Human Activity Recognition Using Smartphones Dataset

BIBLIOGRAPHIC CITATION

Davide Anguita, Alessandro Ghio, Luca Oneto, Xavier Parra and Jorge L. Reyes-Ortiz. A Public Domain Dataset for Human Activity Recognition Using Smartphones. 21th European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning, ESANN 2013. Bruges, Belgium 24-26 April 2013.

Human Activity Recognition database built from the recordings of 30 subjects performing activities of daily living (ADL) while carrying a waist-mounted smartphone with embedded inertial sensors.

DATA COLLECTION DESCRIPTION

SUMMARY:

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.

What is provided?

- Tri-axial acceleration from the accelerometer
- Tri-axial Angular velocity from the gyroscope
- A 561-features are variables
- Activity label for each activity
- Subject who carried an activity

EXTENT OF COLLECTION:

DATA FILES

1. Subject_Test.txt –
   All subjects in the order of the observations of the Test experiment
2. X_Test.txt –
   All the observations for all the features for Test Subjects
3. Y_Test.txt –
   All the activities in the order of the observation aligning to the subjects in subjects_test.txt
4. Subject_Train.txt –
   All subjects in the order of the observations of the Training experiment
5. X_Train.txt –
   All the observations for all the features for Training Subjects
6. Y_Train.txt –
   All the activities in the order of the observation aligning to the subjects in subjects_train.txt

META DATA FILES

1. Features.txt –
   Provides details of each variable (column) in X_Test.txt or X_train.txt
2. Features_info.txt –
   Provides details and meaning for each feature in Features.txt
3. Activity_labels.txt –
   Provides labels to the activities in Y_test.txt or Y_Train.txt files.

SUMMARY OF FILES

Part 1: Observations on X axis TEST
File Structure: Space Separated
Cases: 2947

Variables: 561
Record Length: Space Separated
Records Per Case: 1

Part 2: Observations on Y Axis TEST
File Structure: Space Separated
Cases: 2947
Variables: 1
Record Length: 2947
Records Per Case: 1

Part 4: Observations on X Axis Train
File Structure: Space Separated
Cases: 7352
Variables: 561
Record Length: 7352
Records Per Case: 1

Part 5: Observations on Y Axis Train
File Structure: Space Separated
Cases: 7352
Variables: 1
Record Length: 7352
Records Per Case: 1

Part 6: Training Subject
File Structure: Space Separated
Cases: 7352
Variables: 1
Record Length: 7352
Records Per Case: 1

Part 7: Test Subject
File Structure: Space Separated
Cases: 2947
Variables: 1
Record Length: 2947
Records Per Case: 1

Part 8: Features
File Structure: Space Separated
Cases: 561

Variables: 2
Record Length: 561
Records Per Case: 2

Part 9: Features Info
File Structure: Descriptive file with description of all the features in Features

Part 10: Activity Labels
File Structure: Space Separated
Cases: 6
Variables: 2
Record Length: 6
Records Per Case: 2

CODEBOOK OF TRAINING OBSERVATIONS (X-AXIS)

Each row is an observation of a subject for given activity carried in TESTING phase; it provides variables as Features described in FEATURES set.

CODEBOOK OF TRAINING ACTIVITIES (Y-AXIS)

Activity Observed during the training of 30 subjects and these activities are one of the defined activities in the ACTIVITY LABELS set.

CODEBOOK OF TESTING OBSERVATIONS (X-AXIS)

Each row is an observation of a subject for given activity carried in TESTING phase; it provides variables as Features described in FEATURES set.

CODEBOOK OF TESTING ACTIVITIES (Y-AXIS)

Activity Observed during the testing of 30 subjects and these activities are one of the defined activities in the ACTIVITY LABELS set.

