Code Book

Human Activity Recognition Using Smartphones Dataset

subject

Subject

who performed the activity for each window sample.

1..30 integer

Summary:

subject

Min. : 1.0

1st Qu.: 8.0

Median :15.5

Mean :15.5

3rd Qu.:23.0

Max. :30.0

activities

Activities

WALKING

WALKING\_UPSTAIRS

WALKING\_DOWNSTAIRS

SITTING

STANDING

LAYING

Summary:

activities

LAYING :960

SITTING :960

STANDING :960

WALKING :960

WALKING\_DOWNSTAIRS:960

WALKING\_UPSTAIRS :960

signals

Signals

These signals were used to estimate variables of the feature vector for each pattern:

tBodyAcc\_X

tBodyAcc\_Y

tBodyAcc\_Z

tGravityAcc\_X

tGravityAcc\_Y

tGravityAcc\_Z

tBodyAccJerk\_X

tBodyAccJerk\_Y

tBodyAccJerk\_Z

tBodyGyro\_X

tBodyGyro\_Y

tBodyGyro\_Z

tBodyGyroJerk\_X

tBodyGyroJerk\_Y

tBodyGyroJerk\_Z

tBodyAccMag

tBodyAccJerkMag

tBodyGyroMag

tBodyGyroJerkMag

fBodyAcc\_X

fBodyAcc\_Y

fBodyAcc\_Z

fBodyAccJerk\_X

fBodyAccJerk\_Y

fBodyAccJerk\_Z

fBodyGyro\_X

fBodyGyro\_Y

fBodyGyro\_Z

fBodyAccMag

fBodyBodyAccJerkMag

fBodyBodyGyroMag

fBodyBodyGyroJerkMag

Summary:

signals

tBodyAcc\_X : 180

tBodyAcc\_Y : 180

tBodyAcc\_Z : 180

tGravityAcc\_X: 180

tGravityAcc\_Y: 180

tGravityAcc\_Z: 180

(Other) :4680

mean

Mean value

normalized and bounded within [-1,1]

-0.99762 ..0.97451 double

Summary:

mean

Min. :-0.99762

1st Qu.:-0.92548

Median :-0.12395

Mean :-0.30309

3rd Qu.:-0.01147

Max. : 0.97451

std

Standard deviation

normalized and bounded within [-1,1]

-0.98881.. 0.09231 double

Summary:

std

Min. :-0.98881

1st Qu.:-0.96731

Median :-0.72873

Mean :-0.66337

3rd Qu.:-0.36848

Max. : 0.09231

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.