

Cognitive Constraints in Navigational Design: From Psychology to Software as presented by Susanne Jul

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Abstract

Human Computer Interaction is an often overlooked but very important area of study. Computer scientists often leave this work to the psychologists, while psychologists are ill-prepared to shoulder the burden of the problem alone. People like Susanne Jul are needed to bridge this gap and do the work that society needs.

1 Introduction

Susanne Jul introduces the problems concerned with environmental locomotion design in support of wayfinding. One of her basic hypothesis is that you can reduce cognitive load in wayfinding. Out of the breadth of problems in the field she identifies 12 design constraints for this problem.

2 Locomotion Structure

She presents an interesting structure for how locomotion can be described. The locomotion structure must be a superset of the task defined structure, For example, in a maze we have destinations and routes. She also points out that as the environment gets simpler, the task gets simpler. This seems painfully obvious to me.

3 Jazz*

Jazz is an application framework that offers a 2d multi-scale environment. A multi-scale environment is one in which data is available in multiple levels of detail. For example, you can "drill down" into increasingly fine descriptions of the object. Path++ is another locomotion framework common in the field.

4 Leylines Demo

She presented a demo where the system picks the closest object to zoom to. Having worked extensively with zooming systems for graphics systems (Photoshop, Maya, etc) this is an interesting approach. It is not so applicable to 3 dimensional modeling systems because you often want to go to the "empty space" instead of an object. This model is built up on Voronoi cells.

5 Leylines Findings

Ms. Jul shows that movement time was reduced 33% and mouse activity was reduced about 50 %. This suggests that the participants in the study found it easier to complete their task in the leylines model. Ms. Jul also presented some questionable tables about the cognitive savings that the system offered the user. She did provide the mild warning that this was only a correlation, but I felt her message was clear - she felt there was a cognitive savings. I personally feel that the cognitive savings are not there, it is simply a better navigation system.

6 Desert Fog

Ms. Jul then removes the labels and makes users navigate the space blindly. This experiment shows the most dramatic difference between PAD and Leylines. only 1.5% of PAD tests were successful, whereas Leylines had a 100% success rate. Again, I feel that this is due to the fact that the problem is well suited to

the leylines rather than some amazing cognitive breakthrough.

7 Conclusion

I really liked the topic of discussion. I felt that Professor William's comments were a bit over aggressive and overbearing, but they did lead to some interesting discussion. I strongly believe that more research needs to be conducted in this field.

8 Commentary

Her slides looked a bit dense on average, although the case study map was quite nice. Some of her examples were amusing and proved her points well. I am glad we've finally gotten some non-systems applicants in! I found her area of study much more interesting than the previous applicants. She flipped through a couple of slides too quickly (notably her home-page URL!) She was obviously a bit nervous, but I really liked the presentation. I really liked how she handled all the questions. I am not sure if the faculty asked more questions because of interest in the subject, or out of doubt of validity or material. Her summary was nice.