Developing Effective Data Analysis for Speech Pathologist

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Abstract

The CDC estimates that each year around 7000 children are born with cleft palates. These children often go through reconstructive surgery, yet still suffer setbacks in their verbal development due to the nature of their condition. Failure to develop proper speech skills can lead to the development of social and emotional issues later in life. The mobile application Speech Adventure seeks to provide a supplement to speech therapy following surgical correction of cleft palates through a speech therapy game, and collection and processing of diagnostic data. Speech Adventure, through the implementation of data visualization, seeks to provide robust and easy to use statistical analysis tools to speech pathologist for use in treating individuals with cleft palates.

Motivation

Child with cleft palate
http://www.chw.edu.au/prof/services/cleft/

Children with cleft palate often find it difficult to engage in at home speech therapy due to its similarity to homework and/or its inability to engage in fun interactive manners with users.

The goal is to build an application to be used in conjunction with traditional speech therapy, that provides at home therapy games to children while simultaneously collecting data about the patient's performance.

Application Goals:
- **Game Play**
- **Speech Recognition**
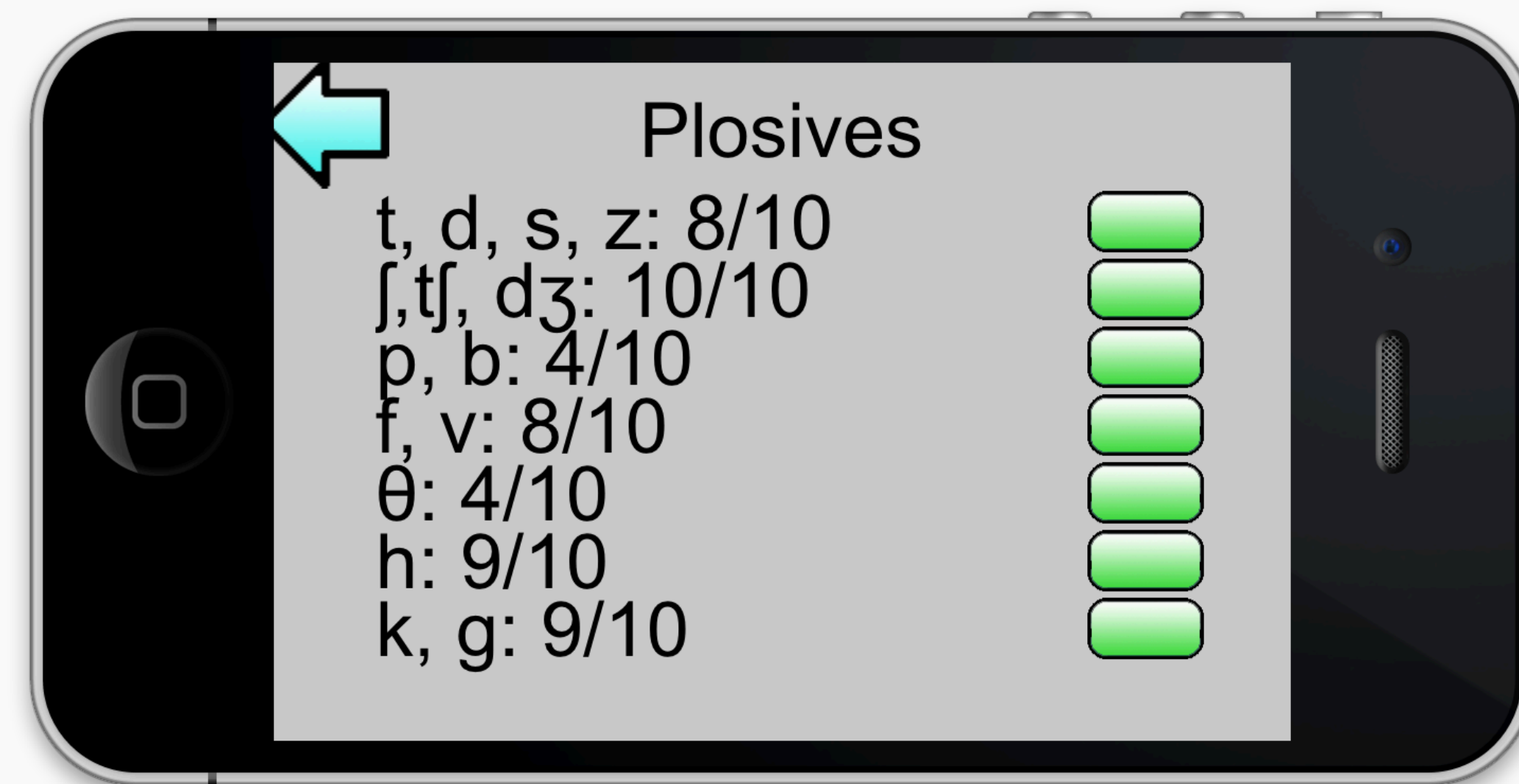- **Data Analytics**

