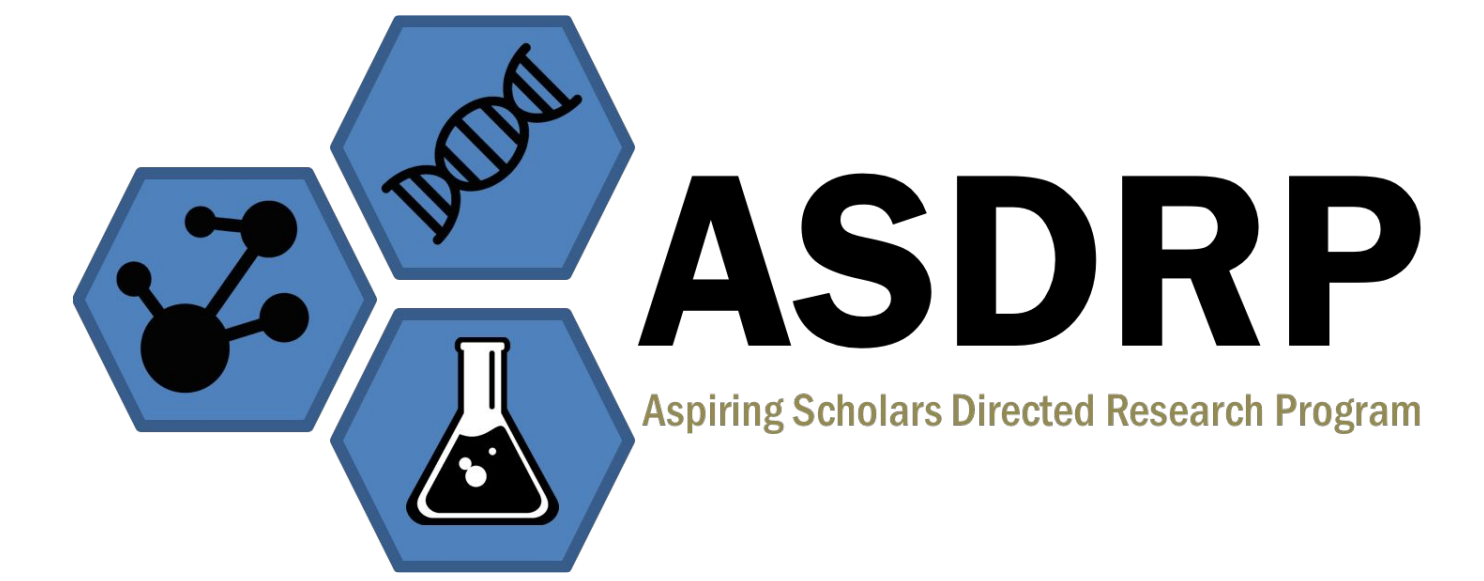


Aggregation of Computer-Based Cognitive-Training/Rehabilitation and Personalized Brain-Care Interventions into the CognoTrain App

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Abstract

Methods of CBCT/CBCR (Computer-based Cognitive Training/Rehabilitation or Brain-Care) have shown effectiveness as a means of positive intervention for groups of early-stage Alzheimer's disease and Dementia patients, but their development and testing occurred independent of one another. CognoTrain will function as an aggregate of these therapies to provide a holistic means of rehabilitation. Implemented CBCT measures in the app such as an address reminder system have proven to minimize symptoms such as topographical disorientation. The combined power of these techniques would produce an unprecedented level of cognitive improvement, introducing the possibility of a better life for more than 50 million dementia patients worldwide.



Auditory
Personalized visual
Cognitive Training
Neuroscience
Alzheimer's Disease
Motor
Chatbot
Research

Introduction

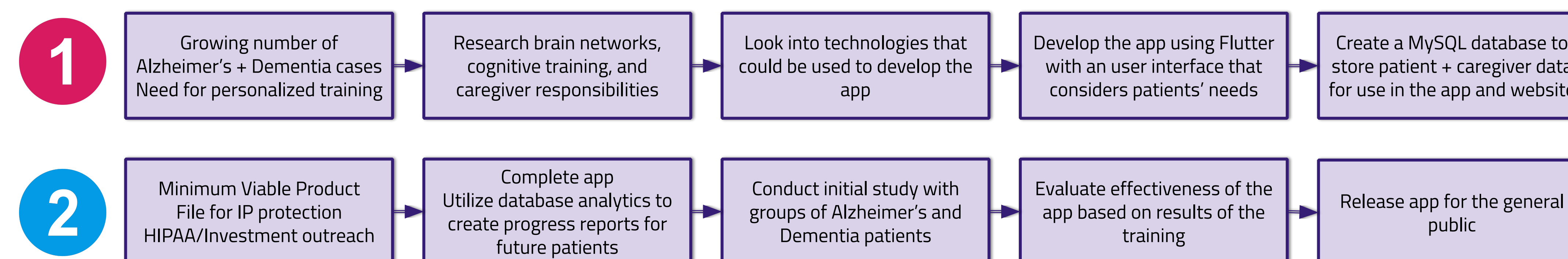
- CBCT/CBCR has shown positive influence on groups of Alzheimer's patients, resulting in:
 - Mental state and quality of life improvements
 - Decreases in patients' Clinical Dementia Rating
 - Improved short term memory
- Dedicated cognitive training app would be helpful for Alzheimer's patients, who do not have large-scale access to such technology
- A commercial app would be more accessible than proprietary technologies that hospitals may use

