

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

Pratyay Pandey, Showmen Talukder, Jonathan Ma, Shashank Sastry,
Daniel Zhu, Bryan Ambrose, Harsh Gurnani
Principal Investigator: Sahar Jahanikia, Co-Advisor: Robert Downing



ABSTRACT

Methods of CBCT/CBCR (Computer-based Cognitive Training/Rehabilitation or Brain-Care) and music therapy have shown effectiveness as a means of positive intervention for geriatric groups of Alzheimer's 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 a mnemonic address reminder system have proven to minimize symptoms such as topographical disorientation. Alongside CBCT will be music therapy, whose interpretation as Karaoke has improved psychomotor speed in the target demographic. The combined power of these techniques would produce an unprecedented level of amelioration, introducing the possibility of a better life for more than 50 million dementia patients worldwide.

INTRODUCTION

- CBCT/CBCR (Computer-based Cognitive Training/Rehabilitation or Brain-Care) and music therapy have shown positive influence on geriatric groups of Alzheimer's dementia patients, resulting in:
 - Mental state and quality of life improvements
 - Decreases in patients' Clinical Dementia Rating
 - Improved short term memory
- A dedicated app for cognitive training would be helpful for Alzheimer's patients, who have currently not had large-scale access to such technology
- As dementia and Alzheimer's get rapidly more prevalent, a commercial app would be more accessible than proprietary technologies that hospitals may use
- There is a lack of medical breakthroughs towards Alzheimer's and dementia, making it imperative to use technologies that have currently shown promise

TECHNOLOGIES



Flutter & Dart

Flutter is a software development kit that utilizes the Dart programming language. It offers:

- 1) Cross-platform development with one codebase
- 2) This includes iOS, Android, and Web
- 3) A vast ecosystem of secure, easy-to-use plugins and technology
- 4) Many were developed by Google, the creator of Flutter and Dart

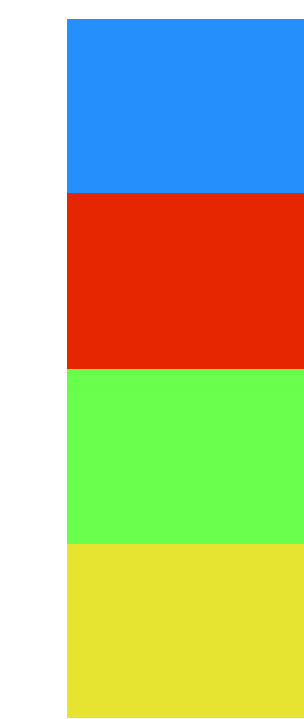
Overall, it allows for a speedy development of our prototype.



MySQL

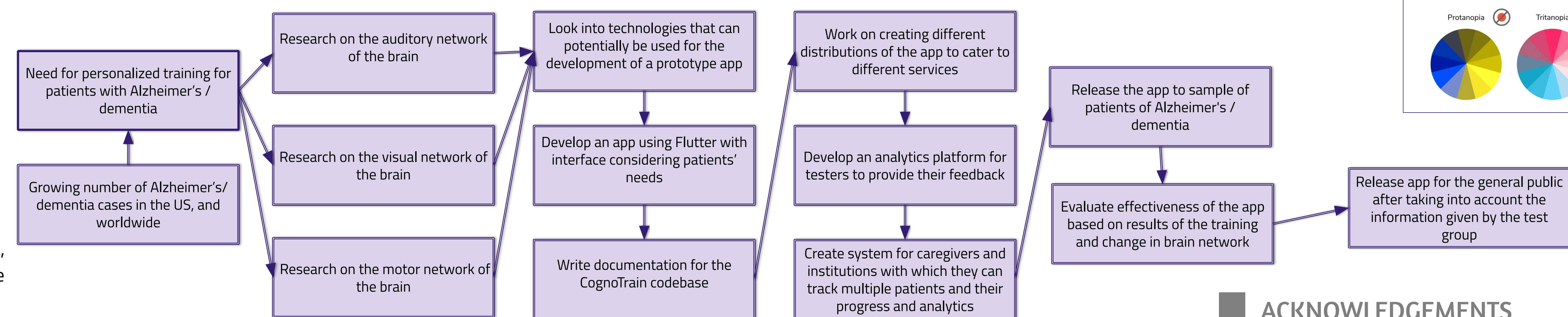
- 1) Relational database used to store user data, including personal information and images
- 2) Utilizes the SQL query language in order to manage data from the database
- 3) Mature community and support

