Group 13: Healthy Ageing

Project Idea:

- Evidence shows that regular physical activity is very good for healthy or frail elderly people and fights the risks of developing major cardiovascular and metabolic diseases, obesity, falls, cognitive impairments, osteoporosis and muscular weakness, which are decreased by regularly completing activities.

- We want to create an application (or program) that will monitor an elderly person's daily activities by giving them a summary of their daily activities including sleep time, walking, running, etc. and also their calorie counter at the end of the day.

- This will help people maintain a healthy fitness routine and keep a track of their daily activities.

Sensor(s) and Data Being Used

- For training our model, we are using the Human Activity Recognition Using Smartphones Data Set where walking, walking upstairs, walking downstairs, sitting, standing and lying down are modeled by using a triaxial acceleration sensor and triaxial gyroscope sensor.

- We are using triaxial accelerometer data from the phone to gather data for testing purposes
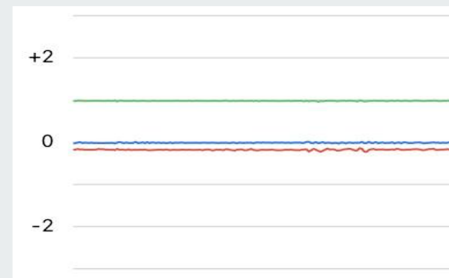
Waveforms for each Activity
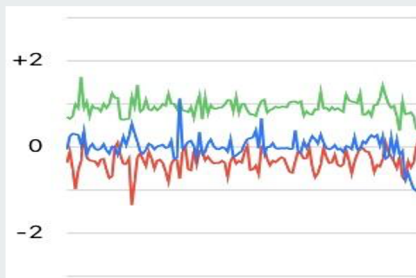
Walking

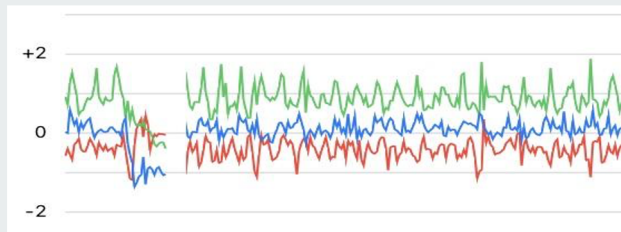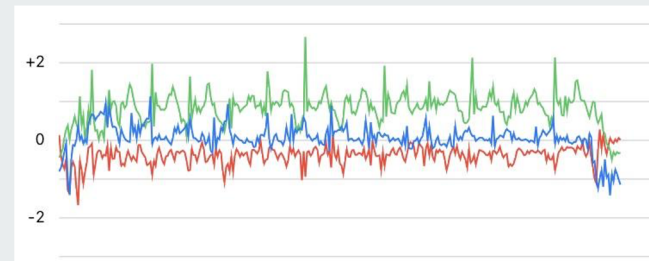Laying Down

