NSF - Haptic Simulation Design

12/17/2010

Attendees: Christie, Clamann, Gil, Jeon, Kaber, Qin, Swangnetr, Zhu

Meeting Minutes

1. Reviewed current tasks
   1.1. May went over the changes to the Matrix Reasoning instructions. Updated document was provided on January 5. The next step will be to integrate the Block Design, Matrix Reasoning and Complex Figure instructions into a single packet (Biwen, Michael 1/14).
   1.2. The “bounceback” software issue will not be addressed as part of the current development effort. The BD instructions will be revised to advise subjects of the issue.
   1.3. Linus briefly reviewed the existing VR-BD software issues. It was decided that the software platforms are sufficient to move forward with the pilot test.

2. Project updates
   2.1. A pilot test to include the three tests and the basic VR condition needs to be completed by the end of the holiday break, and a second pilot should be scheduled soon thereafter (1/7).
   2.2. Staff for the data collection are as follows:
       • Janet and Zeno – Testing
       • Biwen and Michael - Therapy
   2.3. Report for the current experiment needs to be complete by 5/15, which means data collection must be completed by 4/1 to allow time for analysis and writing.
   2.4. A Google Calendar needs to be set up to schedule staff and subjects (1/14).
   2.5. It was confirmed that 50% of the subjects will be exposed to fMRI testing at the Durham VA.
   2.6. The team agreed that the Block Design rules need to be updated so no demonstration is included after the 1st trial (i.e., eliminate Design 3). This design is for instructional purposes and is not necessary after the initial presentation.
   2.7. Linus, Caesar and Biwen have been reviewing the complex figure scoring algorithm and have participated in detailed review sessions with Dr. Tupler and Yingjie. The results, drafted by Caesar, appear on the following pages. The team will need to go over outstanding issues from the meetings at the next meeting.

Content of December 19 meeting (Yingjie, Biwen, Caesar)

Caesar_version

Previous Problem:
• difference between system scored ROCF and Dr. Tupler scored ROCF(17 vs 30)
• some segments are hard to be recognized and scored
we don’t know what parameters should be adjusted and how to adjust them

key points:

● The sample ROCF shown in the screen should be of the same size as the paper based sample. Yingjie did the coding and demonstration on her own laptop, which means the transforming rate is set according to her laptop. Therefore, before the ROCF test, we should make sure which certain screen we will use and set the sample according to the screen’s resolution and size.

● Recognizing is the most important step. Before the ROCF is scored, we have to make sure every unit is correctly recognized. Some segments are hard to recognize and there are two methods to fix that. The first one is to draw an assistant line instead of system generated line. The second is to talk to Dr. Tupler when the drawing is really weird and then adjust the threshold as Dr Tupler suggests.

● Yingjie uses only one universal threshold for the all the 18 units which may introduce errors. The better way is to set threshold for each individual unit and then adjust them according to Dr Tupler’s suggestion. We do need to discuss about the scores under different situations with Dr Tupler.

● Other detailed problem:

1. How to set the threshold for the diamond. It’s not as easy as a horizontal line or vertical line. How to define the included angle is a problem.
2. Unit 11—the circle with 3 points is easily recognized by OpenCv. However, if the drawing is not like a circle but a square or other shape, how to score the unit is a problem. We cannot score a rectangle as circle only if the system recognizes it.
3. How to set the threshold of the distance between two lines. If it’s set too large, two lines could be recognized as one. However, if it’s small, when somebody tries to draw twice at the same position to strengthen one line, the line could be recognized as two.
4. If the tester draws arcs instead of lines, how to recognize and score the unit. If the arcs are at the correct position, how to score them.
5. As some lines will intersect at certain points, when the tester fails to draw them correctly, small triangles or weird shapes will be generated. How to define each segment, how to recognize them and how to score the newly generated stuffs are topics we should discuss about.

Summary:

● Recalculate the mapping rate from the paper based ROCF sample to the sample in the screen.
● Talk to Dr. Tupler about different situations to adjust the thresholds, including limit conditions.
● Revise the algorithms of recognizing and scoring according to Dr. Tupler’s suggestion.