
“Touch me” – Workshop on Tactile User Experience Evaluation Methods

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Abstract

In this workshop we plan to explore the possibilities and challenges of physical objects and materials for evaluating the User Experience (UX) of interactive systems. These objects should face shortfalls of current UX evaluation methods and allow for a qualitative (or even quantitative), playful and holistic evaluation of UX – without interfering with the users’ personal experiences during interaction. This provides a tactile enhancement to a solely visual stimulation as used in classical evaluation methods. The workshop serves as a basis for networking and community building with interested HCI researchers, designers and practitioners and should encourage further development of the field of tactile UX evaluation.

Author Keywords

UX evaluation; Tactile UX evaluation; Evaluation methods

ACM Classification Keywords

H.1.2 User/Machine Systems: Human factor

Goal of the Workshop

The ultimate goal of the workshop and its submitted contributions is the application of physical objects to the tactile evaluation of UX. These objects can be used for qualitative (or even quantitative) user self-reports



Figure 1. Sensual Evaluation Instrument (SEI) objects

during and after evaluations of interactive systems. These playful self-reports capture UX in a holistic way. This kind of evaluation is without too much interference with the users' experiences as in the case of classical methods (e.g. questionnaires, physiological measures).

The workshop is inspired by the approach of the Sensual Evaluation Instrument (SEI) [6] (see Figure 1) and tries to enhance the (often solely verbal and visual) classical methods of UX evaluation in HCI with physical materials and objects. The idea behind tactile UX evaluation methods is that objects are meant to represent dimensions of UX (e.g. arousal). They can consist of various materials and substances such as, but not limited to: clay, wood or metal. Objects can also differ in shape. They are supposed to be chosen by users in UX evaluations (during and after interaction) according to their current, situational "mood" in a self-reported way.

An initial self-developed framework for describing dimensions of materials and objects for tactile UX evaluation is shown in Table 1. With the presented methods we focus on several facets of human perception enabled by human skin: Touch, pressure and pain reception (shape and surface), stretch reception (stickiness) and thermo reception (temperature).

As a contribution to HCI literature, the outcome of this workshop are ideas, challenges, possibilities and a network of interested researchers and developers for developing tactile evaluation methods.

With the skin as the largest human sensory organ, we expect possibilities to capture UX in a more holistic way

than with classical approaches. Furthermore, we hope to foster a playful and lively exchange between users and evaluators and to provide a broad range of valuable data that other methods would not be capable of.

Overview of the Workshop Topic

Classical UX evaluation

The evaluation of UX of users interacting with systems is seen as a "hot topic" in HCI in the last decades [4]. Especially the evaluation of emotions as part of UX has been in focus of research and practice [8]. There are several approaches for the evaluation of UX [12]: Subjective methods rely on self-reports of users such as questionnaires or interviews. Questionnaires can for example contain verbal statements that have to be rated on a quantitative scale. It is also possible to present pictures from which the user can choose according to his/her state. Interviews contain questions with a free-response format and provide qualitative data about UX and emotional factors.

There are also objective methods, such as physiological measures (e.g. galvanic skin response, electromyography, electrocardiograms) or behavior observation (e.g. coding of facial expressions). Particular emotional states (such as happiness, calmness, sadness, boredom, anger etc.) can be mapped on a three dimensional grid: arousal (activation – deactivation), valence/pleasantness (high pleasantness – low pleasantness) and dominance (high dominance – low dominance). It has been proposed that there is a need to "discuss affect measurement beyond the individual level" and go beyond measures such as physiology and (mostly verbal) self-reports [12].