CODEBOOK OF TEST SUBJECTS

Unique subjects – 30
Total testing observations - 2947

The Test Subjects are the one who performed the testing activities. This file shows test subject doing multiple activities that matches to activities (Y Axis) and to their corresponding observations (X Axis)

CODEBOOK OF TRAINING SUBJECTS

Unique subjects – 30,
Total training observations - 7352

The Test Subjects are the one who performed the testing activities. This file shows test subject doing multiple activities that matches to activities (Y Axis) and to their corresponding observations (X Axis)

CODEBOOK OF FEATURES

The features selected come from the readings taken from accelerometer and 3-axial gyroscope. In following table, the prefix 't' denotes the time at a constant rate of 50 Hz. The acceleration signal was then separated into body and gravity acceleration signals (tBodyAcc-XYZ and tGravityAcc-XYZ). Jerk signals (tBodyAccJerk-XYZ and tBodyGyroJerk-XYZ) were obtained from the derivation of body linear acceleration and angular velocity.

Feature Index, Feature Name

1 tBodyAcc-mean()-X
2 tBodyAcc-mean()-Y
3 tBodyAcc-mean()-Z
4 tBodyAcc-std()-X
5 tBodyAcc-std()-Y
6 tBodyAcc-std()-Z
7 tBodyAcc-mad()-X
8 tBodyAcc-mad()-Y
9 tBodyAcc-mad()-Z
10 tBodyAcc-max()-X
11 tBodyAcc-max()-Y
12 tBodyAcc-max()-Z
13 tBodyAcc-min()-X
14 tBodyAcc-min()-Y
15 tBodyAcc-min()-Z
16 tBodyAcc-sma()
17 tBodyAcc-energy()-X
18 tBodyAcc-energy()-Y
19 tBodyAcc-energy()-Z

20 tBodyAcc-iqr()-X
21 tBodyAcc-iqr()-Y
22 tBodyAcc-iqr()-Z
23 tBodyAcc-entropy()-X
24 tBodyAcc-entropy()-Y
25 tBodyAcc-entropy()-Z
26 tBodyAcc-arCoeff()-X,1
27 tBodyAcc-arCoeff()-X,2
28 tBodyAcc-arCoeff()-X,3
29 tBodyAcc-arCoeff()-X,4
30 tBodyAcc-arCoeff()-Y,1
31 tBodyAcc-arCoeff()-Y,2
32 tBodyAcc-arCoeff()-Y,3
33 tBodyAcc-arCoeff()-Y,4
34 tBodyAcc-arCoeff()-Z,1
35 tBodyAcc-arCoeff()-Z,2
36 tBodyAcc-arCoeff()-Z,3
37 tBodyAcc-arCoeff()-Z,4
38 tBodyAcc-correlation()-X,Y
39 tBodyAcc-correlation()-X,Z
40 tBodyAcc-correlation()-Y,Z
41 tGravityAcc-mean()-X
42 tGravityAcc-mean()-Y
43 tGravityAcc-mean()-Z
44 tGravityAcc-std()-X
45 tGravityAcc-std()-Y
46 tGravityAcc-std()-Z
47 tGravityAcc-mad()-X
48 tGravityAcc-mad()-Y
49 tGravityAcc-mad()-Z
50 tGravityAcc-max()-X
51 tGravityAcc-max()-Y
52 tGravityAcc-max()-Z
53 tGravityAcc-min()-X
54 tGravityAcc-min()-Y
55 tGravityAcc-min()-Z
56 tGravityAcc-sma()
57 tGravityAcc-energy()-X
58 tGravityAcc-energy()-Y
59 tGravityAcc-energy()-Z
60 tGravityAcc-iqr()-X
61 tGravityAcc-iqr()-Y
62 tGravityAcc-iqr()-Z
63 tGravityAcc-entropy()-X
64 tGravityAcc-entropy()-Y
65 tGravityAcc-entropy()-Z