Standing

Walking Down

Sitting
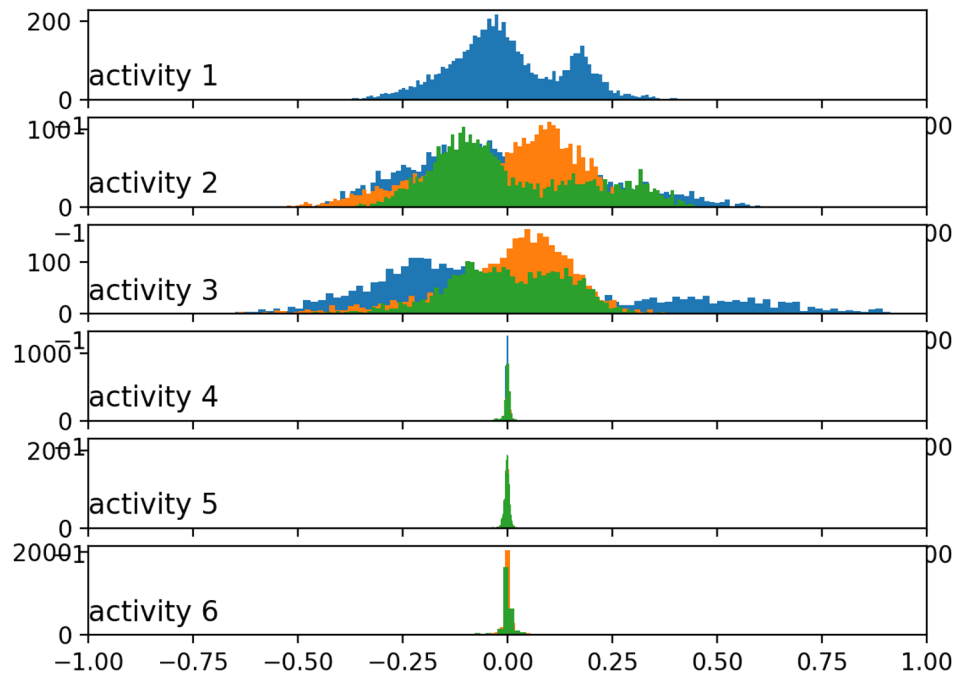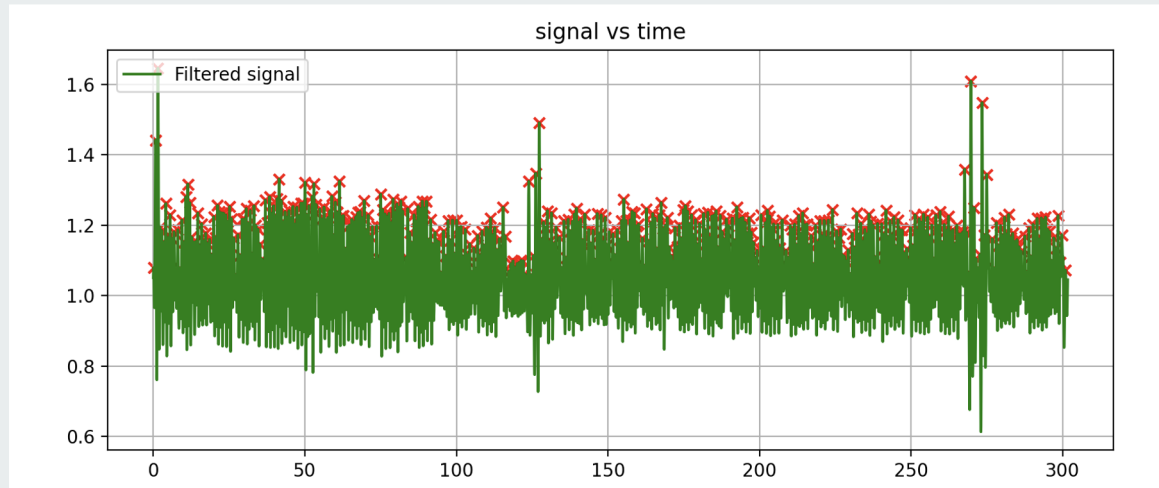

Walking Up

Histogram of body acceleration by activity

Activity 1: Walking
Activity 2: Walking Upstairs
Activity 3: Walking Downstairs
Activity 4: Sitting
Activity 5: Standing
Activity 6: Lying Down

Detected Steps on the Walking Data

- This was done to help in calculating the calorie count

What we have done so far

- We found a dataset which represents physical activities that are not too strenuous for elderly people.
- Visualized the data for each activity using histograms.
- Tested different activities in real-time and interpreted the waveforms received.
- We implemented the step counting algorithm using gradient descent on the current dataset for walking activity.

What we plan to do

- We plan on using different features like mean, median, variance, amax, etc. to build a decision tree model as a baseline for predicting different activities.
- Work on different ML models and do cross validation to compare different models with our baseline and report the best result.
- Implement a pedometer by combining our step counts with an estimation of the calories.