Reception	Realization	Example
Touch, pressure, pain	Shape, surface	Wool, barbed wire
Stretch	Stickiness	Glue
Thermo	Temperature	Fire

Table 1. Initial framework of tactile UX evaluation methods

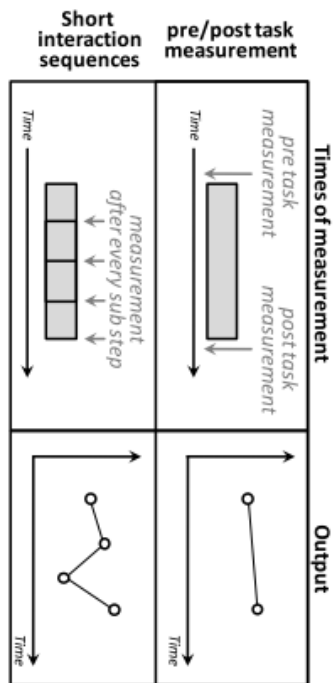


Figure 2. Comparison of interaction sequences with different times of measurement

A well-known approach for measuring emotions by non-verbal pictorial techniques is for example the Self-Assessment Manikin (SAM) [1], a scale that directly measures the dimensions pleasure, arousal and dominance as affective reactions to a stimulus. EmoCards [3] are a non-verbal method for user self-reports of emotional categories. Each emotional category that is represented by an EmoCard consists of a realization on the emotional dimension (e.g. activated and low pleasance or deactivated and high pleasance). Another method is the AffectButton, a digital interactive self-report method with a dynamically changing iconic facial expression [2]. Most known approaches for assessing UX have several shortfalls: Questionnaires or written interviews with verbal statements depend on the user to read and understand text. This method is not adequate for users who are illiterate, dyslexic, blind, have certain cognitive limitations, or have not learned to read yet (e.g. children). Especially questionnaires are often intended to be administered after an interaction (post-interaction questionnaire). However, it has been shown that these approaches do not fully capture a holistic picture of UX and emotion, as these factors vary continuously during an interaction [13]. Figure 2 illustrates the richer output resulting from continuous compared to only pre- and post-task evaluation.

Objective UX evaluation methods such as physiological measures require expensive equipment and are often hard to analyze and to interpret. Some authors also question the fact that these precise evaluation methods can give a holistic image of UX and emotion [1][11]. Solely quantitative measures are not sufficient to

provide really deep insights into UX and emotion, as most of these measures do not “trigger” the users to freely talk about their thoughts and feelings. But: For HCI it is not only important to *describe* the interaction (quantitative), but also to *understand* the interaction (qualitative). Most of these methods interfere with the personal experiences of the user (e.g. questionnaires and physiological measures) and therefore interrupt them in their interaction.

Tactile approaches for assessing UX and emotion

Tactile approaches [10] can be used for more *peripheral* instead of *central* self-reports of users and are supposed to be more natural and less invasive. At the same time they are supposed to be more stimulating than solely verbal or visual approaches. Lottridge [9] has proposed the Emotrace-slider (see Figure 3) to evaluate emotional experiences during the entire interaction process. A highly innovative approach is the Sensual Evaluation Instrument (SEI) [6][5][7], that contains 8 tactile objects (see Figure 1) for evaluating UX and emotional responses to interactive systems. Each of the SEI-objects represents one or more emotional state(s), such as anger, frustration, confusion or calmness. The authors show that the SEI provides valuable insights into UX and emotional experiences of users. Furthermore, it is accepted by users and provides a promising new way for user evaluations of interactive systems. The SEI combines quantitative data (frequencies of chosen objects) with qualitative data (reason for choice of object) and has been (partly) validated with the International Affective Picture System (IAPS) [6] and the EmoCards [13].

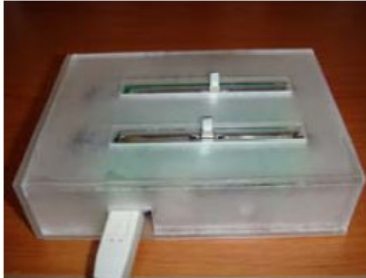


Figure 3. Two-slider Emotrace

With the proposed workshop, we aim at addressing, enhancing and further exploring these approaches by developing, discussing, and expert validating tactile evaluation methods that are suitable for a broad range of user groups.

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