



Creating A Web Application to Analyze Biofeedback to Convey Emotion

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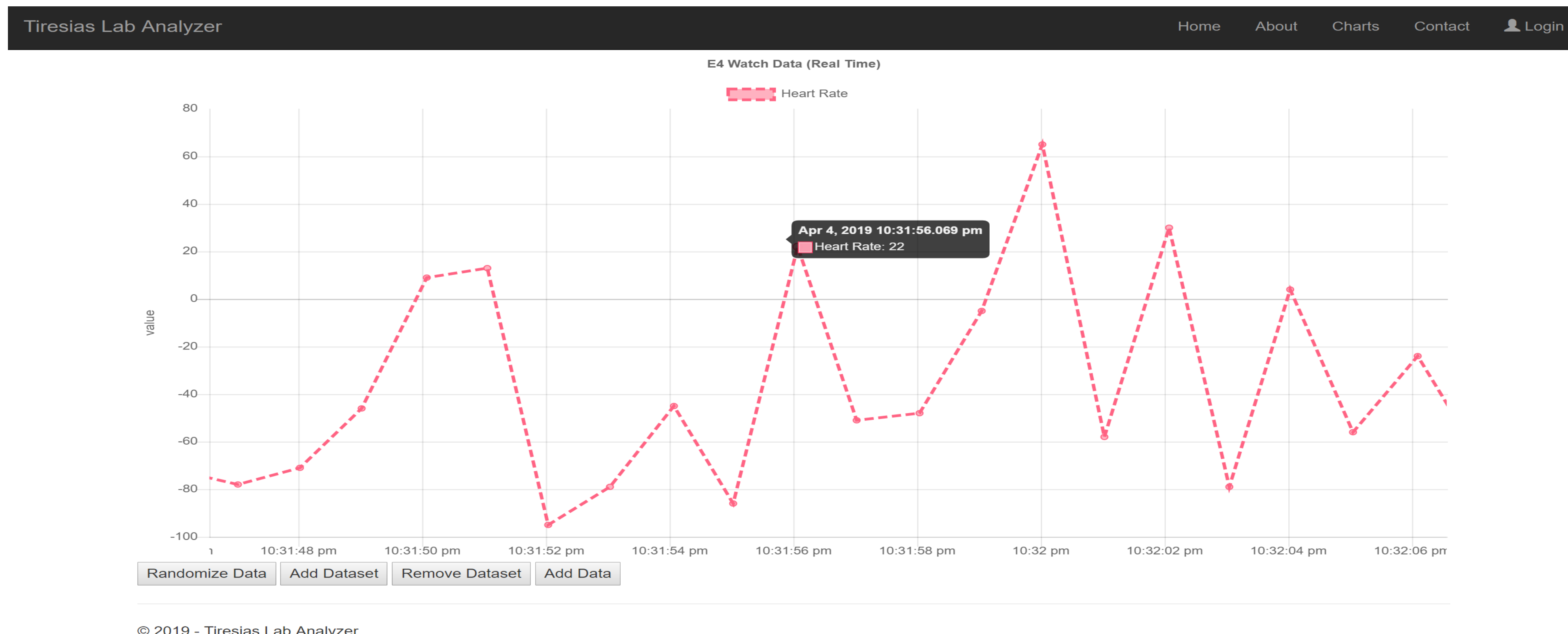
National Science Foundation

ABSTRACT

- The response of the interviewee, such as his or her emotional state, plays an important role on the quality of the collected requirements and helps the interviewer respond accordingly.
- Creating a web app allows interviewers to see the statistics gathered from the E4 wristband and the emotion that the interviewee is experiencing in real-time.
- Biofeedback information is being extracted from the E4 wristband using a server-to-client console method and supervised machine learning techniques are being used to display emotion.

BACKGROUND

- Requirements elicitation interviews are the most commonly used technique to gather requirements. This is a crucial and difficult activity on which the quality of software depends on.
- Emotions such as stress help determine whether or not an interview is successful or not by dictating the level of attention and engagement of the interviewee. Emotions are not always easy to identify by observation. However, they can be detected by looking at various vitals (e.g. rate of blood flow, heart rate, and temperature) and voice parameters.



