DSP Assignment 3

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Introduction :

The basic task of this assignment is Activity Classification. We have collected data from various people of walking, running, jumping and standing and have built an ML model to classify these activities.

The data was collected using an application called 'SensorRecord' using cell phones which involved the data collected using 2 sensors: **accelerometer** and **gyroscope**.

The data collected involved the values at the interval of 10 milliseconds.

The raw data had in it, timestamp, x, y and z coordinate values of accelerometer and gyroscope data.

Data Processing:

We had obtained data in the form of csv files. Data preprocessing included compiling all the data in a single file and extracting features out of it. We have created labels for different activities : 1 for walking, 2 for running, 3 for jumping and 4 for climbing the stairs.

Along with this in order to extract features from this time-series data, it was divided into windows of 1 second(containing 100 sampled points each) that was regarded as subject.

Finally feature extraction was done based on which we had applied the classification model.

The features that were extracted were : Mean, Max, Min, Mode, Median, Root mean squared value and standard deviation for each of the coordinate values of the accelerometer and gyroscope.

The classification model that was applied was SVM.

Observation:

We divided this data into 80% training and 20% testing data. The accuracy observed on the model ranged from 85% to 96% average of which comes out to be 90.5%.

The code and the datafile has been attached along with the report.