UF COGNITIVE TRAINER

A Native Android Mobile Application for Cognitive Neuroscience

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CIS 4914 Senior Project – Presentation #1

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II. - SUMMARY:

- **I. - MOTIVATION:**
  - **A) UF Purpose and Goals:**
    - Fulfills UF McKnight Brain Institute's needs for an N-Back style cognitive neuro-trainer via a native Android mobile application
    - This project allows clinical research trial patients the ability to have their inventories tested and logged in an interactive native mobile application environment
    - Provides testing of alcoholism-related studies in a neutral, safe, non-discriminatory, and fun setting using technology
  - **B) My Professional Goals:**
    - My pharmaceutical background and experience prior to CISE studies at UF
    - My desire to go into a Data Scientist/Data Engineer role post-graduation in Healthcare Analytics
    - This project bridges the gap between my two backgrounds in pharmacy practice and research, and CISE
- **II. – PROBLEM:**
  - To write and implement a series of N-Back style Cognitive Training tests into a native Android mobile application for UF McKnight Brain Institute in Dr. Ben Lewis and Dr. Juan Gilbert's laboratories
- **III. – SOLUTION:**
  - I serve as the Lead Software Engineer on this project, via development of my own N-Back style cognitive training tests implemented in a native Android mobile application

III. – PROJECT PLAN:

TIME INTERVAL	PROJECT TASKS
Week #1	Literature Search; Project Planning Document
Week #2	Literature Search; Project Planning Document
Week #3	Evaluate Literature
Week #4	Menu System Initial Build
Week #5	Menu System Initial Build
Week #6	Code N-Back Test (Initial Build)
Week #7	Code N-Back Test (Initial Build)

TIME INTERVAL	PROJECT TASKS
Week #8	Code N-Back Test (Initial Build); Classroom Presentation #1
Week #9	Code N-Back Test (Initial Build); Presentation #1
Week #10	Code N-Back Test; Debugging; Retrofit to Menu System
Week #11	Code N-Back Test; Debugging; Retrofit to Menu System
Week #12	Code N-Back Test; Debugging; Retrofit to Menu System
Weeks #13-14	Final Debugging Stages; Project Pilot Demo
Week #15-16	Final Debugging Stages; Classroom Presentation #2

IV. - LITERATURE SOURCES:

- **Resources Planned to Use:**
  - **1) Dr. Ben Lewis - Original Source Code for N-Back testing in Python:**
    - Original source was developed in Python
    - Posted in Ben Lewis' GitHub Repository: https://github.com/BLewis42/dualNback.git
  - **2) BrainTurk - Dual N-Back Trainer:**
    - Source: https://www.brainturk.com/dual-n-back
  - **3) CognitiveFun - N-Back Working Memory Test:**
    - Source: http://www.cognitivefun.net/test/4

V. - PROBLEMS ENCOUNTERED WITH SOLUTIONS

- **A) Technical Problems (to date):**
  - **1) 01/21/2019 - Need Assistance From UF Digital Arts & Sciences Student to Create Mobile Application Artwork:**
    - Better graphic design of Menu System in Android Studio
    - Solution: I will focus less on graphics of Menu System and more on functionality
    - Future students in DAS joining this project will emphasize artwork of Menu System
  - **2) Possible Technical Issues in Future:**
    - Binding of C++ source code via JNI in Android Studio (potential issues?)
    - Expansion and implementation of second and third N-Back tests in my code (potential issues?)
- **B) Communication Issues:**
  - **02/19/2019 - Technology Issue with Contacting Project Supervisor (Dr. Ben Lewis):**
    - Late to 3:00 PM EST meeting
    - Conducted meeting by telephone on 02/19/2019 at 3:59 PM EST
  - **02/12/2019 - Discussion of Future Meetings:**
    - Discussed holding future meetings via Skype video conferencing (instead of Dr. Lewis' office space)