

## Mid Project Review Report

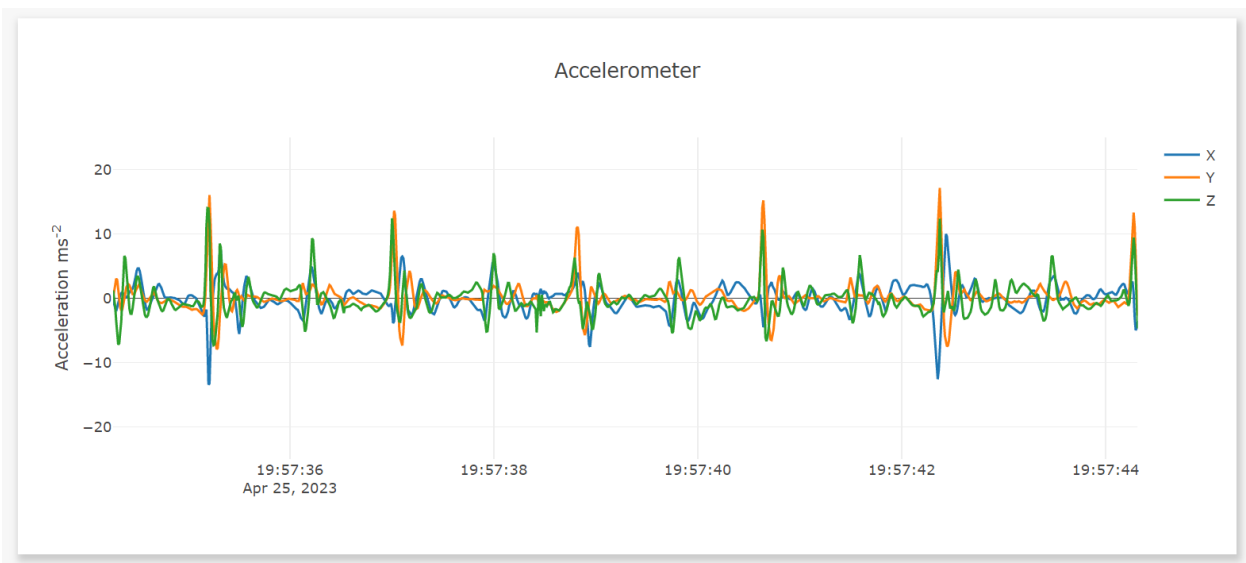
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Our group chose to create a program that will roughly measure the sobriety levels of the user based on various criteria. Some of the tests we planned to conduct included a walking test that would use accelerometer data to detect irregularities in the movement of the user, using voice recognition to detect slurring in the speech of the user, and using technologies featured in the apple watch to measure blood oxygen and blood pressure levels to give a rough estimate of how intoxicated a person might be. After some consideration and research, we decided to not move forward with the voice recognition portion, as it is not a good metric by way of consistency for intoxication due to variability between people in their alcohol tolerance and how the effects show.

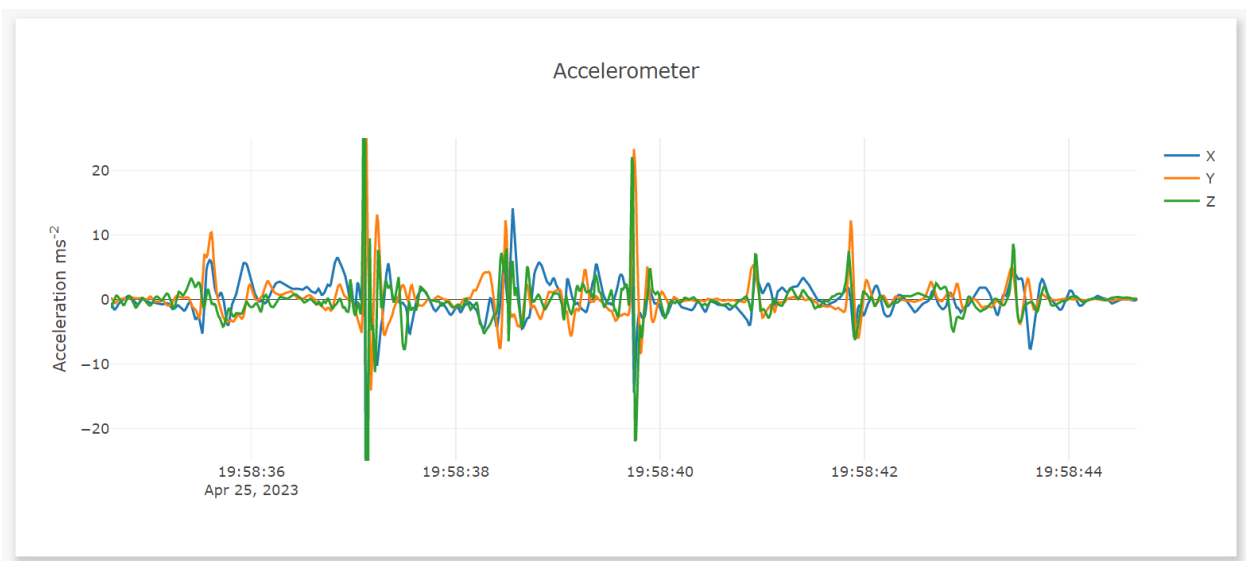
We decided to have two components to detect possible intoxication. First is by using the phone's inbuilt accelerometer to conduct a test, and the second is through an Apple Watch's capability of measuring blood oxygen levels. The user will conduct a small walking test, where they will take 10 steps heel to heel forwards, turn 360°, then take another 10 steps back to their starting point. We have begun collecting data by repeating the test multiple times while simulating different levels of intoxication, with the phone in the left pocket of the user. The 'sober' test, which is our baseline with which we compare against, is an example of a walkthrough with no mistakes and consistent, regular data. The other samples were created by adding increasing variations in swaying and lateral movement, simulating more and more intoxicated movement. We will create a classifier to detect these different kinds of movement, lateral swings, stumbles, steps backwards, etc. and based on the amount of these 'mistakes' the outcome of the program will be a report to the user on their predicted level of intoxication. We

will also be using the blood oxygen detector to detect changes in BOC, which for a regular person is between 95-100%, if there are lower levels that percentage will be taken into account when providing the level of intoxication to the user.

### Sample Walking Data Sets



Sober Steps



(Simulated) Intoxicated Steps

The differences in walking ability is demonstrated in these samples. For example, one significant difference is the use of force when stepping.