Advancement

Previous development had focused on developing a robust engine on which to base speech recognition and game driving tasks. Up until now development had been focused in these two areas and had yet to take on any of the issues associated with data collection.
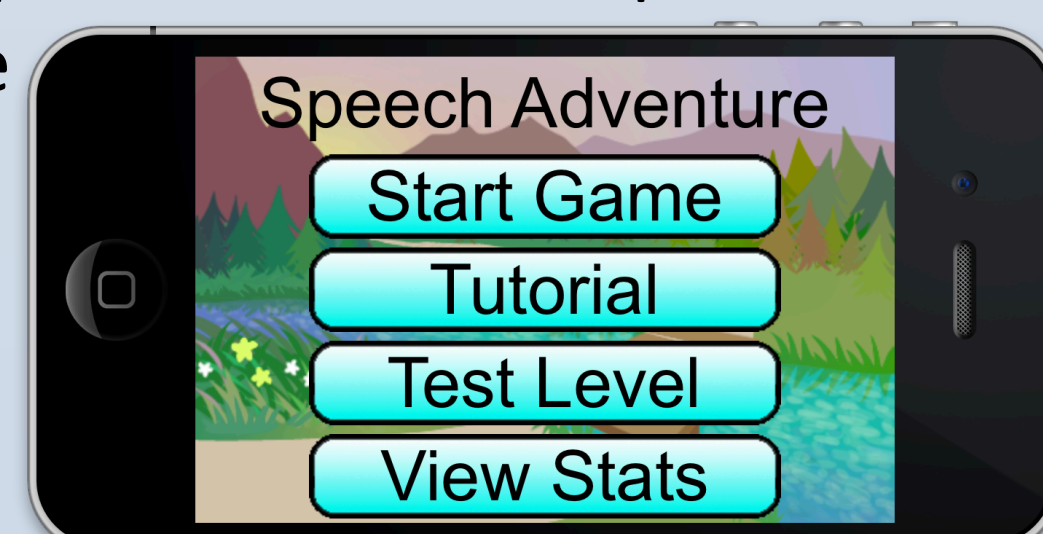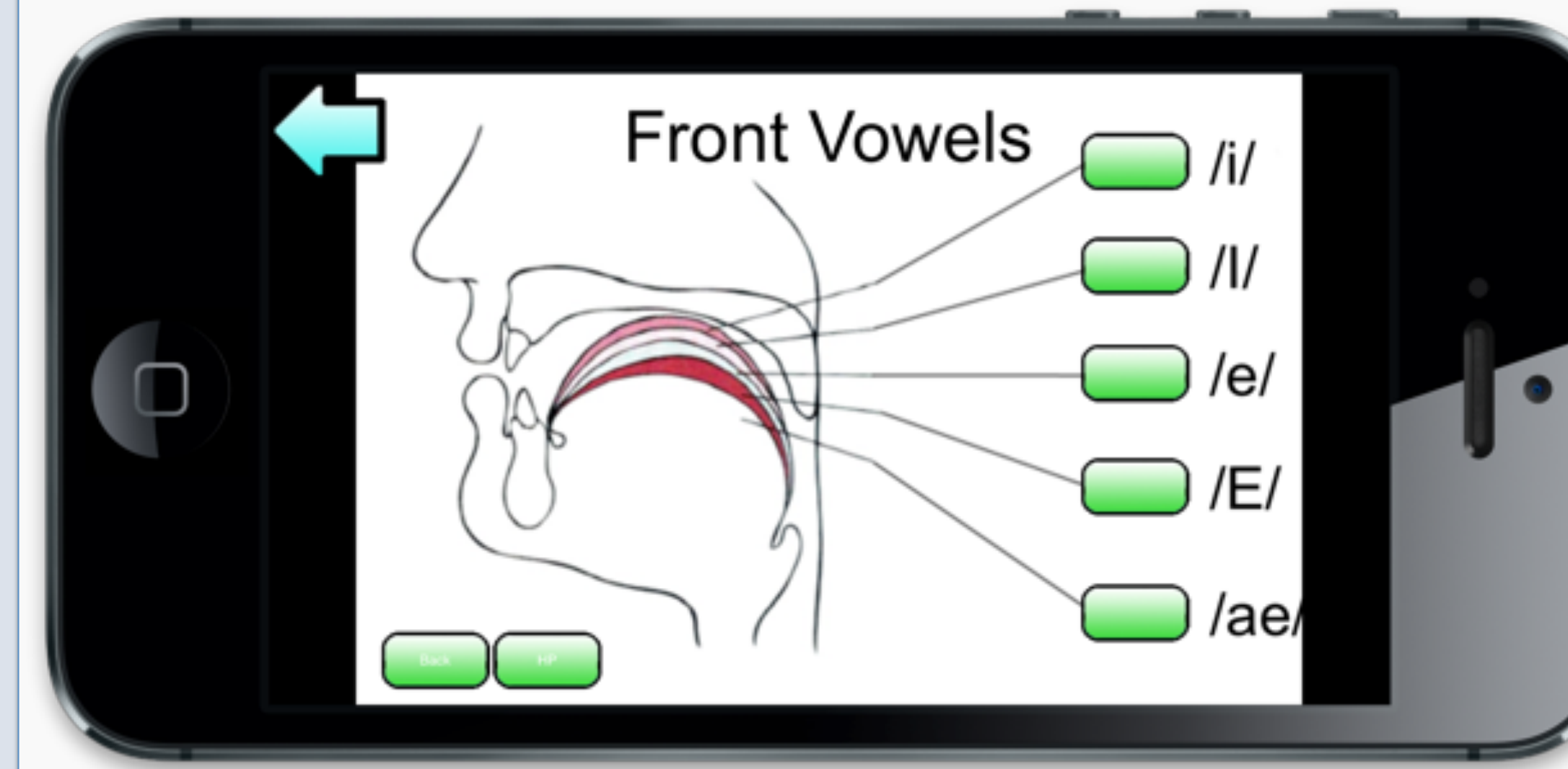