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67 tGravityAcc-arCoeff()-X,2
68 tGravityAcc-arCoeff()-X,3
69 tGravityAcc-arCoeff()-X,4
70 tGravityAcc-arCoeff()-Y,1
71 tGravityAcc-arCoeff()-Y,2
72 tGravityAcc-arCoeff()-Y,3
73 tGravityAcc-arCoeff()-Y,4
74 tGravityAcc-arCoeff()-Z,1
75 tGravityAcc-arCoeff()-Z,2
76 tGravityAcc-arCoeff()-Z,3
77 tGravityAcc-arCoeff()-Z,4
78 tGravityAcc-correlation()-X,Y
79 tGravityAcc-correlation()-X,Z
80 tGravityAcc-correlation()-Y,Z
81 tBodyAccJerk-mean()-X
82 tBodyAccJerk-mean()-Y
83 tBodyAccJerk-mean()-Z
84 tBodyAccJerk-std()-X
85 tBodyAccJerk-std()-Y
86 tBodyAccJerk-std()-Z
87 tBodyAccJerk-mad()-X
88 tBodyAccJerk-mad()-Y
89 tBodyAccJerk-mad()-Z
90 tBodyAccJerk-max()-X
91 tBodyAccJerk-max()-Y
92 tBodyAccJerk-max()-Z
93 tBodyAccJerk-min()-X
94 tBodyAccJerk-min()-Y
95 tBodyAccJerk-min()-Z
96 tBodyAccJerk-sma()
97 tBodyAccJerk-energy()-X
98 tBodyAccJerk-energy()-Y
99 tBodyAccJerk-energy()-Z
100 tBodyAccJerk-iqr()-X
101 tBodyAccJerk-iqr()-Y
102 tBodyAccJerk-iqr()-Z
103 tBodyAccJerk-entropy()-X
104 tBodyAccJerk-entropy()-Y
105 tBodyAccJerk-entropy()-Z
106 tBodyAccJerk-arCoeff()-X,1
107 tBodyAccJerk-arCoeff()-X,2
108 tBodyAccJerk-arCoeff()-X,3
109 tBodyAccJerk-arCoeff()-X,4
110 tBodyAccJerk-arCoeff()-Y,1
111 tBodyAccJerk-arCoeff()-Y,2

112 tBodyAccJerk-arCoeff()-Y,3
113 tBodyAccJerk-arCoeff()-Y,4
114 tBodyAccJerk-arCoeff()-Z,1
115 tBodyAccJerk-arCoeff()-Z,2
116 tBodyAccJerk-arCoeff()-Z,3
117 tBodyAccJerk-arCoeff()-Z,4
118 tBodyAccJerk-correlation()-X,Y
119 tBodyAccJerk-correlation()-X,Z
120 tBodyAccJerk-correlation()-Y,Z
121 tBodyGyro-mean()-X
122 tBodyGyro-mean()-Y
123 tBodyGyro-mean()-Z
124 tBodyGyro-std()-X
125 tBodyGyro-std()-Y
126 tBodyGyro-std()-Z
127 tBodyGyro-mad()-X
128 tBodyGyro-mad()-Y
129 tBodyGyro-mad()-Z
130 tBodyGyro-max()-X
131 tBodyGyro-max()-Y
132 tBodyGyro-max()-Z
133 tBodyGyro-min()-X
134 tBodyGyro-min()-Y
135 tBodyGyro-min()-Z
136 tBodyGyro-sma()
137 tBodyGyro-energy()-X
138 tBodyGyro-energy()-Y
139 tBodyGyro-energy()-Z
140 tBodyGyro-iqr()-X
141 tBodyGyro-iqr()-Y
142 tBodyGyro-iqr()-Z
143 tBodyGyro-entropy()-X
144 tBodyGyro-entropy()-Y
145 tBodyGyro-entropy()-Z
146 tBodyGyro-arCoeff()-X,1
147 tBodyGyro-arCoeff()-X,2
148 tBodyGyro-arCoeff()-X,3
149 tBodyGyro-arCoeff()-X,4
150 tBodyGyro-arCoeff()-Y,1
151 tBodyGyro-arCoeff()-Y,2
152 tBodyGyro-arCoeff()-Y,3
153 tBodyGyro-arCoeff()-Y,4
154 tBodyGyro-arCoeff()-Z,1
155 tBodyGyro-arCoeff()-Z,2
156 tBodyGyro-arCoeff()-Z,3
157 tBodyGyro-arCoeff()-Z,4

