DATA DICTIONARY

Acknowledgement

This code book is created based on the information provided in the following reference files under the license following publication [1]:

- Reference-README.txt
- Reference-features.txt
- Reference-features_info.txt

[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

Background of Data Source

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. See 'features_info.txt' for more details.

For each record 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.

Data Specification

This code book describes the variables found in the tidy data file (name “tidydata.txt”) created by script “run_analysis.R”.

The following is the list of column names found in the first row of “tidydata.txt”.

Note that columns 3 to 68 correspond to the average (mean) and average (standard deviation) for each measurement captured in the experiment for each activity and each subject.

No.	Column Name	Description
1	subject	Unique identifier of the 30 volunteers, ranging from 1 to 30.
2	activityLabel	Label of the six activities performed by the subject. Valid values: WALKING, WALKING_UPSTAIRS, WALKING_DOWNSTAIRS, SITTING, STANDING, LAYING
	NoteA: *For readability and avoiding over lengthy name, run_analysis.R transform the original column name by replacing the special characters such as – and () with a single dot.* *The transformed name remained descriptive with appropriate abbreviation and separation of component by fullstop (.).*	*NoteB:* *The mapping below shows the column name in the source file downloaded from the source site.*
3	tBodyAcc.mean.X	tBodyAcc-mean()-X
4	tBodyAcc.mean.Y	tBodyAcc-mean()-Y
5	tBodyAcc.mean.Z	tBodyAcc-mean()-Z
6	tBodyAcc.std.X	tBodyAcc-std()-X
7	tBodyAcc.std.Y	tBodyAcc-std()-Y
8	tBodyAcc.std.Z	tBodyAcc-std()-Z
9	tGravityAcc.mean.X	tGravityAcc-mean()-X
10	tGravityAcc.mean.Y	tGravityAcc-mean()-Y
11	tGravityAcc.mean.Z	tGravityAcc-mean()-Z
12	tGravityAcc.std.X	tGravityAcc-std()-X
13	tGravityAcc.std.Y	tGravityAcc-std()-Y

14	tGravityAcc.std.Z	tGravityAcc-std()-Z
15	tBodyAccJerk.mean.X	tBodyAccJerk-mean()-X
16	tBodyAccJerk.mean.Y	tBodyAccJerk-mean()-Y
17	tBodyAccJerk.mean.Z	tBodyAccJerk-mean()-Z
18	tBodyAccJerk.std.X	tBodyAccJerk-std()-X
19	tBodyAccJerk.std.Y	tBodyAccJerk-std()-Y
20	tBodyAccJerk.std.Z	tBodyAccJerk-std()-Z
21	tBodyGyro.mean.X	tBodyGyro-mean()-X
22	tBodyGyro.mean.Y	tBodyGyro-mean()-Y
23	tBodyGyro.mean.Z	tBodyGyro-mean()-Z
24	tBodyGyro.std.X	tBodyGyro-std()-X
25	tBodyGyro.std.Y	tBodyGyro-std()-Y
26	tBodyGyro.std.Z	tBodyGyro-std()-Z
27	tBodyGyroJerk.mean.X	tBodyGyroJerk-mean()-X
28	tBodyGyroJerk.mean.Y	tBodyGyroJerk-mean()-Y
29	tBodyGyroJerk.mean.Z	tBodyGyroJerk-mean()-Z
30	tBodyGyroJerk.std.X	tBodyGyroJerk-std()-X
31	tBodyGyroJerk.std.Y	tBodyGyroJerk-std()-Y
32	tBodyGyroJerk.std.Z	tBodyGyroJerk-std()-Z
33	tBodyAccMag.mean	tBodyAccMag-mean()
34	tBodyAccMag.std	tBodyAccMag-std()
35	tGravityAccMag.mean	tGravityAccMag-mean()
36	tGravityAccMag.std	tGravityAccMag-std()
37	tBodyAccJerkMag.mean	tBodyAccJerkMag-mean()
38	tBodyAccJerkMag.std	tBodyAccJerkMag-std()
39	tBodyGyroMag.mean	tBodyGyroMag-mean()
40	tBodyGyroMag.std	tBodyGyroMag-std()
41	tBodyGyroJerkMag.mean	tBodyGyroJerkMag-mean()
42	tBodyGyroJerkMag.std	tBodyGyroJerkMag-std()
43	fBodyAcc.mean.X	fBodyAcc-mean()-X

44	fBodyAcc.mean.Y	fBodyAcc-mean()-Y
45	fBodyAcc.mean.Z	fBodyAcc-mean()-Z
46	fBodyAcc.std.X	fBodyAcc-std()-X
47	fBodyAcc.std.Y	fBodyAcc-std()-Y
48	fBodyAcc.std.Z	fBodyAcc-std()-Z
49	fBodyAccJerk.mean.X	fBodyAccJerk-mean()-X
50	fBodyAccJerk.mean.Y	fBodyAccJerk-mean()-Y
51	fBodyAccJerk.mean.Z	fBodyAccJerk-mean()-Z
52	fBodyAccJerk.std.X	fBodyAccJerk-std()-X
53	fBodyAccJerk.std.Y	fBodyAccJerk-std()-Y
54	fBodyAccJerk.std.Z	fBodyAccJerk-std()-Z
55	fBodyGyro.mean.X	fBodyGyro-mean()-X
56	fBodyGyro.mean.Y	fBodyGyro-mean()-Y
57	fBodyGyro.mean.Z	fBodyGyro-mean()-Z
58	fBodyGyro.std.X	fBodyGyro-std()-X
59	fBodyGyro.std.Y	fBodyGyro-std()-Y
60	fBodyGyro.std.Z	fBodyGyro-std()-Z
61	fBodyAccMag.mean	fBodyAccMag-mean()
62	fBodyAccMag.std	fBodyAccMag-std()
63	fBodyBodyAccJerkMag.mean	fBodyBodyAccJerkMag-mean()
64	fBodyBodyAccJerkMag.std	fBodyBodyAccJerkMag-std()
65	fBodyBodyGyroMag.mean	fBodyBodyGyroMag-mean()
66	fBodyBodyGyroMag.std	fBodyBodyGyroMag-std()
67	fBodyBodyGyroJerkMag.mean	fBodyBodyGyroJerkMag-mean()
68	fBodyBodyGyroJerkMag.std	fBodyBodyGyroJerkMag-std()