Current Main Menu of Speech Adventure
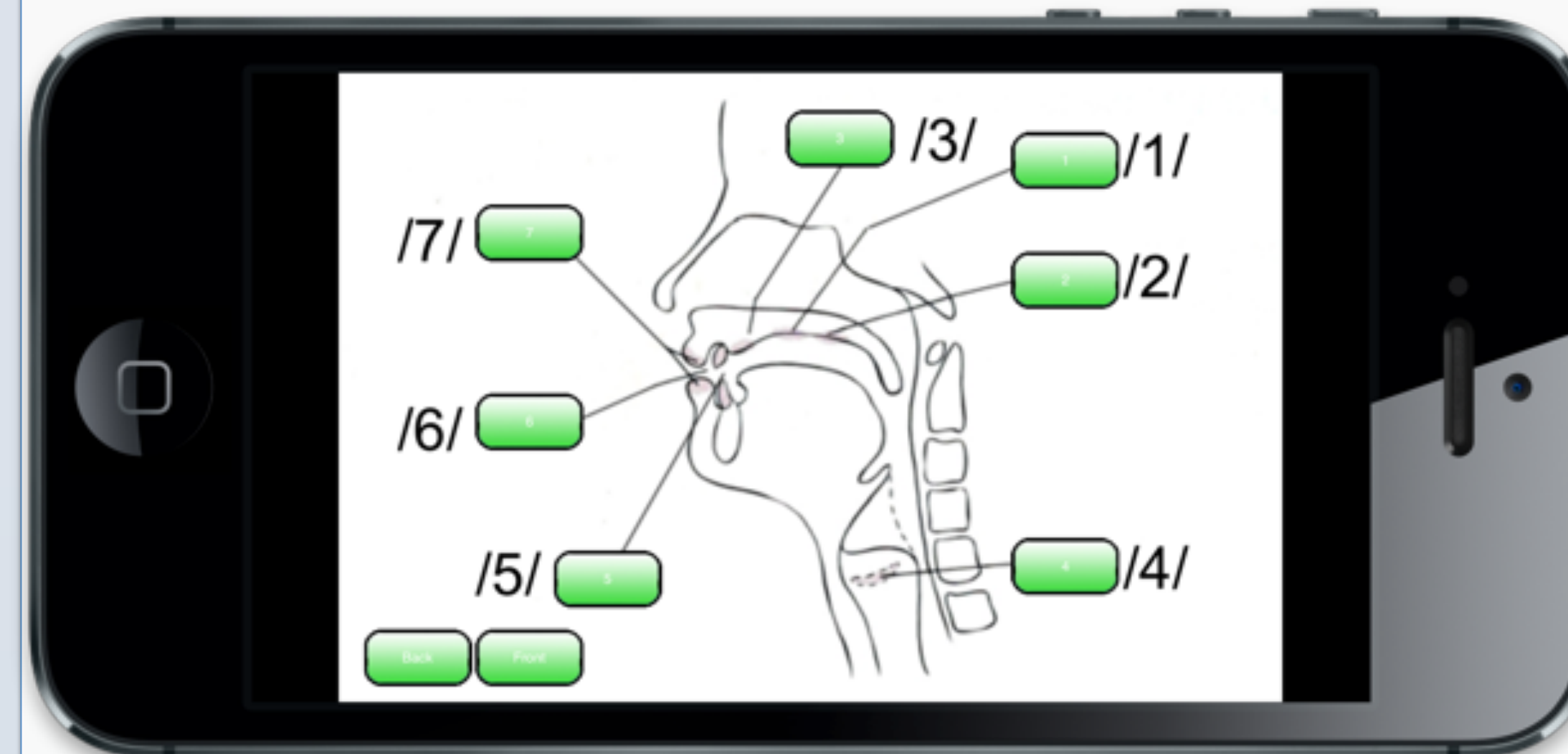
Statistics Visualization