158 tBodyGyro-correlation()-X,Y
159 tBodyGyro-correlation()-X,Z
160 tBodyGyro-correlation()-Y,Z
161 tBodyGyroJerk-mean()-X
162 tBodyGyroJerk-mean()-Y
163 tBodyGyroJerk-mean()-Z
164 tBodyGyroJerk-std()-X
165 tBodyGyroJerk-std()-Y
166 tBodyGyroJerk-std()-Z
167 tBodyGyroJerk-mad()-X
168 tBodyGyroJerk-mad()-Y
169 tBodyGyroJerk-mad()-Z
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171 tBodyGyroJerk-max()-Y
172 tBodyGyroJerk-max()-Z
173 tBodyGyroJerk-min()-X
174 tBodyGyroJerk-min()-Y
175 tBodyGyroJerk-min()-Z
176 tBodyGyroJerk-sma()
177 tBodyGyroJerk-energy()-X
178 tBodyGyroJerk-energy()-Y
179 tBodyGyroJerk-energy()-Z
180 tBodyGyroJerk-iqr()-X
181 tBodyGyroJerk-iqr()-Y
182 tBodyGyroJerk-iqr()-Z
183 tBodyGyroJerk-entropy()-X
184 tBodyGyroJerk-entropy()-Y
185 tBodyGyroJerk-entropy()-Z
186 tBodyGyroJerk-arCoeff()-X,1
187 tBodyGyroJerk-arCoeff()-X,2
188 tBodyGyroJerk-arCoeff()-X,3
189 tBodyGyroJerk-arCoeff()-X,4
190 tBodyGyroJerk-arCoeff()-Y,1
191 tBodyGyroJerk-arCoeff()-Y,2
192 tBodyGyroJerk-arCoeff()-Y,3
193 tBodyGyroJerk-arCoeff()-Y,4
194 tBodyGyroJerk-arCoeff()-Z,1
195 tBodyGyroJerk-arCoeff()-Z,2
196 tBodyGyroJerk-arCoeff()-Z,3
197 tBodyGyroJerk-arCoeff()-Z,4
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199 tBodyGyroJerk-correlation()-X,Z
200 tBodyGyroJerk-correlation()-Y,Z
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202 tBodyAccMag-std()
203 tBodyAccMag-mad()

204 tBodyAccMag-max()
205 tBodyAccMag-min()
206 tBodyAccMag-sma()
207 tBodyAccMag-energy()
208 tBodyAccMag-iqr()
209 tBodyAccMag-entropy()
210 tBodyAccMag-arCoeff()1
211 tBodyAccMag-arCoeff()2
212 tBodyAccMag-arCoeff()3
213 tBodyAccMag-arCoeff()4
214 tGravityAccMag-mean()
215 tGravityAccMag-std()
216 tGravityAccMag-mad()
217 tGravityAccMag-max()
218 tGravityAccMag-min()
219 tGravityAccMag-sma()
220 tGravityAccMag-energy()
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222 tGravityAccMag-entropy()
223 tGravityAccMag-arCoeff()1
224 tGravityAccMag-arCoeff()2
225 tGravityAccMag-arCoeff()3
226 tGravityAccMag-arCoeff()4
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228 tBodyAccJerkMag-std()
229 tBodyAccJerkMag-mad()
230 tBodyAccJerkMag-max()
231 tBodyAccJerkMag-min()
232 tBodyAccJerkMag-sma()
233 tBodyAccJerkMag-energy()
234 tBodyAccJerkMag-iqr()
235 tBodyAccJerkMag-entropy()
236 tBodyAccJerkMag-arCoeff()1
237 tBodyAccJerkMag-arCoeff()2
238 tBodyAccJerkMag-arCoeff()3
239 tBodyAccJerkMag-arCoeff()4
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241 tBodyGyroMag-std()
242 tBodyGyroMag-mad()
243 tBodyGyroMag-max()
244 tBodyGyroMag-min()
245 tBodyGyroMag-sma()
246 tBodyGyroMag-energy()
247 tBodyGyroMag-iqr()
248 tBodyGyroMag-entropy()
249 tBodyGyroMag-arCoeff()1

