Data Visualization and Emotion Detection

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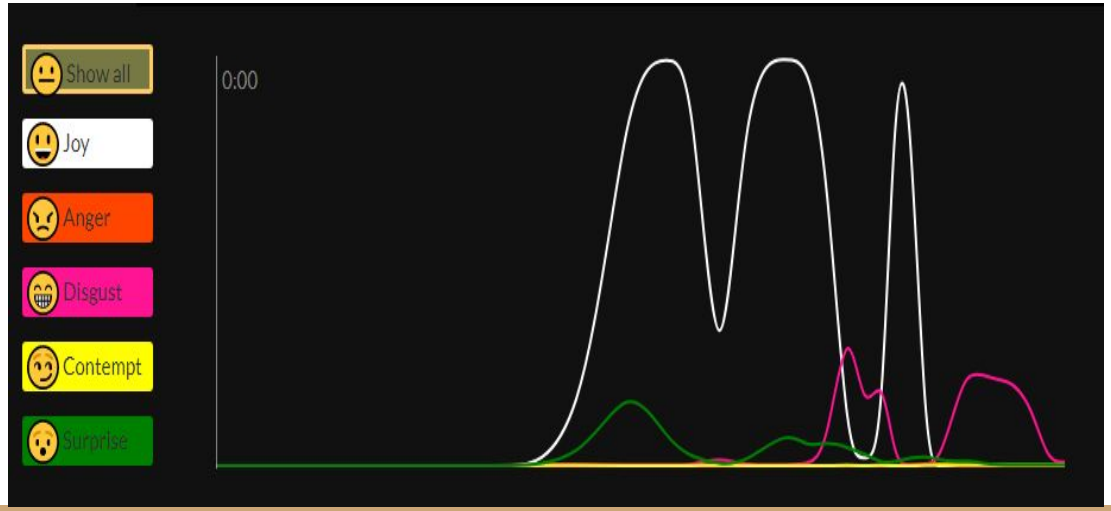
Our Project

- We are using Affectiva, an emotion-sensing software, explore connections between how engaged a person is and how well they read data visualizations.
- In an experiment, participants will analyze a bar chart, pie chart, and bubble chart while their facial expressions are recorded and analyzed by Affectiva.
- The emotion stream will be merged/compared with participant performance to find correlations between the two.
- The results of the experiment may tell us about how well people can use data in stressful situations (e.g. the doctor’s office).

