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Human Activity Recognition Using Smartphones Dataset
Version 1.0

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Experiment Overview

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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 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.

The main dataset 'MergedUCISamsungGal2Data.txt' contains:
- An activity label.
- An identifier of the subject who carried out the experiment.
- 66-feature vector with the mean and standard deviation (std) of slected time and frequency domain variables.

A summarised version of the dataset obtained by averaging each variable for each activity and each subject is provided in 'TidyUCISamsungGal2Data.txt'

The full list of variable names in each dataset is shown below:

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SubjectID
Activity
timeDomain.BodyAccelerometer.mean.X
timeDomain.BodyAccelerometer.mean.Y
timeDomain.BodyAccelerometer.mean.Z
timeDomain.BodyAccelerometer.std.X
timeDomain.BodyAccelerometer.std.Y

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timeDomain.BodyAccelerometer.std.Z
timeDomain.GravityAccelerometer.mean.X
timeDomain.GravityAccelerometer.mean.Y
timeDomain.GravityAccelerometer.mean.Z
timeDomain.GravityAccelerometer.std.X
timeDomain.GravityAccelerometer.std.Y
timeDomain.GravityAccelerometer.std.Z
timeDomain.BodyAccelerometerJerk.mean.X
timeDomain.BodyAccelerometerJerk.mean.Y
timeDomain.BodyAccelerometerJerk.mean.Z
timeDomain.BodyAccelerometerJerk.std.X
timeDomain.BodyAccelerometerJerk.std.Y
timeDomain.BodyAccelerometerJerk.std.Z
timeDomain.BodyGyroscope.mean.X
timeDomain.BodyGyroscope.mean.Y
timeDomain.BodyGyroscope.mean.Z
timeDomain.BodyGyroscope.std.X
timeDomain.BodyGyroscope.std.Y
timeDomain.BodyGyroscope.std.Z
timeDomain.BodyGyroscopeJerk.mean.X
timeDomain.BodyGyroscopeJerk.mean.Y
timeDomain.BodyGyroscopeJerk.mean.Z
timeDomain.BodyGyroscopeJerk.std.X
timeDomain.BodyGyroscopeJerk.std.Y
timeDomain.BodyGyroscopeJerk.std.Z
timeDomain.BodyAccelerometerMag.mean
timeDomain.BodyAccelerometerMag.std
timeDomain.GravityAccelerometerMag.mean
timeDomain.GravityAccelerometerMag.std
timeDomain.BodyAccelerometerJerkMag.mean
timeDomain.BodyAccelerometerJerkMag.std
timeDomain.BodyGyroscopeMag.mean
timeDomain.BodyGyroscopeMag.std
timeDomain.BodyGyroscopeJerkMag.mean
timeDomain.BodyGyroscopeJerkMag.std
freqDomain.BodyAccelerometer.mean.X
freqDomain.BodyAccelerometer.mean.Y
freqDomain.BodyAccelerometer.mean.Z
freqDomain.BodyAccelerometer.std.X
freqDomain.BodyAccelerometer.std.Y
freqDomain.BodyAccelerometer.std.Z
freqDomain.BodyAccelerometerJerk.mean.X
freqDomain.BodyAccelerometerJerk.mean.Y
freqDomain.BodyAccelerometerJerk.mean.Z
freqDomain.BodyAccelerometerJerk.std.X
freqDomain.BodyAccelerometerJerk.std.Y
freqDomain.BodyAccelerometerJerk.std.Z
freqDomain.BodyGyroscope.mean.X
freqDomain.BodyGyroscope.mean.Y
freqDomain.BodyGyroscope.mean.Z
freqDomain.BodyGyroscope.std.X
freqDomain.BodyGyroscope.std.Y
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freqDomain.BodyGyroscope.std.Z
freqDomain.BodyAccelerometerMag.mean
freqDomain.BodyAccelerometerMag.std
freqDomain.BodyBodyAccelerometerJerkMag.mean
freqDomain.BodyBodyAccelerometerJerkMag.std
freqDomain.BodyBodyGyroscopeMag.mean
freqDomain.BodyBodyGyroscopeMag.std
freqDomain.BodyBodyGyroscopeJerkMag.mean
freqDomain.BodyBodyGyroscopeJerkMag.std

Notes:
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- Features are normalized and bounded within [-1,1].
- Each feature vector is a row on the text file.

For more information about this dataset contact:
activityrecognition@smartlab.ws

License:
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Use of this dataset in publications must be acknowledged by referencing the following publication [1]

[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

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