Head gestures in laptop interface

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STATEMENT OF THE PROBLEM
Subject of this paper is to find out if combining head gestures with traditional keyboard touchpad combination will improve laptop usability.

Idea is not to create something new [1] or revolutionize the laptop user experience but rather to improve the little things in day to day [2] use with head gestures and see if it makes the usage better.

RESEARCH QUESTIONS AND/OR HYPOTHESES

• Are head gestures easier to use in certain basic tasks than touch pad and keyboard combination?

• Would people use them?

Hypothesis is that head gestures work better than normal ways of interacting at least when dealing with notifications [3]. If they are easy to use it is possible that people would use them.

METHODS AND PROCEDURES

Testing will be done in one of the class rooms at University of Oulu. Test subjects will be given laptops and a set of tasks they need to complete. Half of the test subjects are given appropriate software, a web camera and prior training on how to use head gestures. Other half will pose as a control group and do the tasks without gestures.

Software includes means to use head gestures [4] and way to record the experiment through the camera and logging software to record touch pad and keyboard use.

Subjects will complete their tasks without anyone else present. Tasks include basic web browsing and text editor usage.

After tests are done data received will be used to calculate the time it took to complete each task and the amount of unintended inputs made during that time.

Subjects also need to fill out a short survey asking about their experience. Survey tries to find out if subjects found the gestures natural and easy to use.

Variables

Measurable variables are time, errors and survey data.

Hardware variables are controlled by giving every participant the same computer and the same task list.

The participants ability to learn and use the gestures will depend on the person but they will be picked from a similar group of people so the difference is limited.

Sampling

We will do an internet survey on university students and professors asking if they like to participate. They will also be asked if they own a laptop, how often they use it and what type of operations they do with it.

From the survey data we will create our sample from people with similar skill levels.

Instrumentation

The experiment will be done with an Acer Aspire 5741G laptop which is running Windows 7 operating system. External keyboard or mouse won’t be used.

Laptop will have the software [4] for head gestures. There will also be software for recording the experiment and a basic text editor (Microsoft Word or Libre office) and several web browsers (Chrome, Internet Explorer, Mozilla Firefox, Safari and Opera).

Web form will be needed for the surveys.

Data collection

Data will be collected with web camera, logging software and a short survey like mentioned above.

Applying survey will consist from following or similar questions: Do you own a laptop? Yes or No. How often do you use it? Daily/Weekly/4-5 times a week/Twice a week/less. What type of operations do you perform with it? Choose all that fit. Coding / Web Browsing / Text editing / Gaming / Reading.

After the test survey will go through every task and ask if the participant though that head gestures worked well in
that task. It will also ask if participant would use these gestures on their personal use.

Time and errors will be calculated from the video and stored to Microsoft Excel for evaluation with the after test survey data..

**Data analysis**

After survey data is used to find out the overall opinion by calculating the mean of each task. That data is used to answer the research question 2(Would people use them?)

Times from the test subjects will be compared to the times from the control group and calculate the difference. From the difference we can make a conclusion that gestures are faster or lower in certain tasks.

Errors made by test subjects and control group will be compared to each other in order to find out if other method causes more errors. If the error amounts are significant on any test done by either group we can make a conclusion that it might not be the best way of doing that particular task.

**LIMITATIONS AND DELIMITATIONS**

Limitations:

Time this test gives to its participants to learn the head gestures might not be long enough.

Using a laptop and/or software that is not familiar to subjects might hinder the results

Getting a proper reading on what people like to use needs a large sample size which might not be possible.

Delimitations:

Not using wide enough scope to find different types of people. This test only focuses on people with certain technical capabilities and are regular laptop users therefore alienating not so technically competent people and not so experienced users.

**SIGNIFICANCE**

This research aims to improve the user experience when dealing with laptops and give a glimpse to the views on people on the subject of head gestures.

This could be useful for laptop and software makers so that they know if people like or dislike this feature and in which type of situations it is a viable option.

**REFERENCES**