RESULTS



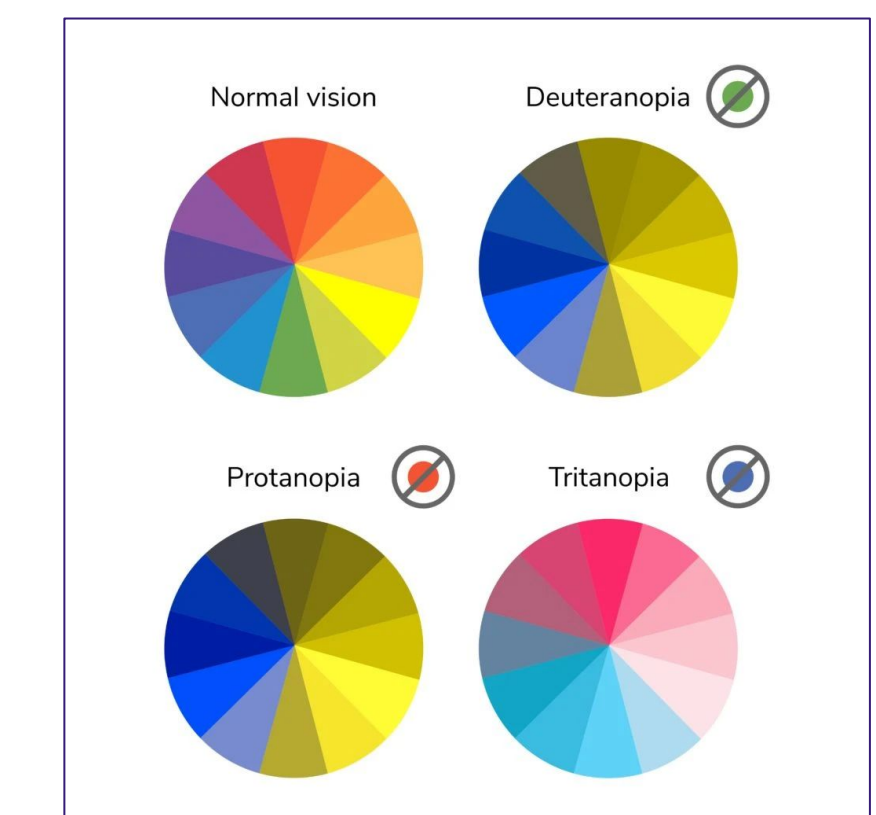
Color	Psychological Meaning	Hex Code
Blue	Quietude/Membership	#198CFF
Red	Excitement/Activity	#E62600
Green	Steadiness	#6AFF4D
Yellow	Openness	#E6E600

- 1) Developed the home screen, user settings, and numerous activity pages
 - a) Targeted various networks of the brain such as visual and motor
- 2) Considered user interface with patient in mind
 - a) Integrated color research to enhance feelings correlating to the given colors



FUTURE DIRECTIONS

- As we scale the app, new features will be integrated, allowing for a more holistic and comprehensive platform
- UI designs are being created to incorporate color-blindness
- Ability for each patient to customize the app to their preferences and requirements will be added
- The idea for a chatbot so that the patients may interact more naturally with the app is in development
- A caretaker database may be constructed so that hospitals and other institutions may view progress and provide further care to patients
- We will seek out sponsorships from non-profit organizations to communicate our product and provide us with the resources required for future development



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CONCLUSION

- A computer-based training app has been proven to be effective in targeting patients of Alzheimer's and dementia as cases grow
 - Successful as per many studies conducted and referenced
- Utilizing an app can increase accessibility and overall ease for patients in order to target a larger audience of patients
- The platform designed for patients makes it easy for them to get used to and have focus on their cognitive training

METHODOLOGY

- Conduct research on the needs of patients with early stage Alzheimer's/dementia
- Design a personalized platform that can meet these needs
 - The platform should be able to train patients with activities targeting each major brain network: auditory, visual, and motor
- 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

