Mean body gyroscope measurement for Z direction. |
| tBodyGyro-std()-X | Standard deviation of body gyroscope measurement for X direction. |
| tBodyGyro-std()-Y | Standard deviation of body gyroscope measurement for Y direction. |
| tBodyGyro-std()-Z | Standard deviation of body gyroscope measurement for Z direction. |
| tBodyGyroJerk-mean()-X | Mean jerk signal of body for X direction. |
| tBodyGyroJerk-mean()-Y | Mean jerk signal of body for Y direction. |
| tBodyGyroJerk-mean()-Z | Mean jerk signal of body for Z direction. |
| tBodyGyroJerk-std()-X | Standard deviation of jerk signal of body for X direction. |
| tBodyGyroJerk-std()-Y | Standard deviation of jerk signal of body for Y direction. |
| tBodyGyroJerk-std()-Z | Standard deviation of jerk signal of body for Z direction. |
| tBodyAccMag-mean() | Mean magnitude of body Acc |
| tBodyAccMag-std() | Standard deviation of magnitude of body Acc |
| tGravityAccMag-mean() | Mean gravity acceleration magnitude. |
| tGravityAccMag-std() | Standard deviation of gravity acceleration magnitude. |
| tBodyAccJerkMag-mean() | Mean magnitude of body acceleration jerk. |
| tBodyAccJerkMag-std() | Standard deviation of magnitude of body acceleration jerk. |
| tBodyGyroMag-mean() | Mean magnitude of body gyroscope measurement. |
| tBodyGyroMag-std() | Standard deviation of magnitude of body gyroscope measurement. |
| tBodyGyroJerkMag-mean() | Mean magnitude of body gyroscope jerk measurement. |
| tBodyGyroJerkMag-std() | Standard deviation of magnitude of body gyroscope jerk measurement. |
| fBodyAcc-mean()-X | Mean frequency of body acceleration for X direction. |
| fBodyAcc-mean()-Y | Mean frequency of body acceleration for Y direction. |
| fBodyAcc-mean()-Z | Mean frequency of body acceleration for Z direction. |
| fBodyAcc-std()-X | Standard deviation of frequency of body acceleration for X direction. |
| fBodyAcc-std()-Y | Standard deviation of frequency of body acceleration for Y direction. |
| fBodyAcc-std()-Z | Standard deviation of frequency of body acceleration for Z direction. |
| fBodyAccJerk-mean()-X | Mean frequency of body acceleration jerk for X direction. |
| fBodyAccJerk-mean()-Y | Mean frequency of body acceleration jerk for Y direction. |
| fBodyAccJerk-mean()-Z | Mean frequency of body acceleration jerk for Z direction. |
| fBodyAccJerk-std()-X | Standard deviation frequency of body acceleration jerk for X direction. |
| fBodyAccJerk-std()-Y | Standard deviation frequency of body acceleration jerk for Y direction. |
| fBodyAccJerk-std()-Z | Standard deviation frequency of body acceleration jerk for Z direction. |
| fBodyGyro-mean()-X | Mean frequency of body gyroscope measurement for X direction. |
| fBodyGyro-mean()-Y | Mean frequency of body gyroscope measurement for Y direction. |
| fBodyGyro-mean()-Z | Mean frequency of body gyroscope measurement for Z direction. |
| fBodyGyro-std()-X | Standard deviation frequency of body gyroscope measurement for X direction. |
| fBodyGyro-std()-Y | Standard deviation frequency of body gyroscope measurement for Y direction. |
| fBodyGyro-std()-Z | Standard deviation frequency of body gyroscope measurement for Z direction. |
| fBodyAccMag-mean() | Mean frequency of body acceleration magnitude. |
| fBodyAccMag-std() | Standard deviation of frequency of body acceleration magnitude. |
| fBodyBodyAccJerkMag-mean() | Mean frequency of body acceleration jerk magnitude. |
| fBodyBodyAccJerkMag-std() | Standard deviation of frequency of body acceleration jerk magnitude. |
| fBodyBodyGyroMag-mean() | Mean frequency of magnitude of body gyroscope measurement. |
| fBodyBodyGyroMag-std() | Standard deviation of frequency of magnitude of body gyroscope measurement. |
| fBodyBodyGyroJerkMag-mean() | Mean frequency of magnitude of body gyroscope jerk measurement. |

# **Processing steps**

# All of the relevant data files were read into data frames, appropriate column headers were added, and the training and test sets were combined into a single data set.

# All feature columns were removed that did not contain the exact string "mean()" or "std()". This left 66 feature columns, plus the subject\_id and activity columns.

# The activity column was converted from a integer to a factor, using labels describing the activities.

# A tidy data set was created containing the mean of each feature for each subject and each activity. Thus, subject #1 has 6 rows in the tidy data set (one row for each activity), and each row contains the mean value for each of the 66 features for that subject/activity combination. Since there are 30 subjects, there are a total of 180 rows.

# The tidy data set was output to a txt file.