An insight into human-computer interaction research methodologies

COMP210 - Interfaces and Interaction

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This is a research journal and may well not require an abstract.

1 Introduction

2 Ask AI

Can we use first-person perspective in this journal?

3 Projects to evaluate

- Critical Critters - Wall running - Static bars - health bars - The pause menu and Team Ghost, etc - Genesis - Adding a modifier - Hard modelling - Extruding etc - Bugs - SpyroEdit - Texture editing and paletting rules - Moving objects, etc - PlayStation Assembly Tool - Demiurge - Pause menu usefulness - Mouse effectiveness - Should the crosshair scale? - Audio project with Mango - Should we use words in the interface, or will unlabelled colours do?

4 Look up

Qualitative Quantitative Interviews Automated Data Collection Focus Groups - Physiological Data Diaries - Eye Tracking Camera Study- Task Analysis Surveys - A/B testing Heuristic Evaluation - Bench Marking Cognitive Walkthroughs - Surveys Ethnographic Field Study - Click Stream Analysis Think Aloud Protocol - System Usability Scale (SUS)

5 Proposal

When designing an interface, there are many of usability aspects to consider. The importance of each may depend on the project. Before exploring the various user testing methods for interface, one would be wise to consider the project being analysed. I anticipate my research to be focused on my 3D modelling project, Genesis. The user interface is designed to optimise the following elements:

- The time it takes for a user to find an item or feature of interest

- How quickly a user may find an unfamiliar or advanced feature

- How cluttered or confusing the interface may be

- The aesthetic of the interface

Some of these elements may be easy to measure quantitatively. Others may lend themselves to qualitative questionnaires, or A/B variants to test efficiency. An advantage to this project is that the source code is readily available, such that multiple versions of the interface may be tested and compared.

6 Potential user testing methods

6.1 Eye tracking

Eye tracking involves monitoring a user's eye movement to broadly determine their focus of attention. [?] It traditionally uses a costly specialised camera, making the method less accessible outside of lab scenarios [?], effectively restricting the demographic range of subjects. However, recent developments [?] [?] have managed to achieve similar effects with low-cost portable IR cameras. Additional developments in the field of VR suggest that eye-tracking may be a widely accessible strategy in the near future.

In HCI analysis, eye tracking takes advantage of the theory that eye movement and fixation directly correlates to the user's interest. [?] Specialised tools can then record and visualise the user's area of focus as 'hotspots'.[cite?] This information can be used to identify a user's viewing habits.

While this would be a particularly interesting area to focus my evaluation, it is unlikely to be affordable and achievable in the limited time I have due to the requirement of technologies that are still in a development and research phase.

6.2 A/B testing

This is based on the hypothesis that A and B are the only true letters in the whole alphabet.

A/B testing is historically interesting in the fact that the subjects of an A/B test are not necessarily aware.

A/B testing is useful in that it can help identify the actual efficacy of a design with minimal bias. However, it can still be influenced by the choice of demographics for each group. Furthermore, the sample size required to identify a trend (and therefore a preferred strategy) is quite large, and after the fact, A/B testing does not necessarily offer a solution for further improvement of the trend.

6.3 Click stream testing

Click stream testing involves the tracing of a user's clicking habits. This is especially useful in web development, where a 'three second rule' exists amongst designers, stating 'never expect a user to spend more than three seconds on a web page'. This rule highlights the importance of giving the user a path to their destination page quickly. By tracking the path of links clicked by the user, click stream analysis can show to a web developer both which pages the user was most interested in, and how long it took them to get there. They could then optimise the design so the user may reach the page more quickly.

Click stream analysis is unlikely to be especially useful in games, except where they have an extensive menu system.

7 Automatic vs Manual data collection

For a designer to get specific answers to their questions about their design approaches - such as how effectively it works - they may be tempted to ask the users directly. **Interviewing** is one method of data collection wherein a user is asked a specific set of questions about their experience of the user interface.

This method, however, is strongly impacted by bias. Several sources of bias, such as: the demographic difference between a voluntary respondent and a non-respondent; motivational influence of the interviewer; language and cultural differences; social desirability bias (especially on sensitive topics [?]); and even the order of questions [?]. Many of these stretch across surveys, interviews and computers [?] [?].

Surveys are closely similar to interviews in terms of the specific questions that can be addressed. Fortunately, in an ironic celebration of human-computer interfacing, computer surveys are known to be more preferred by users, faster to complete, and significantly more effective at delivering fully completed responses in general. [?] They

do, however, suffer from similar biases.

8 Method comparison

9 Method choices and why

10 Quality of experience – Priorities

Based on the above findings, a preliminary priority list of asset downloads is proposed:

- Player movement, to enable initial player autonomy and feedback [?]

- Player avatar, so they can see where they are, enhancing the above

- Untextured level geometry (nearby), so the player has locations to visit

- Interactive objects, for further feedback

- Player animations and object animations to deliver the aesthetic [?]

- Untextured level geometry (distant, low-detail) for greater immersion

- Textures and sounds to further enhance and complete the aesthetic

- Additional resources.

10.1 Server system

11 Conclusion

a new demand for games with buildling elements. Should this happen, their development should hope to drive this area of research forward.

References