Introduction

- The amount of alcohol being consumed in the world has been on a steady increase and this trend is expected to continue. [1]
- Those that wish to relinquish their drinking habits are more likely to relapse when they are either not treated correctly or not treated at all. [2]
- The ability to monitor a person’s psychophysiological responses in real-time through a wearable device such as the Empatica E4 allows for more consistent and natural data collection.

Objective: Design an alerting system that uses real-time data to alarm the user when their physiological responses signify increasing levels of stress.

Hypothesis: By using a wearable device that monitors a person’s psychophysiological responses, more specifically electrodermal activity (EDA) and heart rate (HR), the possibility of relapse can be prevented because the person will be notified when their responses increase over a stress threshold.

Methods and Materials

- Participants:
  - 2 current participants
  - More than 10 participants are expected to contribute
- Device:
  - E4 wristband from Empatica [3]

Procedure:
- 2 weeks of data collection from the E4 wristband
- Daily Likert Phone Survey (4x per day)
- Create a TAG when feeling stressed or cravings
- Phone Survey:
  - Consisted of questions regarding emotion and alcohol cravings
- Software:
  - EDA Explorer [4]
  - Ledalab through MATLAB [5]
  - EDA/HR Analysis Scripts [6]

Results

Table 1 is the average results gathered from a peak analysis of the electrodermal activity noise analysis where a normal heart rate ranges between 60 to 100 bpm.

Table 2 is the distribution of the heart rate per participant. The amount of alcohol being consumed in the world has been on a steady increase and this trend is expected to continue.

Discussion

- Each participant’s data was collected into one excel file based on chronological order at the end of their participation to ensure accuracy and proper execution of the analyses.
- Figure 2 is a display of the typical electrodermal activity noise analysis where the red marks display noise, the gray displays questionable data, and the rest being clean data.
  - Noise refers to data that may be corrupted or distorted during the process of data collection.
- Chart 1 shows the results of a noise analysis that was executed to determine the quality of the EDA data.

Conclusions and Future Work

- The preliminary results acquired from the analyses have resulted in success in terms of quality and reliability.
- Future work consists of the following:
  - Continue acquiring psychophysiological data from more participants.
  - Integrate the responses from the phone surveys to the collected data to find stress/craving correlations.
  - Design machine learning algorithms that will be able to detect any indicators of potential relapse based on the data acquired.

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