

# Evaluating the Usability of Applications by Eye Tracking

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An important part of software development is properly designed user interface, because poor usability is not tolerated by users who simply choose another application, especially in web applications. Users should be able to interact with application with ease, regardless of level of complexity of the application logic [1]. The best way how to determine level of usability in an application is user testing with real users, because it provides direct information about how people use application and it shows to us problems with the specific interface being tested. There are several usability methods that can be used to obtain data from testing. We can use this data to identify usability problems in interface design and then developers can perform the necessary changes in interface design [3].

On the other hand user testing is time and money consuming, therefore our effort is to obtain as much information as possible from users. Now we can use eye tracking to obtain more information on what draws the attention of users or where the users search for information in application. Eye tracking is technique which record eye movements while user is looking at stimulus. The eye tracking is an appropriate usability testing tool because of eye-mind hypothesis, which infers the link between what a person is looking at and their cognitive activities [2].

We can obtain a large set of data from eye tracking during usability user testing, but an analysis of these data is extremely time consuming, because there has not been established correlation scheme to link eye tracking patterns to specific usability problems [1]. At the present time analysis of patterns is based on subjective opinion and interpretation of individual evaluator. There exist a few studies which try to map eye tracking metrics or patterns to specific usability problems, but at the end they still need experts to analyze results [4].

In our approach, we are trying to design method which will automate process of evaluating data from users testing with eye tracker. We will aim our research on web applications and if it will be successful we can extend our method on other

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applications. We will probably combine eye tracking metrics with other metrics like key or mouse events etc. By this time we do not have chosen a specific type of method, but we cogitate about several potential methods how to automate process of evaluating data from eye tracking. One way is to use eye tracking patterns, which are collected in literature. We will search these patterns in eye tracking data combined with other metrics and then map on specific usability problems. Other approach is to use machine learning to analysis data and extract information about usability problems.

The forthcoming step in our research is to conduct usability test with real users. We will focus on learnability of websites which are daily use by many users like websites of telecommunications operators. We will try to cover users with different characteristics which are relevant to our research. The data will consists of eye tracking data and mouse events or key press events and complemented by post test questionnaire. The design of experiment is only initially and we are working on details of experiment now. The main reason of conducting this experiment is to obtain big set of data on which we can test our theories and methods of automatic evaluation of data from usability tests with eye tracking. Furthermore this data can be useful in other related researches.

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