Previous Statistics View
Buttons were unresponsive and labels required background knowledge to utilize.
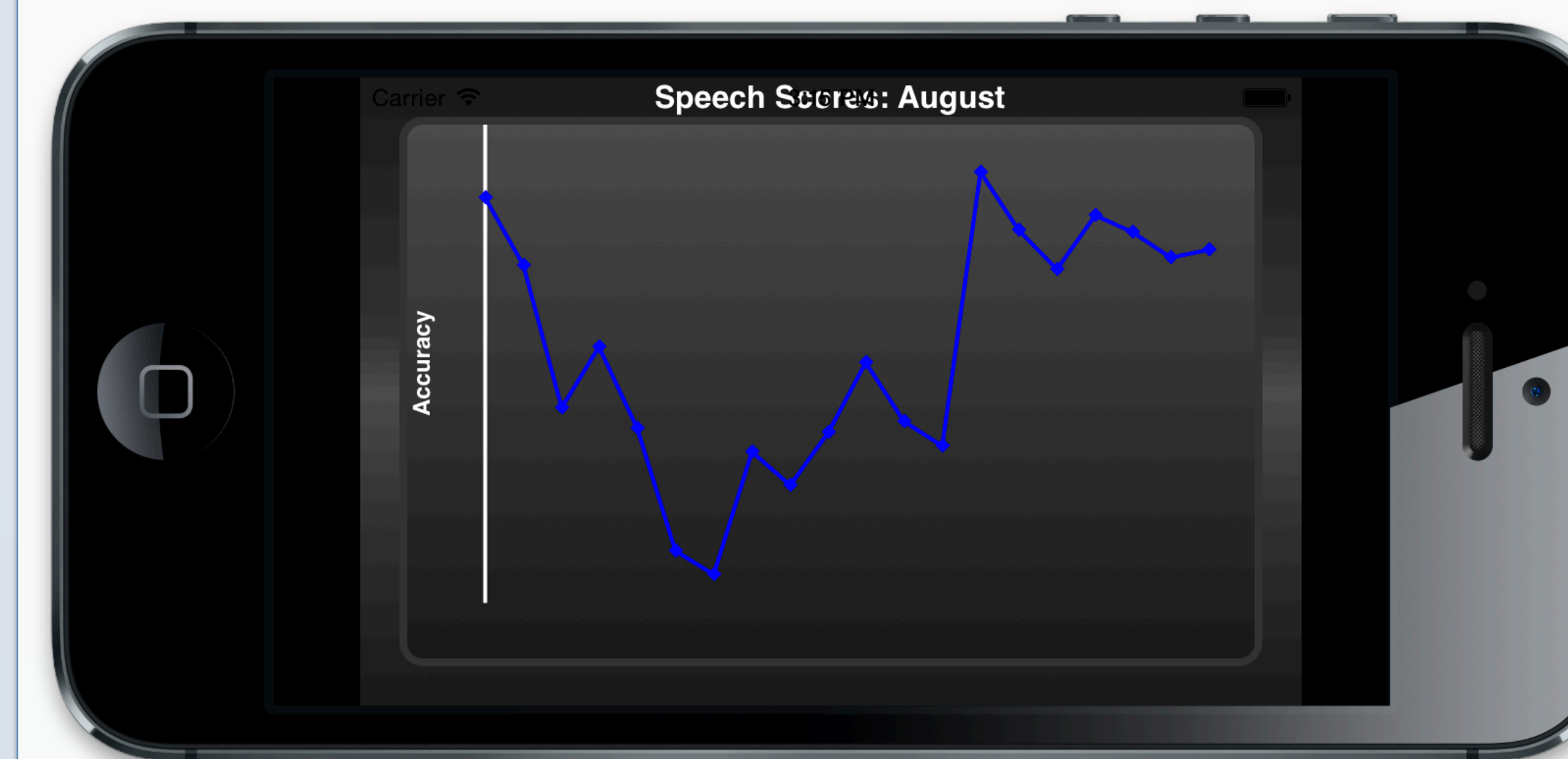