250 tBodyGyroMag-arCoeff()2
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252 tBodyGyroMag-arCoeff()4
253 tBodyGyroJerkMag-mean()
254 tBodyGyroJerkMag-std()
255 tBodyGyroJerkMag-mad()
256 tBodyGyroJerkMag-max()
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259 tBodyGyroJerkMag-energy()
260 tBodyGyroJerkMag-iqr()
261 tBodyGyroJerkMag-entropy()
262 tBodyGyroJerkMag-arCoeff()1
263 tBodyGyroJerkMag-arCoeff()2
264 tBodyGyroJerkMag-arCoeff()3
265 tBodyGyroJerkMag-arCoeff()4
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267 fBodyAcc-mean()-Y
268 fBodyAcc-mean()-Z
269 fBodyAcc-std()-X
270 fBodyAcc-std()-Y
271 fBodyAcc-std()-Z
272 fBodyAcc-mad()-X
273 fBodyAcc-mad()-Y
274 fBodyAcc-mad()-Z
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276 fBodyAcc-max()-Y
277 fBodyAcc-max()-Z
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279 fBodyAcc-min()-Y
280 fBodyAcc-min()-Z
281 fBodyAcc-sma()
282 fBodyAcc-energy()-X
283 fBodyAcc-energy()-Y
284 fBodyAcc-energy()-Z
285 fBodyAcc-iqr()-X
286 fBodyAcc-iqr()-Y
287 fBodyAcc-iqr()-Z
288 fBodyAcc-entropy()-X
289 fBodyAcc-entropy()-Y
290 fBodyAcc-entropy()-Z
291 fBodyAcc-maxInds-X
292 fBodyAcc-maxInds-Y
293 fBodyAcc-maxInds-Z
294 fBodyAcc-meanFreq()-X
295 fBodyAcc-meanFreq()-Y

296 fBodyAcc-meanFreq()-Z
297 fBodyAcc-skewness()-X
298 fBodyAcc-kurtosis()-X
299 fBodyAcc-skewness()-Y
300 fBodyAcc-kurtosis()-Y
301 fBodyAcc-skewness()-Z
302 fBodyAcc-kurtosis()-Z
303 fBodyAcc-bandsEnergy()-1,8
304 fBodyAcc-bandsEnergy()-9,16
305 fBodyAcc-bandsEnergy()-17,24
306 fBodyAcc-bandsEnergy()-25,32
307 fBodyAcc-bandsEnergy()-33,40
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346 fBodyAccJerk-mean()-Y
347 fBodyAccJerk-mean()-Z
348 fBodyAccJerk-std()-X
349 fBodyAccJerk-std()-Y
350 fBodyAccJerk-std()-Z
351 fBodyAccJerk-mad()-X
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353 fBodyAccJerk-mad()-Z
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356 fBodyAccJerk-max()-Z
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359 fBodyAccJerk-min()-Z
360 fBodyAccJerk-sma()
361 fBodyAccJerk-energy()-X
362 fBodyAccJerk-energy()-Y
363 fBodyAccJerk-energy()-Z
364 fBodyAccJerk-iqr()-X
365 fBodyAccJerk-iqr()-Y
366 fBodyAccJerk-iqr()-Z
367 fBodyAccJerk-entropy()-X
368 fBodyAccJerk-entropy()-Y
369 fBodyAccJerk-entropy()-Z
370 fBodyAccJerk-maxInds-X
371 fBodyAccJerk-maxInds-Y
372 fBodyAccJerk-maxInds-Z
373 fBodyAccJerk-meanFreq()-X
374 fBodyAccJerk-meanFreq()-Y
375 fBodyAccJerk-meanFreq()-Z
376 fBodyAccJerk-skewness()-X
377 fBodyAccJerk-kurtosis()-X
378 fBodyAccJerk-skewness()-Y
379 fBodyAccJerk-kurtosis()-Y
380 fBodyAccJerk-skewness()-Z
381 fBodyAccJerk-kurtosis()-Z
382 fBodyAccJerk-bandsEnergy()-1,8
383 fBodyAccJerk-bandsEnergy()-9,16
384 fBodyAccJerk-bandsEnergy()-17,24
385 fBodyAccJerk-bandsEnergy()-25,32
386 fBodyAccJerk-bandsEnergy()-33,40
387 fBodyAccJerk-bandsEnergy()-41,48

