#### Analytical Project Assignment

Team A

Human activity recognition

## Associated data sets

Dataset-har-PUC-Rio-ugulino.csv

# Data description

Human activity recognition is a growing field with numerous applications. Companies like BodyMedia and Fitbit sell personal activity monitors worn on the left arm and waist, respectively. One can imagine numerous applications for this technology. For the purposes of this project, suppose your company would like to construct a similar device. Toward that end, you have been provided a dataset containing approximately 8 hours of accelerometer data for each of 4 individuals. Records represent 3-axis acceleration measurements taken from 4 accelerometers worn on the waist, left thigh, right arm, and right ankle. Each measurement is taken over a time window of 150ms and presented in temporal order, without a time stamp. The activity of each participant is categorized into 5 classes; sitting, sitting-down, standing, standing-up, and walking. For more information you can visit <http://groupware.les.inf.puc-rio.br/har#ixzz2aUaBROdz>.

### Your tasks

1. Determine whether or not the activity of an individual can be correctly detected from the given accelerometer data.
2. Derive features that exploit the temporal nature of these data. Determine the informativeness of these features and compare with an instantaneous approach (i.e. using only the acceleration measures for the current instant of time).
3. If you are able to reliably detect the current activity, investigate how long it takes to detect a change from one type of activity to another. Try to calculate new features that improve your change-point detection.
4. If only a single accelerometer can be worn, determine which location waist, left thigh, right arm, or right ankle results in the best activity classifier in terms of both classification accuracy and change point detection.
5. Summarize your findings and provide recommendations to your company.