Smartphone App Development for Stress and Anxiety Monitoring Study

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Problem

According to the Department of Department of Health Chronic Disease Prevention & Health Promotion Division, **one in every 3 adults in Hawaii has been diagnosed with hypertension.** Native Hawaiians and Pacific Islanders face a rate of 628 deaths per 100,000 residents which is far greater than the 154 deaths among Asians and 167 deaths among White residents in Hawaii.

Solution

Implement a smartphone app for **ST**ress and **AN**xiety **D**etection (**STAND**) to be used in a study that aims to gather users' stress and anxiety data whilst they play cognitively challenging and stimulating games.

The users' faces are recorded while playing these games, and these recordings will be used as training data for an AI model that will be able to detect hypertension in people with high blood pressure.

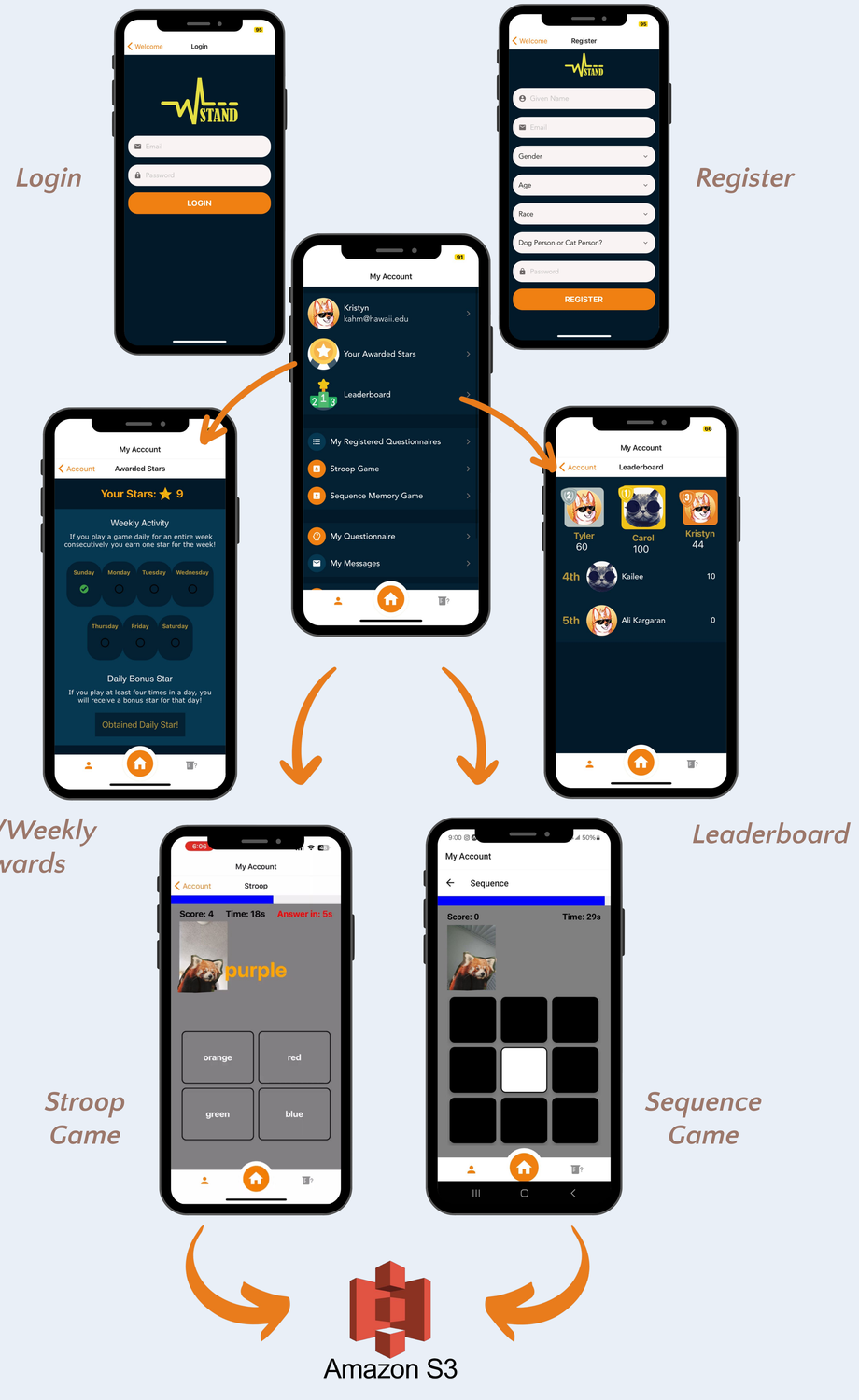
This stage of the project focuses on continuing development for pre-existing features of the app, as well as augment the **gamification** aspect to enhance the user experience.

1. Upload all recorded videos to **AWS**, where it can be analyzed
2. Incentivize users to log in frequently with **daily rewards and a weekly leaderboard**
3. The addition of a **second, stress-inducing game** to gather more data

Methodology

- **Management**: Agile methodology, Github
  - Weekly meetings with the sponsor to discuss progress, issues, and next steps, with demos when applicable.
  - Internal meetings twice a week to collaborate.
- **Tech Stack**: JavaScript, React Native, AWS, Expo Go

Application



Challenges

Some challenges we encountered were…

- The need to refactor previous code that was no longer compatible with new software updates
- Working with video recording software in mobile apps, which was unfamiliar
- Creating and implementing a new game idea from scratch
- Researching to ensure participant security and privacy when uploading videos to AWS

Takeaways

Technical Skills	Soft Skills
• Working with a existing codebase • Increased expertise with the technology stack • Improved understanding of mobile app development	• Collaborating with a client to set and meet goals week-by-week • Communicating with a client to set up meeting times promptly update in case of rescheduling • Keeping extensive meeting notes and setting agendas

Next Steps

- Begin the user study to collect user data and participants' feedback
- Further enhance the UI to provide a more satisfying user experience
- Create a tutorial for users when they first use the app
- More extensive testing and bug-fixes

References

1. Kargarandehkordi, A., & Washington, P. (2023). *Computer vision estimation of stress and anxiety using a gamified mobile-based ecological momentary assessment and deep learning: Research protocol*. Cold Spring Harbor Laboratory. http://dx.doi.org/10.1101/2023.04.28.23289168