Team 3: Backlog for

Heart Rate & Behavior Analysis Tool (HBAT)

Problem Statement

There is not currently an intuitive and easy to use software available to analyze heart rate data and behavioral attention data. Our project will implement an algorithm that will compare heart rate with other data to provide a heuristic to assist in the diagnosis of infants who are considered at high-risk for autism.

Background Information

One of the goals of autism research is to detect the disorder in children as early as possible. One possible means of detection is the analysis of heart rate deceleration. However, many psychologists who are responsible for designing experiments have a weak background in computer science, which makes it challenging to analyze the data in complex ways.

The current method of analysis used by researchers in this field is to use statistical softwares like SAS and Excel. Another solution is to implement a solution using Python or another programming language.

The issue with many of the existing solutions is that they take a long time to implement for someone without a computer science background. Also, some of these softwares can be prohibitively expensive. The aim of this software is to make a free software that is easy to use and accessible to any researcher, regardless of technical background.

Requirements (Backlog)

Functional Requirements:

Core Features:

1. As a researcher, I would like to process heartbeat data in order to analyze it against behavioral data.
2. As a researcher, I would like to input data in a form of a CSV file.
3. As a researcher, I would like to export results in CSV files.
4. As a researcher, I would like to be able to create visualizations of the data.
5. As a researcher, I would like to export visualizations.
6. As a researcher, I would like “tool-tips” for features I may not understand.

Additional Features:

7. As a researcher, I would like to combine other sets of data and analyze them.
8. As a researcher, I would like to have a general summary of each experiment.
9. As a researcher, I would like to input data from Excel.
10. As a researcher, I would like to export results as an Excel file format.
11. As a researcher, I would like to drag and drop necessary files within the GUI to input them.
12. As a researcher, I would like to be able to process and organize data in batches.

13. As a researcher, I would like to customize how the data is batched together.
14. As a researcher, I would like to be able to access profiles for individuals.
15. As a researcher, I would like to be able to switch between an individual view and a holistic view.
16. As a researcher, I would like to check on multiple infants data in a tabular format to spot differences/similarities.
17. As a researcher, I would like to be able to organize batch data by characteristics of the data (Male vs. Female, Low vs High-risk, etc.).
18. As a researcher, I would like be able to specify different phases throughout the timeframe of the experiment.
19. As a researcher, I would like to graphically represent those phases.
20. As a researcher, I would like to customize the appearance of the graph, such as colors, fonts, icon shapes, etc.
21. As a researcher, I would like to be able to see a progress bar when processing datasets which take a long time.
22. As a researcher, I would like to be able to do certain functions in multiple ways (e.g. Export with menu bar, right click, and java.swing button).
23. As a researcher, I would like to easily sync up the data inputs to start at the same time stamp.
24. As a researcher, I would like to be able to manually be able to type in the behavioral data at specific timestamps.
25. As a researcher, I would like to add event notes at specific timestamps.
26. As a researcher, I would like to be able to access patient data from within the program.
27. As a researcher, I would like to be able to calculate basic statistics for specific phases of data.

Non-Functional Features

1. As a researcher without a programming background, I would like this to be easy to use.
2. As a researcher, I would like the application to work in both Windows and Mac operating systems.
3. As a developer, I would like the project to be easily extensible.
4. As a researcher, I would like the program to be intuitive.
5. As a developer, I would like to create a file type to store patient data.
6. As a researcher, I would like the installation process to be easy.
7. As a researcher, would like (to have it analyze quickly.)