Methodology

- Conduct research on the needs of patients with early stage Alzheimer's/dementia
- Design a personalized platform that can meet these needs
 - Platform should be able to train patients with activities targeting each major brain network
- Conduct a study to test the platform on early stage Alzheimer's/Dementia patients
- Analyze the results of the study to determine if it is effective
- Seek out sponsorships from non-profit organizations

Results

- Developed the home screen, user settings, and numerous activity pages
 - Targeted various networks of the brain such as visual and motor
- Considered user interface with patient in mind
 - Integrated color research to enhance feelings correlating to the given colors
- Developed a structure for a database to anonymously store user information
 - MySQL Database
 - Anonymity with individual user-tables



Technologies

Flutter & Dart

- Flutter is a software platform that utilizes the Dart programming language. It offers:
 - Cross-platform development with one codebase
 - This includes iOS, Android, and Web
 - A vast ecosystem of secure, easy-to-use plugins and technology
 - Many were developed by Google, the creator of Flutter and Dart
- Overall, it allows for a speedy development of our prototype.

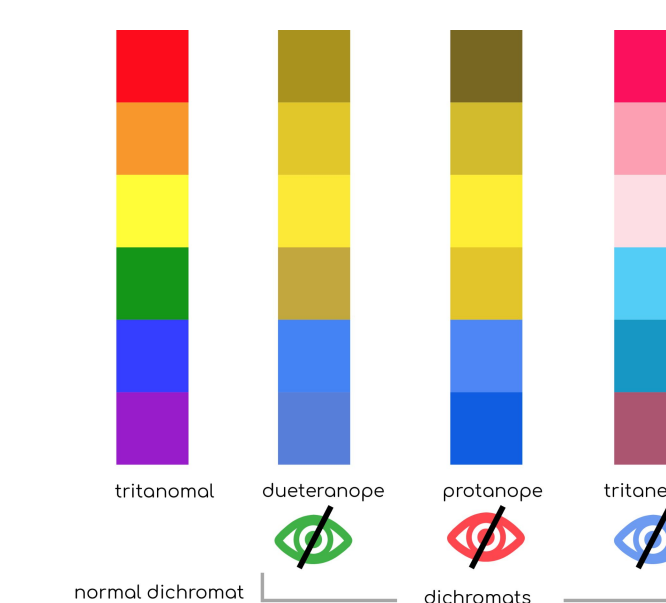
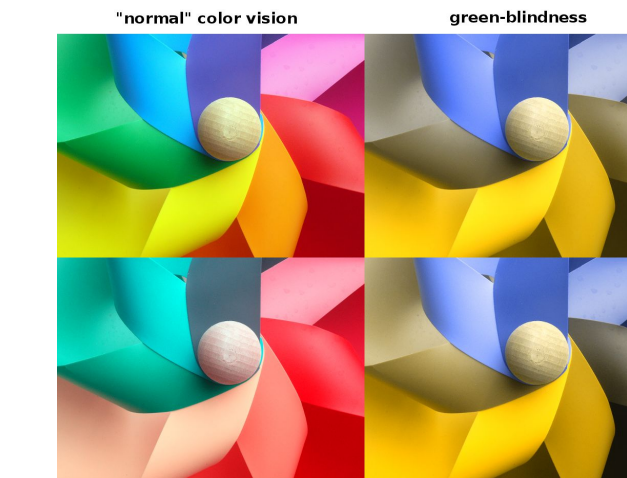
MySQL

- Relational database used to store user data, including personal information and images
- Utilizes the SQL query language in order to manage data from the database
- Mature community and support



Future Directions

- New features (e.g. color blindness accessibility provisions) allowing for a more holistic and comprehensive platform



- Adding ability for each patient to customize the app to their preferences and requirements



- Develop caretaker database in conjunction with the existing user account database so that hospitals and other institutions may view progress and provide further care to patients
- Seek sponsorships from non-profit organizations to provide us with the resources required for future development and HIPAA compliance

Conclusion

- Computer-based training apps have been proven to be effective in targeting patients of Alzheimer's and dementia
- Utilizing an app can increase accessibility and overall ease of administration for patients in order to target a larger audience
- The platform designed for patients makes it easy for them to get used to and focus on their cognitive training

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