CS352 HCI Project:

Navigating the Virtual Environment Using Microsoft Kinect

Usability Test Plan

Xiaochen Yang   Lichuan Pan

HONOR CODE

We, Xiaochen Yang and Lichuan Pan, pledge our honor that we have neither given nor received aid on this work.

HYPOTHESIS TO BE EVALUATED

Via the usability test with users we plan to achieve follow objectives,

Objectives --- Objectives for the test plan are

1. To check if users will like our VE navigation system since it targets in game area.
2. To identify if our current implementation satisfies users' inclinations.
3. To get more user opinions about our system and then we can further improve it.

Hypothesis --- The hypothesis to be tested via this usability test.

Using range sensors, with a very short period of development time and with reusable software applications, the system can recognize human gestures and further achieve hands-free control of electronic devices, and users will enjoy such kind of hi-tech applications and feel refreshing after used it.

PARTICIPANTS

Test Participants --- 5 TAs in the TA office Room 385 in FGH will be the participants since the lab installed with the HMD in FGH 202 has tight schedule and we conveniently set up the Kinect in the TA office to finish our test tasks (and we will explain the situation why there is no HMD to the participants). These TAs are all graduate students in EECS department and they are our officemates.

They should have following skills, experience, and characteristics:

- Various levels of experience in hi-tech.
- No specific gender or age.
- Willingness to help us with our project implementation.
- Normal behaviors.

- No specific requirements to us.
- Willingness and enthusiasm to freely give opinions about good and bad features of the software being used and tasks being performed

Compensation --- no compensation since this a course project without funding and the test won't take much time (possibly about 10 minutes for each participant) and effort.

EXPERIMENTAL DESIGN

The design of the experiment is a within subject design.

Independent variables (objective) --- We will categorize the participants according to the following independent variables:

- Kinect experience, knowledge of VE and hi-tech experience of participants.
- Behaviors --- normal generally.
- Handedness --- right, left.
- Gender --- male, female.
- Age range.

Dependent variables (subjective) --- Quantitative performance measures for the validation testing will include some or all of the following:

- Time needed to complete calibration, both WALK and FLY.
- Time needed for participants to feel comfortable with our system.
- Time needed for participants to enjoy our system.
- Time needed for participants to have opinions to our system.

DATA COLLECTION

Sources of data --- The sources of data for usability test are:

- Keep notes of participants' completing two modes of VE navigation and freely conversing between them.
- Background demographic questionnaires.

Data topics --- The data collection topics will include:

- Time for completing the calibration for each participant.
- Time for each participant knowing how to navigate the VE.
- Time for each participant beginning to like our system.

DATA ANALYSIS

Purpose --- The purpose of data analysis is to determine the time each user getting to know how to use the system. And depends on their experience and feedback, we can keep improving the system.

Activities --- Data analysis activities are:

- Compile the times for each participant getting familiar with the system.
- Gather the feedback and suggestions of the participants.
- Compare users' previous experience with their current experience of using the system.

TRAINING GUIDE

General Description: This section will be used to show the participants how to navigate in the virtual environment.

1. Present the specific area in front of the Kinect.
2. Provide the head-mounted display.
3. Demonstrate how to walk in the place and turn around.
4. Show a superman pose to change to fly mode.
5. Introduce how to use right arm to control flying.

QUESTIONNAIRES TO BE ANSWERED BY THE PARTICIPANTS

(Please see Appendix)

PROJECT SCHEDULE

For the whole project, since obviously the gesture recognition is divided into two modes: WALK and FLY, and these two modes are assessed as same level of workload. Xiaochen Yang will work on the codes of the WALK recognition and Lichuan Pan will work on the FLY. The whole code development will start from the second week of September 2013 and will be finished by October 2013 and the code evaluation will be finished by November 2013. Below are the steps to finish the project (change the week plan to exact dates).

Steps for the design and prototype:

1. Hardware and software environment Setup, 09/07 - 09/14/2013

2. Software work flow and initialization for the project, 09/15 - 09/21/2013

3. Coding the gesture recognition, 09/22 - 10/12/2013

4. Interface design and integration of WALK and FLY, 10/13 – 10/19/2013

5. Finish the prototype, 10/20 – 10/26/2013

Steps for Evaluation:

1. Come up with several tasks, several sets of gestures including WALKs and FLYs, to test the prototype, 10/27 – 11/16/2013

2. Finalize software development of the project, 11/17 – 11/23/2013

Appendix: Navigate the virtual environment questionnaire

What's your identification?

- ○ Undergraduate
- ○ Graduate
- ○ Faculty
- ○ Other

What's your gender?

- ○ Male
- ○ Female

What's your age range?

- ○ 1-10
- ○ 10-20
- ○ 20-30
- ○ 30-40
- ○ 40-50
- ○ Above 50

Have you ever played Video/PC game?

- ○ Yes

- o ○ No

When is the last time you play Video/PC game?

- o ○ Several years ago
- o ○ Several months ago
- o ○ Several days ago
- o ○ Today
- o ○ Never play
- o ○ I can't remember

What do you think the system's capability to enable you to navigate a virtual environment?

- o ○ Very good
- o ○ Good
- o ○ Just so so
- o ○ Not good
- o ○ Bad
- o ○ Very bad
- o ○ I don't know

Do you feel confused when you are operating the system?

- o ○ Yes, very much
- o ○ Yes, a little bit
- o ○ No, not very much
- o ○ No, not at all
- o ○ I don't know

How do you evaluate the walking mode?

- o ○ Very good
- o ○ Good
- o ○ Just so so
- o ○ Not good
- o ○ Bad

- ○   Very bad
- ○   I don't know

Do you have any comments or suggestions to improve the walking mode?

How do you evaluate the fly mode?

- ○   Very good
- ○   Good
- ○   Just so so
- ○   Not good
- ○   Bad
- ○   Very bad
- ○   I don't know

Are you comfortable when you are flying in the virtual environment?

- ○   Yes, very much
- ○   Yes, a little bit
- ○   No, not very comfortable
- ○   No, I'm not comfortable
- ○   No, I feel dizzy
- ○   I don't know

Do you have any comments or suggestions to improve the flying mode?

How do you evaluate the whole system?

- ○   Very good
- ○   Good
- ○   Just so so
- ○   Not good
- ○   Bad
- ○   Very bad
- ○   I don't know

Do you have any comments or suggestions to improve the whole system?