Affectiva

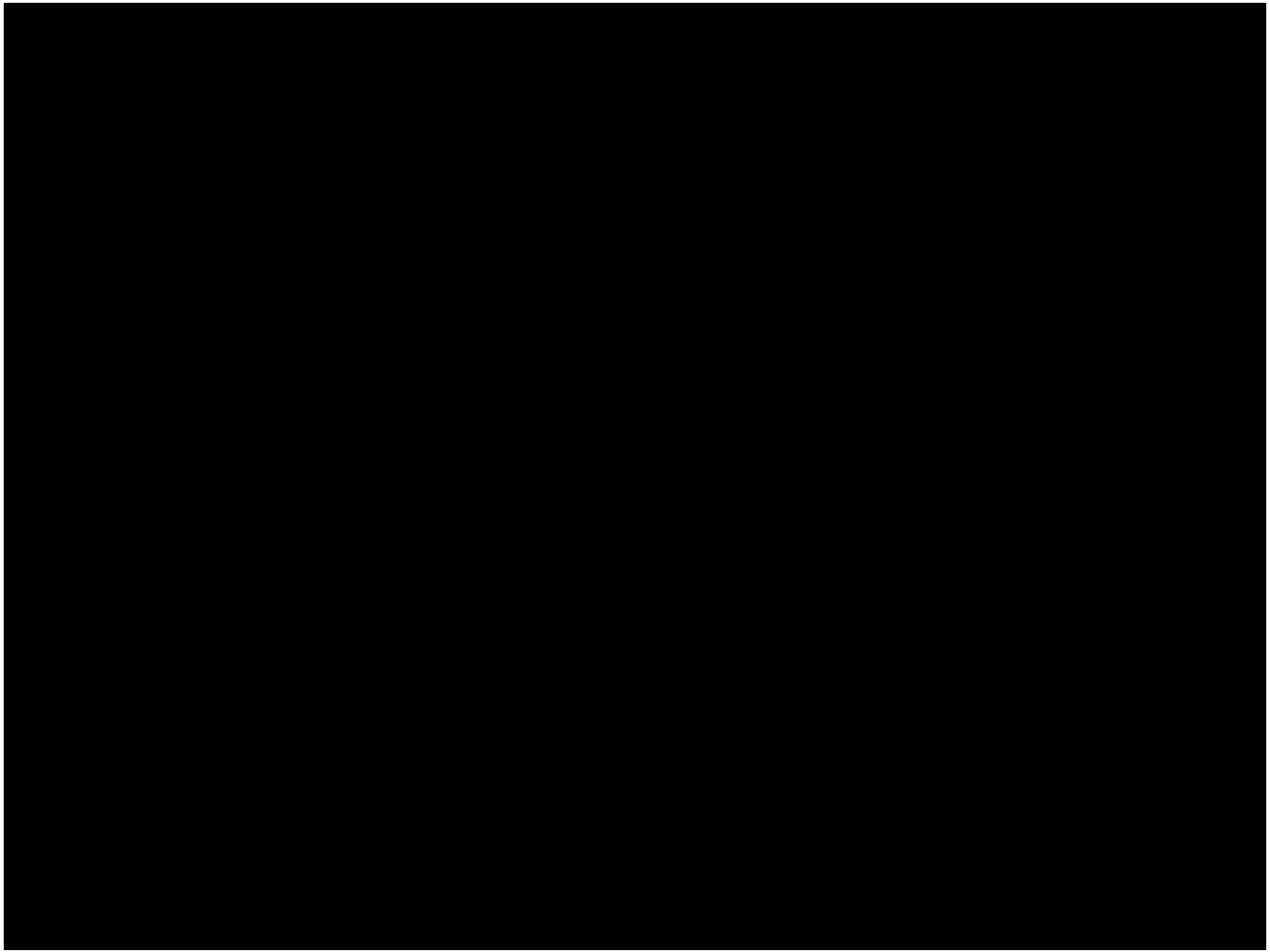
:) Affectiva

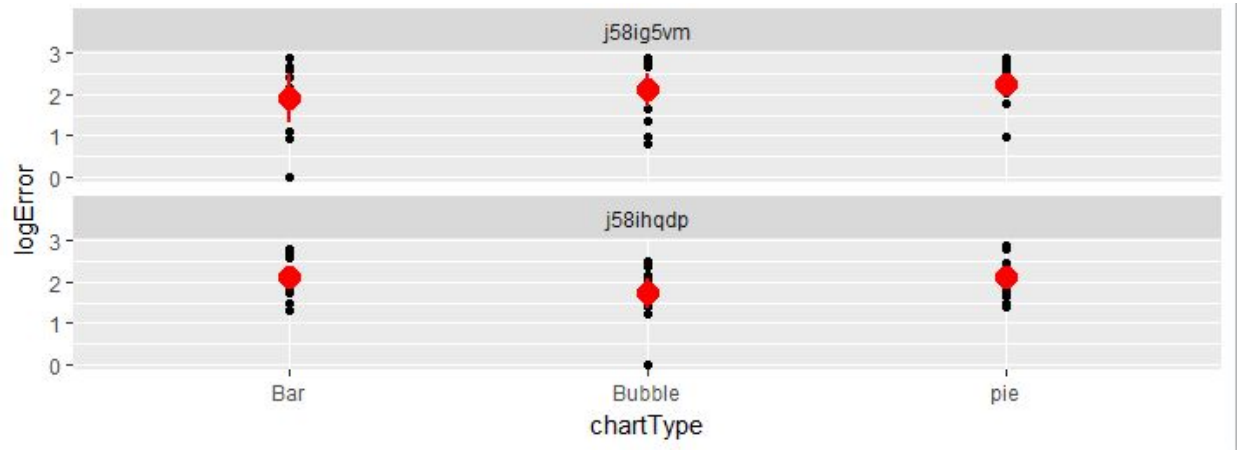
- Affectiva is an emotion measurement technology company developed from MIT's media lab.
- Its ability to recognize key emotions achieves accuracy in the 90th percentile; developers continue to improve and test algorithms.



