

## CODE BOOK

# Human Activity Recognition [HAR] Data by Subject and Activity

---

## Data Overview

Measurements of the mean and standard deviation of 33 different types of body movements were collected using a smartphone from a set of 30 volunteer subjects, each performing six types of activities. In total, each of the 66 movement measures (33 mean measures and 33 standard deviation measures) had over 10,000 data observations. These data were normalized on a -1 to 1 scale for each of the 66 measures. The measurements for each subject for each type of activities then were averaged to create 66 movement measures for 180 subject/activity combination. As a result, the dataset is a 180 x 68 matrix. (In addition to the 66 movement measures there is a variable for subject ID and a variable for the activity being performed during measurement.)

## Variable Name Format

The names of each of the 66 movement measures follow a similar structure:

- the first four characters indicate whether the measure is a mean (“Mean”) or standard deviation (“StDv”)
- the fifth character is an underscore (“\_”)
- the sixth letter indicates whether the variable measures time (t) or frequency (f) of physical movements
- the next cluster indicates the body movement being measured
- if a measurement is along a particular axis, the variable name will end with a “X”, “Y” or “Z” to indicate the axis

## Variable Descriptions

### SubjID

*Identification code for each volunteer subject*

Type = Integer

### Activity

*Physical action being performed when measures were taken*

Type = Factor

Levels: “WALKING”; “WALKING UPSTAIRS”; “WALKING DOWNSTAIRS”; “SITTING”; “STANDING”; “LAYING”

### CLUSTER 1 (12 VARIABLES)

Mean\_tBodyAcc\_X, Mean\_tBodyAcc\_Y, Mean\_tBodyAcc\_Z

StDv\_tBodyAcc\_X, StDv\_tBodyAcc\_Y, StDv\_tBodyAcc\_Z

Mean\_fBodyAcc\_X, Mean\_fBodyAcc\_Y, Mean\_fBodyAcc\_Z

StDv\_fBodyAcc\_X, StDv\_fBodyAcc\_Y, StDv\_fBodyAcc\_Z

*Time and frequency measures of body motion component of linear acceleration along the X, Y, and Z axes, as collected by the smartphone's accelerometer*

Type = Number

### CLUSTER 2 (12 VARIABLES)

Mean\_tBodyAccJerk\_X, Mean\_tBodyAccJerk\_Y, Mean\_tBodyAccJerk\_Z

StDv\_tBodyAccJerk\_X, StDv\_tBodyAccJerk\_Y, StDv\_tBodyAccJerk\_Z

Mean\_fBodyAccJerk\_X, Mean\_fBodyAccJerk\_Y, Mean\_fBodyAccJerk\_Z

StDv\_fBodyAccJerk\_X, StDv\_fBodyAccJerk\_Y, StDv\_fBodyAccJerk\_Z

*Time and frequency measures of body jerk signals along the X, Y, and Z axes derived from the body motion acceleration data collected by the smartphone's accelerometer*

Type = Number

### CLUSTER 3 (6 VARIABLES)

Mean\_tGravityAcc\_X, Mean\_tGravityAcc\_Y, Mean\_tGravityAcc\_Z

StDv\_tGravityAcc\_X, StDv\_tGravityAcc\_Y, StDv\_tGravityAcc\_Z

*Time measures of gravitational component of linear acceleration along the X, Y, and Z axes, as collected by the smartphone's accelerometer*

Type = Number

#### CLUSTER 4 (12 VARIABLES)

Mean\_tBodyGyro\_X, Mean\_tBodyGyro\_Y, Mean\_tBodyGyro\_Z

StDv\_tBodyGyro\_X, StDv\_tBodyGyro\_Y, StDv\_tBodyGyro\_Z

Mean\_fBodyGyro\_X, Mean\_fBodyGyro\_Y, Mean\_fBodyGyro\_Z

StDv\_fBodyGyro\_X, StDv\_fBodyGyro\_Y, StDv\_fBodyGyro\_Z

*Time and frequency measures of angular velocity along the X, Y, and Z axes, as collected by the smartphone's gyroscope*

Type = Number

#### CLUSTER 5 (6 VARIABLES)

Mean\_tBodyGyroJerk\_X, Mean\_tBodyGyroJerk\_Y, Mean\_tBodyGyroJerk\_Z

StDv\_tBodyGyroJerk\_X, StDv\_tBodyGyroJerk\_Y, StDv\_tBodyGyroJerk\_Z

*Time measures of body jerk signals along the X, Y, and Z axes derived from the angular velocity data collected by the smartphone's gyroscope*

Type = Number

#### CLUSTER 6 (10 VARIABLES)

Mean\_tBodyAccMag, Mean\_tBodyAccJerkMag, Mean\_tGravityAccMag,  
Mean\_tBodyGyroMag, Mean\_tBodyGyroJerkMag

StDv\_tBodyAccMag, StDv\_tBodyAccJerkMag, StDv\_tGravityAccMag,  
StDv\_tBodyGyroMag, StDv\_tBodyGyroJerkMag

*Magnitude of three-dimensional signals calculated using the Euclidean norm from the time measures in clusters 1-5*

Type = Number

#### CLUSTER 7 (8 VARIABLES)

Mean\_fBodyAccMag, Mean\_fBodyBodyAccJerkMag,  
Mean\_fBodyBodyGyroMag, Mean\_fBodyBodyGyroJerkMag

StDv\_fBodyAccMag, StDv\_fBodyBodyAccJerkMag, StDv\_fBodyBodyGyroMag,  
StDv\_fBodyBodyGyroJerkMag

*Fast Fourier Transform applied to some of the functional measures in clusters 1-5*

Type = Number