

Eye tracking in user tests

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Abstract

In user tests, the thinking-aloud technique can be applied to reveal the perceptual and cognitive processes of the participants during task performance. In this paper it is investigated if the less interfering technique of tracking the eye movements of user test participants can yield this type of information, based on the assumption that the point of gaze indicates a participant's current cognitive operation. Trained and naive participants executed various tasks with a digital room thermostat, simulated on a touch screen. Eye movements, all buttons pressed, and the successive display contents were logged. Quantitative, overall analyses of the eye data (e.g., fixation duration and saccade length) showed no systematic differences between the trained and naive groups or between easy and difficult tasks. However, analysis per task and per participant suggested that knowledge about the fixation locations can produce design-relevant insight into task performance that adds to common measures of task performance and action protocols.

Introduction

In consumer product design, one of the options to evaluate the usability of a product or prototype is to perform a user test. Participants of a user test are asked to carry out certain tasks with the product, while their behaviour is observed. Thus, a user test gives the opportunity to study the usage process and to identify ways of use and possible problems. In order to better understand any design flaws the product might have it is important not only to know *what* the user does when performing the tasks but also *why* s/he does it. For successful redesign, or for avoiding old problems in a new product, it is essential to recognise what makes the user expect that this particular action is the next step towards the goal of the current task. Put differently, one would like to know what the user perceives and thinks at any moment during the user test.

A common approach to map these processes is to ask test participants to verbalise what they perceive and think during task performance: the 'thinking-aloud' method. See for instance Ericsson and Simon (1980) and Boren and Ramey (2000). In various usability studies it was concluded that this method can yield useful, design-relevant information (e.g., Bowers & Snyder, 1990; Denning *et al.*, 1990; Jørgensen, 1989; Lewis, 1982). On the other hand, Lewis (1982) listed a number of

In D. de Waard, K.A. Brookhuis, S.M. Sommer, and W.B. Verwey (2003), *Human Factors in the Age of Virtual Reality* (pp. 181 - 191). Maastricht, the Netherlands: Shaker Publishing.