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394 fBodyAccJerk-bandsEnergy()-1,24
395 fBodyAccJerk-bandsEnergy()-25,48
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407 fBodyAccJerk-bandsEnergy()-49,64
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409 fBodyAccJerk-bandsEnergy()-25,48
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426 fBodyGyro-mean()-Z
427 fBodyGyro-std()-X
428 fBodyGyro-std()-Y
429 fBodyGyro-std()-Z
430 fBodyGyro-mad()-X
431 fBodyGyro-mad()-Y
432 fBodyGyro-mad()-Z
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434 fBodyGyro-max()-Y
435 fBodyGyro-max()-Z
436 fBodyGyro-min()-X
437 fBodyGyro-min()-Y
438 fBodyGyro-min()-Z
439 fBodyGyro-sma()
440 fBodyGyro-energy()-X
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442 fBodyGyro-energy()-Z
443 fBodyGyro-iqr()-X
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445 fBodyGyro-iqr()-Z
446 fBodyGyro-entropy()-X
447 fBodyGyro-entropy()-Y
448 fBodyGyro-entropy()-Z
449 fBodyGyro-maxInds-X
450 fBodyGyro-maxInds-Y
451 fBodyGyro-maxInds-Z
452 fBodyGyro-meanFreq()-X
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454 fBodyGyro-meanFreq()-Z
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456 fBodyGyro-kurtosis()-X
457 fBodyGyro-skewness()-Y
458 fBodyGyro-kurtosis()-Y
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476 fBodyGyro-bandsEnergy()-9,16
477 fBodyGyro-bandsEnergy()-17,24
478 fBodyGyro-bandsEnergy()-25,32
479 fBodyGyro-bandsEnergy()-33,40

480 fBodyGyro-bandsEnergy()-41,48
481 fBodyGyro-bandsEnergy()-49,56
482 fBodyGyro-bandsEnergy()-57,64
483 fBodyGyro-bandsEnergy()-1,16
484 fBodyGyro-bandsEnergy()-17,32
485 fBodyGyro-bandsEnergy()-33,48
486 fBodyGyro-bandsEnergy()-49,64
487 fBodyGyro-bandsEnergy()-1,24
488 fBodyGyro-bandsEnergy()-25,48
489 fBodyGyro-bandsEnergy()-1,8
490 fBodyGyro-bandsEnergy()-9,16
491 fBodyGyro-bandsEnergy()-17,24
492 fBodyGyro-bandsEnergy()-25,32
493 fBodyGyro-bandsEnergy()-33,40
494 fBodyGyro-bandsEnergy()-41,48
495 fBodyGyro-bandsEnergy()-49,56
496 fBodyGyro-bandsEnergy()-57,64
497 fBodyGyro-bandsEnergy()-1,16
498 fBodyGyro-bandsEnergy()-17,32
499 fBodyGyro-bandsEnergy()-33,48
500 fBodyGyro-bandsEnergy()-49,64
501 fBodyGyro-bandsEnergy()-1,24
502 fBodyGyro-bandsEnergy()-25,48
503 fBodyAccMag-mean()
504 fBodyAccMag-std()
505 fBodyAccMag-mad()
506 fBodyAccMag-max()
507 fBodyAccMag-min()
508 fBodyAccMag-sma()
509 fBodyAccMag-energy()
510 fBodyAccMag-iqr()
511 fBodyAccMag-entropy()
512 fBodyAccMag-maxInds
513 fBodyAccMag-meanFreq()
514 fBodyAccMag-skewness()
515 fBodyAccMag-kurtosis()
516 fBodyBodyAccJerkMag-mean()
517 fBodyBodyAccJerkMag-std()
518 fBodyBodyAccJerkMag-mad()
519 fBodyBodyAccJerkMag-max()
520 fBodyBodyAccJerkMag-min()
521 fBodyBodyAccJerkMag-sma()
522 fBodyBodyAccJerkMag-energy()
523 fBodyBodyAccJerkMag-iqr()
524 fBodyBodyAccJerkMag-entropy()
525 fBodyBodyAccJerkMag-maxInds

