Mobile Game Apps for Dementia Diagnosis and Preventive Training (CM3-16)

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Project Frame
With the dramatic increase in average life expectancy in recent decades, the 60+ age group becomes larger. Dementia has seen huge increase in number of diagnosis per year. Due to the limited medical support in this field and high failure rate in correct diagnosis of dementia, scientists have turned to brain training in attempts to prevent and treat dementia.

Though many brain training mobile applications can be found in the market, these apps lack professional diagnosis. We propose an android mobile app prototype that combines Montreal Cognitive Assessment (MoCA) diagnostic metrics and preventive brain training games with cloud sharing of data.

Objectives
1) To create a digitalized version of MoCA test, allowing people to do the test anywhere anytime
2) To obtain gaming analytics and test results for individual monitoring and research purpose
3) To create an elderly-friendly interface that is easy to use
4) To raise awareness and attention towards Dementia

Flowchart of the Application

Methodology
- Android Studio
- Integrated Development Environment (IDE) for Android application development
- IntelliJ IDEA based
- Google Cloud Platform
- Create and deploy a backend for Android app
- Use services such as Google Cloud End Points and project modules specially designed for Google App Engine

Application Interface

Implementation
The project is a prototype of a platform of which brain training games, and a digitalized version of MoCA Test, a dementia diagnostic test. It includes an app backend of a database that stores all the test results and game results of the users, which can then be accessed through the app by the users as well as the app administrators or even medical service providers through a webpage.

Conclusion
This application prototype aims at demonstrating how incorporating both the MoCA test and brain training can help to diagnose and prevent dementia and reduce the burden in medical support, caregivers, and even the expenditure in social health care. In short term, the collected data of users’ cognitive performance allows individuals and social welfare organizations to understand the continuous performance of the users. In the long run, these data provide valuable materials for brain degeneration research and eventually make a significant contribution to the community.