Wearable Computing

WiSe 07/08
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Problem Sheet 4

Submission Deadline: 07.01.2007

1 Problem

The process of designing user interfaces is a difficult task were different models have already been developed to guide user interface designers. One of these models is the PACT method introduced in the lecture.

a) Describe the PACT method and its properties for designing user interfaces?

1 Point

2 Problem

The GOMS analysis is one of the most widely known theoretical concepts in HCI. In the article "The GOMS Family of User Interface Analysis Techniques: Comparison and Contrast", John and Kieras present a comprehensive discussion and comparison of four popular variants of the GOMS family (Download available at `http://www.cubeos.org/lectures/W/p4/paper1.pdf`).

a) Read and summarize the article in your own words and explain in particular the Keystroke-level model, the original GOMS formulation, NGOMSL, and CPM-GOMS.

b) Compare the PACT method and the GOMS analysis techniques regarding there primary focus. How and where can you apply both methods in a wearable user interface design process? Use a real world example to illustrate your argumentation.

4 Point

3 Problem

Implement an application that provides the possibility of writing text by using only 3 to 10 different keys of an QWERTY keyboard.

Experiment Setup
Record for each person in your work group 4 different data sets by typing the following text:

> MANY CHALLENGES AWAIT WEARABLE DESIGNERS AS THEY BALANCE INNOVATIVE INTERFACES, POWER REQUIREMENTS, NETWORK RESOURCES, AND PRIVACY CONCERNS.

The test sequence should be done in the first series by recording a single data set from each test person. Then, in the second series each of the test persons does the typing two times in a row. Finally, in the last series you repeat the first run of the experiment.
The properties of each data set you record should contain time needed, error rate, and letter correction rate.

a) Explain the concept of your keyboard.

b) Visualize and discuss the experiment results. Can you already draw some conclusions from the data?

4 Points

4 Problem

In problem no. 3 you developed and evaluated a text input application that uses only a limited number of keys regarding usability and learnability issues.

Now, we want to apply the Keystroke-Level model to your application in order to find out more about the time it takes a user to perform the text input with your method. The original paper that introduced the Keystroke-Level mode in detail can be used for further information (Download available at `http://www.cubeos.org/lectures/W/p4/paper2.pdf`).

a) Use the Keystroke-Level model to predict the time it theoretically takes for the task of entering the text given in problem no. 3. Define the task, operators, and method to calculate your time prediction.

b) Compare and discuss the theoretically calculated time prediction values for task performance with actual values you measured while typing the text given in problem no. 3.

5 Point

Note: The submission of problem sheets has to be done by e-mail to hwitt@tzi.de with the following subject:

[Lecture Wearable Computing] Problem Sheet No.{number}. If problems require the implementation of software it has to be submitted along with the problem sheet containing documented source code, compiled binaries, and 2 small scripts (for Windows and Linux) to run the application.