526 fBodyBodyAccJerkMag-meanFreq()
527 fBodyBodyAccJerkMag-skewness()
528 fBodyBodyAccJerkMag-kurtosis()
529 fBodyBodyGyroMag-mean()
530 fBodyBodyGyroMag-std()
531 fBodyBodyGyroMag-mad()
532 fBodyBodyGyroMag-max()
533 fBodyBodyGyroMag-min()
534 fBodyBodyGyroMag-sma()
535 fBodyBodyGyroMag-energy()
536 fBodyBodyGyroMag-iqr()
537 fBodyBodyGyroMag-entropy()
538 fBodyBodyGyroMag-maxInds
539 fBodyBodyGyroMag-meanFreq()
540 fBodyBodyGyroMag-skewness()
541 fBodyBodyGyroMag-kurtosis()
542 fBodyBodyGyroJerkMag-mean()
543 fBodyBodyGyroJerkMag-std()
544 fBodyBodyGyroJerkMag-mad()
545 fBodyBodyGyroJerkMag-max()
546 fBodyBodyGyroJerkMag-min()
547 fBodyBodyGyroJerkMag-sma()
548 fBodyBodyGyroJerkMag-energy()
549 fBodyBodyGyroJerkMag-iqr()
550 fBodyBodyGyroJerkMag-entropy()
551 fBodyBodyGyroJerkMag-maxInds
552 fBodyBodyGyroJerkMag-meanFreq()
553 fBodyBodyGyroJerkMag-skewness()
554 fBodyBodyGyroJerkMag-kurtosis()
555 angle(tBodyAccMean,gravity)
556 angle(tBodyAccJerkMean),gravityMean)
557 angle(tBodyGyroMean,gravityMean)
558 angle(tBodyGyroJerkMean,gravityMean)
559 angle(X,gravityMean)
560 angle(Y,gravityMean)
561 angle(Z,gravityMean)

The set of variables that were estimated from these signals are:

mean(): Mean value
std(): Standard deviation
mad(): Median absolute deviation
max(): Largest value in array
min(): Smallest value in array
sma(): Signal magnitude area

energy(): Energy measure. Sum of the squares divided by the number of values.
iqr(): Interquartile range
entropy(): Signal entropy
arCoeff(): Auto-regression coefficients with Burg order equal to 4
correlation(): correlation coefficient between two signals
maxInds(): index of the frequency component with largest magnitude
meanFreq(): Weighted average of the frequency components to obtain a mean frequency
skewness(): skewness of the frequency domain signal
kurtosis(): kurtosis of the frequency domain signal
bandsEnergy(): Energy of a frequency interval within the 64 bins of the FFT of each window.
angle(): Angle between to vectors.

CODEBOOK OF ACTIVITY LABLES

These are the unique 6 activities performed by 30 subjects, their activity observations are recorded in the Y-Axis files for TESTING and TRAINING.

1 WALKING
2 WALKING_UPSTAIRS
3 WALKING_DOWNSTAIRS
4 SITTING
5 STANDING
6 LAYING