Haptic Simulation Design for Motor Rehabilitation and Fine Motor Skill Training

Report Outline

Objective (Michael)

Recalls the purpose of the study as indicated in the proposal, but adds that this was a preliminary study for the broader project.

Literature review (Michael, Biwen, Guk-ho)

Literature review for motor skill rehabilitation with block design and matrix reasoning tests, haptic simulation in VR, learning analysis, etc.

Equipment (Michael)

Description of the hardware and software needed for the 4 motor skill test and motivation for why they were chosen.

Motivation for the current haptic VR design (not including the task description, which is covered in Experiment Scenarios)

Subjects (Michael)

Overview of subject demographics, including reference to Edinburgh Handedness Inventory.

Context and users (Biwen)

Brief description of whom we recruited, including motivation for use of the non-dominant hand to simulate impairment and how this relates to the target population (Veterans with a TBI history).

Experiment settings (Michael)

High-level summary of experiment design (integration of Pre-test, training, and post-test)

Task and dependent variables (Biwen)

Experiment scenarios (Michael)

Detailed description of the experiment tests and the three VR conditions

Experiment procedures (Michael)

A brief outline of the procedures followed by the experimenters

Experimental design (Gukho, Biwen; see below)

Review and correct the hypothesis included in last year’s year-end report as needed (Gukho):
“We hypothesized subject test scores would improve in general, as a result of completing any of the three training conditions. Basic VR training was not expected to exceed traditional physical task training in improving subject motor skills due to the fact that no additional aiding was developed as part of the VR presentation. However, the augmented VR condition was expected to lead to improved performance to the haptic enhancements developed beyond the constraints of the traditional training.”

Provide an overview of the data analysis methods used (Biwen)

Results (Biwen, Janet, Zeno)

Detailed review of the results, as presented during the Friday meetings, including pre and post test differences for all three tests, learning data for the training trials, and the subjective workload measure. Do not interpret results in this section. This section should follow a journal article format.

Discussion

An explanation of what the results mean and why they are important.

Conclusion (Michael, Gukho)