

Team 1: Artera

Team Name: apple.py

Project Name: Aware (Apple Watch Alcohol Risk Estimator)

Company: Artera

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Project Overview:

Our project aims to tackle the safety issues associated with alcohol consumption, particularly in social situations like college parties, clubs, and bars. We would develop a mobile application that is integrated with technology like apple watches and/or fitbits to measure physical indicators of intoxication, such as reduced heart rate and walking steadiness. Upon detecting that the user is intoxicated via machine learning classification of relevant walking steadiness and speed data, the app would send alerts of the user's location to close contacts (eg. friends) to escort the user home safely. In more severe situations, such as if the heart rate stops, the app would also be able to call 911. Apart from the alert system, the app would ideally encourage proper alcohol consumption by providing the user with information about alcohol safety and analysis by providing an accurate estimate of how much alcohol they can safely take given body weight, height, etc. in conjunction with food/water intake and vitals from the apple watch and give feedback throughout the night. It could periodically analyze BAC levels and advise users to "slow down", link users to call an Uber, or eat after drinking to reduce the effects of drunkenness.

Background/Significance:

- Over 1.5k college student deaths from alcohol-related accidents per year (including drunk driving). Over 22k college students per year are hospitalized from alcohol overdose, and nearly 600k college students per year are unintentionally injured while under the influence of alcohol.
- Apps for alcohol and drug safety are limited and not widespread enough to prevent deaths and illnesses. Additionally, an estimated 15 million people struggle with an alcohol use disorder in the United States, but less than 10% of them receive treatment.

Existing Solutions:

- BACTrack Skyn: wearable alcohol biosensor that measures transdermal alcohol content (TAC) from skin to estimate BAC range
- DrinkControl: app that helps manage and keep track of drinks, motivates users to not drink beyond the legal limits
 - Mark sober history / drunk history and motivate with keeping up streaks
- AlcoWear: infers the drinker's BAC level by classifying accelerometer and gyroscope sensor features gathered from their smartphone and smartwatch simultaneously using a machine learning approach.

Project Outcome:

- Our goal is to provide a smartphone platform with easy to access information about alcohol safety and make it easier to manage alcohol intake to reduce risk of overdose
- Help reduce the number of accidents that result from unsupervised drinking and help people get crucial medical help faster in certain situations
- Integrate a feature where users can keep track of level / number of drinks as well as how drunk they are feeling “sober”/”mildly intoxicated” / “drunk” / “very drunk” and combined with actual biometric data give user a better idea of how their actual level of drunkenness correlates with how drunk they are feeling
- Enhance the “buddy system” and serve as a tool for people to look out for each other more effectively in social situations involving alcohol

- Integrate a button on the Apple Watch to immediately call friends, family, or 911 when at risk of alcohol abuse or in other unsafe situations involving alcohol

Implementation Platforms:

- VS Code / XCode
- Implementing an IOS app for iPhone which connects to Apple Watch for biometric data collection

Technologies

- Some of our ideas include using OpenAI for health data analysis, an Apple Watch + Apple Healthkit for biometrics, along with the Walking Steadiness iOS feature. We aim to use Python for API calls and to communicate with the backend (and MySQL for backend / database development), Swift or Flutter for App Development along with React Native, GitHub and Kanban boards for collaborative coding.

Milestones

- We aim to create a simple interface design for the user, emphasizing function over design.
- We will examine prior work in the area as well as data available to decide on the metrics and machine learning algorithms to focus on for detecting intoxication levels as this is the core feature of the app.
- We will emphasize the ML and backend components of the app in order to test some features early on, and work on the frontend interface and user testing afterwards.
- Expanding other features will come after such as: sending alerts to selected contacts in case of needing assistance returning home and/or emergency attention, prompting users to take an Uber or have a snack at regular intervals, etc.