Current Statistics Design
Buttons are now associated with specific anatomical regions that effect speech

Buttons Arrangement
Buttons are arranged in a one-to-one correlation with their relative regions.

Data View
After selecting one of the buttons on the visual representation, a user is then shows a scatter plot of a patient's data for that month.

Developmental Advancements

Through the implementation of open-source data visualization, the advancements seek to present large amounts of diagnostic data in a simple and easy-to-use interface. Furthermore, by correlating user interaction with clinical diagrams the application is now able to present data in a way that is more conducive to the end-user.

- **Implementation of CorePlot Framework**
- **Implementation of functionality in data visualization**
- **Development of Speech Pathologist centered data tools**
- **Development of data collection protocols**
- **Design of graphic data representation**
- **Fluid interactions between labels and data**

Post Development Overview

- **Data is now correlated with anatomical models.**

- **Data is now more easily accessible to speech pathologist**

- **Automated data collection has been streamlined**

Conclusion

- Through the implementation of these new data analysis tools it is now possible to easily navigate data from inside the application.

- Speech Therapist and Speech Pathologist may now utilize the aforementioned data to monitor patient progress and to target specific areas that need improvement within one on one speech therapy sessions.

- Ultimately, these further develop and seek to streamline data collection and data viewing for the overall betterment of the patient's progress in speech therapy.

Acknowledgements

Contact Information

For any further questions please feel free to contact

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