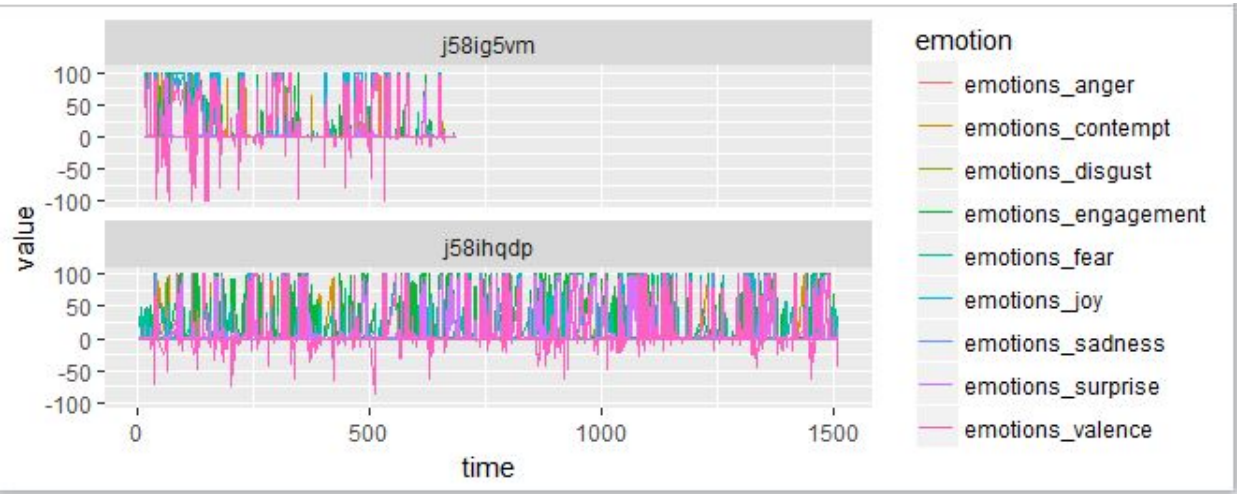
Running the Experiment

- We tested six participants for our experiment.
- The participant is given 36 problems to solve. After the experiment is run, they are given a code specific to their data set and asked to answer a survey.
- We implemented a survey at the end with emotions that correspond to the ones Affectiva recognizes. The survey shows us the accuracy of Affectiva and helps us decide which parts of the emotion stream data to use.

