The Ghost Anatomy Project

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Users

To test the high-fidelity prototype and diagnose further design problems, two anatomy students who had never been exposed to the project or interface were selected. Both students, Rebecca and Susan, were in graduate school for a medical-related field, and had taken intense anatomy courses in their studies. Both were students at the University of Washington.

User Testing Method

Both users were tested at a local library with minimal distractions and a quiet work area. The high-fidelity prototype consisted of two parts: one to test the gestures, and one to test the user interface. The gestures were tested with a Leap Motion web prototype, and the user interface was tested with video simulations. Each user tested each part consecutively during their testing session. Users were compensated with candy.

The Leap Motion gestures were tested with a coded prototype built in JavaScript with the Leap Motion API and three.js Library. Existing tutorial code for Leap Motion gestures, and examples from Robbie Tilton's Reflective Prism demo were used to hack the prototype together. The gestures tested on the interactive demo were rotation, zoom, and pointing.

To test the sanity of the menu options, users were asked to interact with videos mirroring actions of the interface. The user would point to the screen, as if it were the 3D interface, while the tester moved the mouse to act as the system. The user would be guided through a set script carefully planned with the video. The video would reflect the ideal actions that would be performed by the user. While one tester guided the user and acted as the system, the other tester took notes or recorded the testing session.

Gesture Prototype:
http://students.washington.edu/tedtag/capstone/Ghost%20Anatomy%20Demo/examples/_index.html

UI Prototype:
https://www.youtube.com/watch?v=fFgP5SK7nc0

User Testing Script

Testing Intro

- This is a prototype of a 3D application to assist in anatomy education
- Fakes holography and will look like this http://robbietilton.com/demos/reflectivePrism/
- Uses fingers and hand gestures
    - o Moving finger around for cursor
    - o Left hand finger + Right hand swipe = rotate body
    - o Groping = peeling off a body layer
- Testing the interactions of the interface today
- Think aloud, be honest
- Mistakes are our fault

Task 1: Examine the Human Body (Ted's Interactive Head Demo)

- Task goal: look at the human body, rotate it, zoom in/out of body parts on the current layer
- *Say you are studying the human ear this week, and would like to take a look at the structure of the ear. How would you do that?*
    - o http://students.washington.edu/tedtag/capstone/Ghost%20Anatomy%20Demo/exampl es/_index.html
    - o Hopefully, they zoom and rotate

Task 2: Examine a Specific Body Part (Alyssa's Video)

- Task goal: look at a specific part inside the body by stripping off layers, zoom into a section and remove layers which float around in space, put layers back if wanted, layers are transparent if they don't fit in the full zoom window
- *Say you'd like to take a closer look at the left lobe of the brain. You can take off layers of the body by system in this application. How do you think you would do that?*
    - o Play the video
    - o Take off layers until brain is reached
    - o Rotate head to get better look at left lobe

Task 3: Finding Information for a Body Part (Alyssa's Video)

- Task goal: see if they can use the highlight/naming features ok
- *Say you don't know the name of this muscle (point to the shoulder muscle). How do you think you'd find out?*
    - o Play the video

Task 4: Take a Quiz (Complex)

- Task goal: body flashcards, select a body part to see the name, change it to red if you got the name wrong, change it to green if you got it right?
- *You have a test on Thursday and need to study. This application has a quizzing app you can use.*
- *Would you be likely to use the quizzing app?*
- *How would you open the quizzing function and use it to study?*
    - o Point of this: to see if users can get to the quiz using the menu that we have, to see if the quiz is easy to figure out, to see if the flashcard-style quiz is even useful

User Testing Notes

Part 1

- swipe and rotate is not as sensitive as she thought
- tried to slowly swipe but Leap didn't sense it
- user doesn't know that they are required to swipe fast
- will be nice to have an indicator of how much the user is zooming in (eg. 50%)
- ideally take a particular part out and rotate it
- Not sure where she is taping (not sure how deep she should poke)
- she used two hands to try to rotate it so it didn't work from in the beginning
- swipe (rotate) didn't work in the beginning either because motion wasn't fast enough
- Rotate is not sensitive enough
- she wants to be able to pick up the scalp

Part 2

Taking a look at the Left Lump of the brain

- Hover over the area, and try to remove by groping
- Wouldn't mind groping forever
    - Prefers a one-motion shortcut
- Search and Select function!!!!!!!!!!!!

Highlighting

- Depends on the system
- For example: For the Skeletal System, she would highlight multiple areas that she would like to work on later (Bookmarking System)
- Since there's a highlight key, she would click the highlight key and highlight whatever

Labels

- "Is there a way to turn them off and on?"
- There would be a "Labels" function to toggle the views

Quiz Function

- Would be nice to have a Customized Quiz with parts that you're having trouble on
- Part of it is identification
    - Highlight a part, and ask "What is that?"
    - …for certain systems like muscles, we'd need origin, insertion, action
    - Where the part originates from, what it inserts to, and what does it do?
- To personalize, would be nice to concentrate on a particular system
- E.G. Just Cardiovascular, since you'd only work on a specific system a quarter
- One system at a time is fine
- Select it and see label

Other Notes

- Use actual cadavers to study
  - Have access Mon - Fri, 8:00 AM to 5:00 PM
- Seems very straightforward, good basic interface
- Highlight is ambiguous because the term "Highlight" was not clear
- Would be nice to have a sidebar that would list everything that's visible
  - Perhaps utilize the extra space on the television
- For rotate button idea is nice; wouldn't want to swipe so much

Design Recommendations

After testing users on the gestures and UI of the interface, several main issues need to be revised in the prototype before the final specifications are drawn for the Ghost Anatomy Project. Users struggled with the harsh rotation gesture, which took an enormous amount of effort and precision to get working. The rotation gesture should definitely be a lot smoother, and more natural to control. Swift interactions, and shortcuts were asked for by the users as well. For example, Rebecca asked for a one-motion shortcut to search for and select body parts. Most users had to be told how gestures worked in order to interact with the interface. Some way to explain the gestures to the user, or indicate the gestures with affordances in the interface, would be most beneficial.

The user interface could also be improved to better suit the users. Users did not notice the menu, and did not look to it to perform functions during testing, such as turning labeling on or off. Both asked for a visible zoom indicator. Since the UI interactions were only simulated, the exact gestures and interactions with the UI will have to be tested and refined as the actual interface is built.