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Human Activity Recognition Using Smartphones Data Set

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Abstract: 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 Set Characteristics:	Multivariate, Time-Series	Number of Instances:	10299	Area:	Computer
Attribute Characteristics:	N/A	Number of Attributes:	561	Date Donated	2012-12-10
Associated Tasks:	Classification, Clustering	Missing Values?	N/A	Number of Web Hits:	94946

Source:

Jorge L. Reyes-Ortiz, Davide Anguita, Alessandro Ghio, Luca Oneto.
 Smartlab - Non Linear Complex Systems Laboratory
 DITEN - Università degli Studi di Genova, Genoa I-16145, Italy.
activityrecognition '@' smartlab.ws
www.smartlab.ws

Data Set Information:

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.

Check the README.txt file for further details about this dataset.

Attribute Information:

For each record in the dataset 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.

Citation Request:

[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

Operations Completed for *Getting and Cleaning Data* Course Project:

1. Corresponding Training and Testing datasets were merged
2. All dataset fields except those pertaining to mean and standard deviation measurements were discarded.
3. Dataset column names were updated to more “tidy” values
4. Activity names were updated to more “tidy” values
5. A second “tidy” dataset was created using the average of each original value, grouped by each subject and activity.
6. All units used in the original dataset are carried over into the derivative dataset.