Project: Human Activity Recognition using Smart Phones

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1 Data source

https://archive.ics.uci.edu/ml/datasets/Human+Activity+Recognition+Using+Smartphones

2 Task description

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 on the waist. Using its embedded accelerometer and gyroscope, the acceleration and angular velocity are measured. The experiments have been video-recorded to label the data manually.

Task: Recognize human activity in base of sensor measurements.

3 Methodology

a) **Feature selection**: The dataset contains a large amount of features. Apply feature selection algorithms available, eg. in WEKA system to remove redundat attributes.

Classification algorithm:
Apply one of the following approaches:

- Multilayer neural network (NN).
- K nearest neighbours.

Implement the classification algorithm.
Tune the parameters to find the optimal configuration (eg. learning rate, number of epocs (NN), number of neighbours k (k-NN)).

4 Model testowania

Test the classifier in terms of *classification accuracy*. Describe in details the experimental process and results. Show observations, remarks and the conclusion.

The data set is available at *Data Source*. Randomly split it in two subsets:

- Training data: 70% of whole data set.
- Testing data: the remaining part.