Web application giving E4 wristband data in real-time

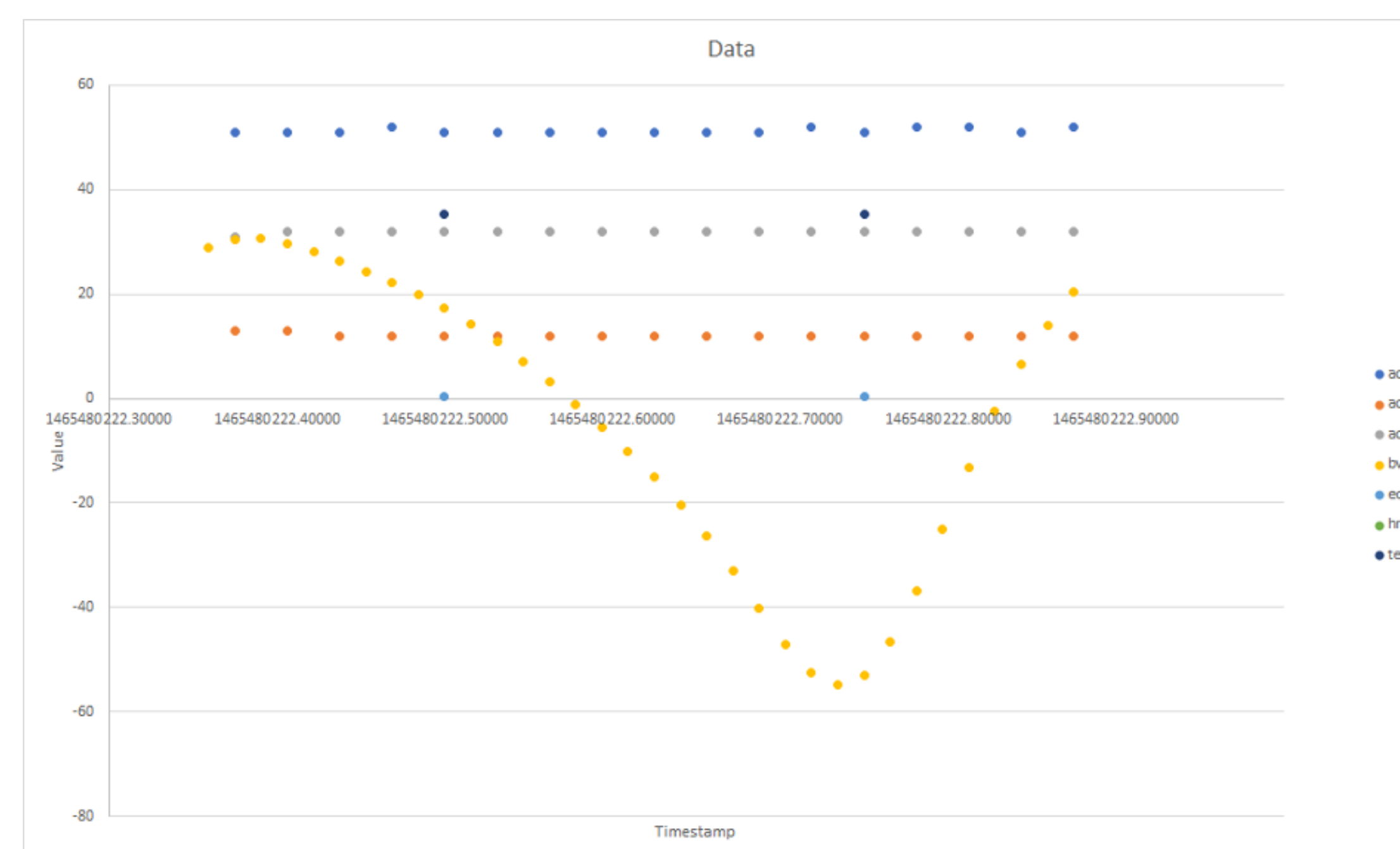
METHODS

Web Application:

- Use ASP.NET core framework to build app
- Use server-to-client console method
- Program with C#, Razor, MVC, HTML, & JS
- Use of Chart.js package to display data from watch

Machine Learning:

- Retrieve and clean biofeedback data from the E4 wristband
- Collect and enter data from image surveys
- Use logistic regression to average the heart beats with the other biofeedback data
- Build ANN using Python and Tensorflow



Result of Python script consolidating biofeedback data from different files

```
device_subscribe gsr OK
Gsr 1543954455.029 0.006405866
Gsr 1543954455.279 0.006405866
Gsr 1543954455.529 0.007687042
Gsr 1543954455.779 0.006405866
Gsr 1543954456.029 0.006405866
Gsr 1543954456.279 0.007687042
Gsr 1543954456.529 0.006405866
Gsr 1543954456.779 0.006405866
Gsr 1543954457.029 0.005124689
Gsr 1543954457.279 0.006405866
Gsr 1543954457.529 0.007687042
Gsr 1543954457.779 0.006405866
Gsr 1543954458.029 0.006405866
Gsr 1543954458.279 0.006405866
```

Empatica server-to-client console method giving Gsr values

ACKNOWLEDGMENTS

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CONCLUSION

The intended outcome of our on-going project is to have a complete web application that provides the interviewer with a GUI interface for collecting and analyzing data on the interviewee, as well as conveying the emotion of the interviewee using machine learning techniques.