

Codebook

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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.

Variable overview

	Variable Name	Class
1	PersonID	Integer
2	ActivityName	Factor
3	tBodyAcc-mean()-X	Numeric
4	tBodyAcc-mean()-Y	Numeric
5	tBodyAcc-mean()-Z	Numeric
6	tBodyAcc-std()-X	Numeric
7	tBodyAcc-std()-Y	Numeric
8	tBodyAcc-std()-Z	Numeric
9	tGravityAcc-mean()-X	Numeric
10	tGravityAcc-mean()-Y	Numeric
11	tGravityAcc-mean()-Z	Numeric
12	tGravityAcc-std()-X	Numeric
13	tGravityAcc-std()-Y	Numeric
14	tGravityAcc-std()-Z	Numeric
15	tBodyAccJerk-mean()-X	Numeric
16	tBodyAccJerk-mean()-Y	Numeric
17	tBodyAccJerk-mean()-Z	Numeric
18	tBodyAccJerk-std()-X	Numeric

19	tBodyAccJerk-std()-Y	Numeric
20	tBodyAccJerk-std()-Z	Numeric
21	tBodyGyro-mean()-X	Numeric
22	tBodyGyro-mean()-Y	Numeric
23	tBodyGyro-mean()-Z	Numeric
24	tBodyGyro-std()-X	Numeric
25	tBodyGyro-std()-Y	Numeric
26	tBodyGyro-std()-Z	Numeric
27	tBodyGyroJerk-mean()-X	Numeric
28	tBodyGyroJerk-mean()-Y	Numeric
29	tBodyGyroJerk-mean()-Z	Numeric
30	tBodyGyroJerk-std()-X	Numeric
31	tBodyGyroJerk-std()-Y	Numeric
32	tBodyGyroJerk-std()-Z	Numeric
33	tBodyAccMag-mean()	Numeric
34	tBodyAccMag-std()	Numeric
35	tGravityAccMag-mean()	Numeric
36	tGravityAccMag-std()	Numeric
37	tBodyAccJerkMag-mean()	Numeric

38	tBodyAccJerkMag-std()	Numeric
39	tBodyGyroMag-mean()	Numeric
40	tBodyGyroMag-std()	Numeric
41	tBodyGyroJerkMag-mean()	Numeric
42	tBodyGyroJerkMag-std()	Numeric
43	fBodyAcc-mean()-X	Numeric
44	fBodyAcc-mean()-Y	Numeric
45	fBodyAcc-mean()-Z	Numeric
46	fBodyAcc-std()-X	Numeric
47	fBodyAcc-std()-Y	Numeric
48	fBodyAcc-std()-Z	Numeric
49	fBodyAcc-meanFreq()-X	Numeric
50	fBodyAcc-meanFreq()-Y	Numeric
51	fBodyAcc-meanFreq()-Z	Numeric
52	fBodyAccJerk-mean()-X	Numeric
53	fBodyAccJerk-mean()-Y	Numeric
54	fBodyAccJerk-mean()-Z	Numeric
55	fBodyAccJerk-std()-X	Numeric
56	fBodyAccJerk-std()-Y	Numeric

57	fBodyAccJerk-std()-Z	Numeric
58	fBodyAccJerk-meanFreq()-X	Numeric
59	fBodyAccJerk-meanFreq()-Y	Numeric
60	fBodyAccJerk-meanFreq()-Z	Numeric
61	fBodyGyro-mean()-X	Numeric
62	fBodyGyro-mean()-Y	Numeric
63	fBodyGyro-mean()-Z	Numeric
64	fBodyGyro-std()-X	Numeric
65	fBodyGyro-std()-Y	Numeric
66	fBodyGyro-std()-Z	Numeric
67	fBodyGyro-meanFreq()-X	Numeric
68	fBodyGyro-meanFreq()-Y	Numeric
69	fBodyGyro-meanFreq()-Z	Numeric
70	fBodyAccMag-mean()	Numeric
71	fBodyAccMag-std()	Numeric
72	fBodyAccMag-meanFreq()	Numeric
73	fBodyBodyAccJerkMag-mean()	Numeric
74	fBodyBodyAccJerkMag-std()	Numeric
75	fBodyBodyAccJerkMag-meanFreq()	Numeric

76	fBodyBodyGyroMag-mean()	Numeric
77	fBodyBodyGyroMag-std()	Numeric
78	fBodyBodyGyroMag-meanFreq()	Numeric
79	fBodyBodyGyroJerkMag-mean()	Numeric
80	fBodyBodyGyroJerkMag-std()	Numeric
81	fBodyBodyGyroJerkMag-meanFreq()	Numeric
82	angle(tBodyAccMean,gravity)	Numeric
83	angle(tBodyAccJerkMean),gravity Mean)	Numeric
84	angle(tBodyGyroMean,gravityMe an)	Numeric
85	angle(tBodyGyroJerkMean,gravit yMean)	Numeric
86	angle(X,gravityMean)	Numeric
87	angle(Y,gravityMean)	Numeric
88	angle(Z,gravityMean)	Numeric