Human Activity Recognition Using Smartphones Data Set - Report

2) Information from README.md

a) Function (Content) of the Dataset

The dataset captures human activity recognition data collected from 30 volunteers aged 19-48 years performing six different activities (WALKING, WALKING_UPSTAIRS, WALKING_DOWNSTAIRS, SITTING, STANDING, LAYING) while wearing a Samsung Galaxy S II smartphone on their waist. The accelerometer and gyroscope embedded in the smartphone were used to capture 3-axial linear acceleration and 3-axial angular velocity at a constant rate of 50Hz. The experiments were video-recorded and manually labeled. The dataset provides processed sensor signals along with derived features for activity recognition tasks.

b) Authors of the Dataset

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c) Structure of Files in the Dataset and Their Meaning

The dataset includes the following files:

1. **README.txt**: Contains general information about the dataset and its structure.
2. **features_info.txt**: Shows information about the variables used on the feature vector.
3. **features.txt**: List of all 561 features (variables).
4. **activity_labels.txt**: Links the class labels (1-6) with their activity name (WALKING, WALKING_UPSTAIRS, WALKING_DOWNSTAIRS, SITTING, STANDING, LAYING).
5. **train/X_train.txt**: Training set containing 561-feature vectors.
6. **train/y_train.txt**: Training labels indicating the activity performed.
7. **test/X_test.txt**: Test set containing 561-feature vectors.
8. **test/y_test.txt**: Test labels indicating the activity performed.
9. **train/subject_train.txt** and **test/subject_test.txt**: Each row identifies the subject who performed the activity for each window sample. Its range is from 1 to 30.
10. **Inertial Signals directory** files:
    - **total_acc_[xyz]_train.txt/test.txt**: The acceleration signal from the smartphone accelerometer in standard gravity units 'g'.
    - **body_acc_[xyz]_train.txt/test.txt**: The body acceleration signal obtained by subtracting gravity from the total acceleration.
    - **body_gyro_[xyz]_train.txt/test.txt**: The angular velocity vector measured by the gyroscope in radians/second.

d) Information Stored in Each Record

Each record in the dataset provides:

1. Triaxial acceleration from the accelerometer (total acceleration) and the estimated body acceleration.
2. Triaxial angular velocity from the gyroscope.
3. A 561-feature vector with time and frequency domain variables.
4. Its activity label (one of six activities).
5. An identifier of the subject who carried out the experiment (ranging from 1 to 30).

The features are normalized and bounded within [-1,1], and each feature vector is represented as a row in the text files.