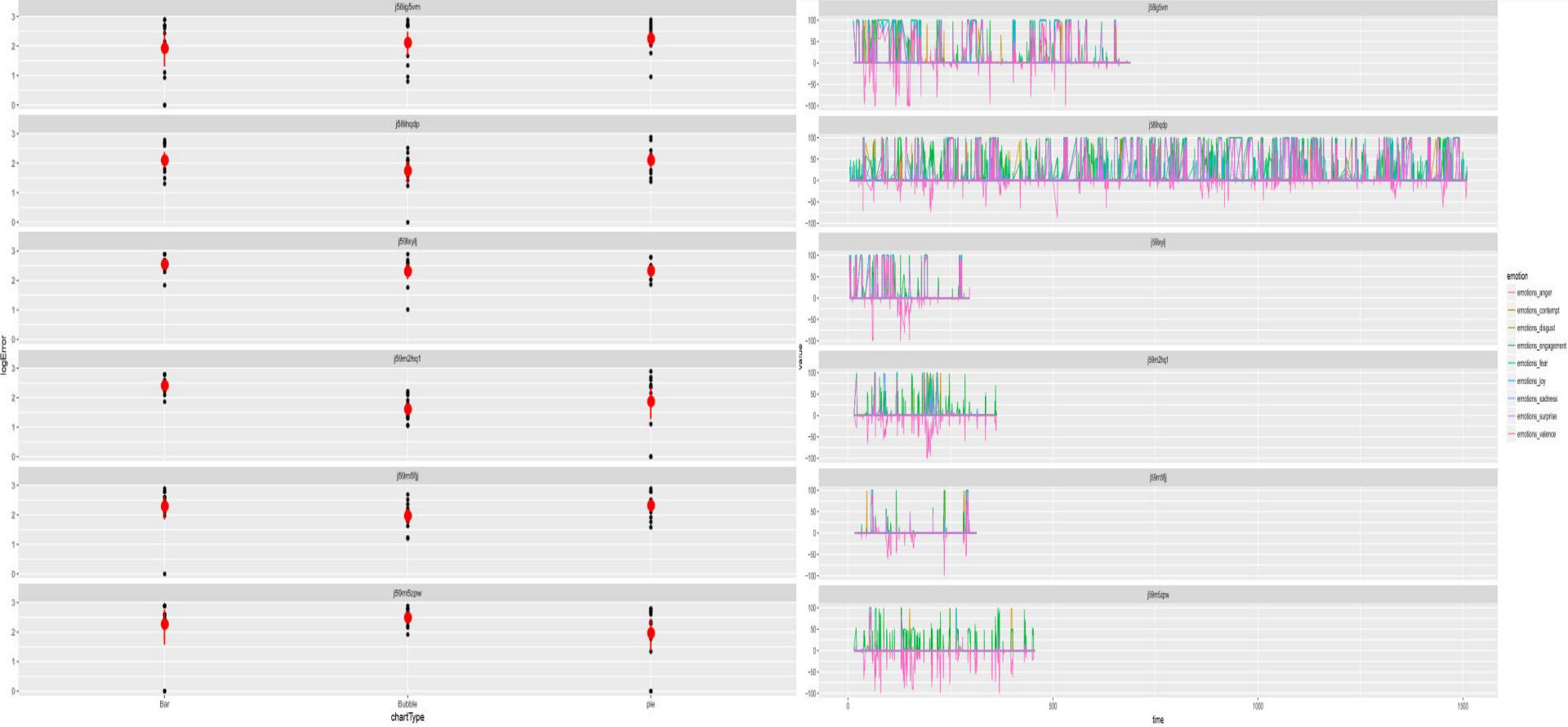




An error chart faceted by two participants and organized by chart type.



An emotion chart faceted by the same two participants and organized by emotions.



The error and emotion charts for each of the six participants.

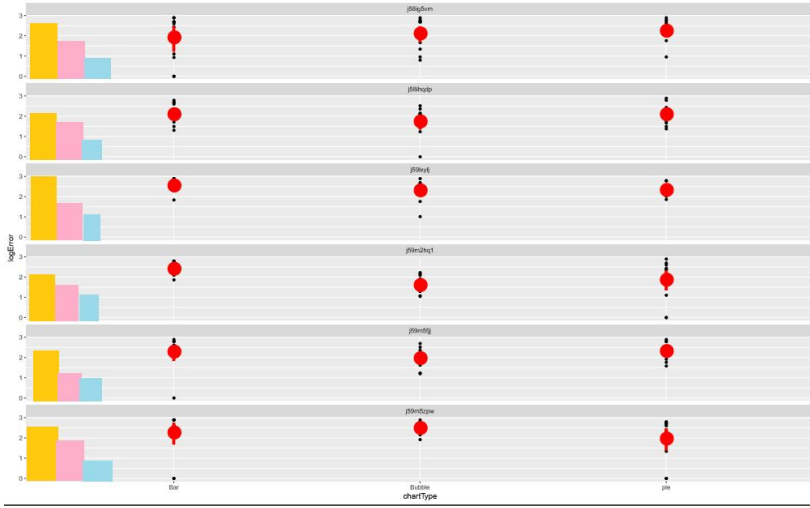
An error chart faceted by participant in line with an emotion chart showing engagement (red) and valence (blue).

Our Findings (So far)

- One of the best performers had a mostly negative valence, consistently high levels of engagement, and emotional stability.
- Another one of the best performers had mostly positive valence, high levels of engagement, and relatively stable emotions.
    - This implies that “emotion variance” is worth looking into further.
- On average, half of the participants showed negative valence; half showed positive valence.

Ideas for Chart Designs

- Create a bar chart with an average of the top 3 emotions the participant was feeling and combine that with the error chart. (bottom right)
- Combine the error chart with a line graph of engagement and valence.
- Combine the error chart with a line graph of any other relevant emotions.
- Or all three!



Further Work to be Done

- Choose a method of organization of the data for final analyses; join emotion and trial data.
- Find if there are any correlations between the two data sets; make further observations about the two data sets.
- Create a poster presentation.