

USERS BECOME RE-CREATORS: ENHANCING EXPERIENCES THROUGH MAPPING

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In this paper, we present a new understanding of interactive installations that goes beyond action-reaction communication between actor and installation. The goal is to enhance the user's experience and engagement as well as the reflection about the creator's initial intention. We employ "Mapping" as method to redefine the user's role from consumer to "re-creator" within a specified scope, set by the creator.

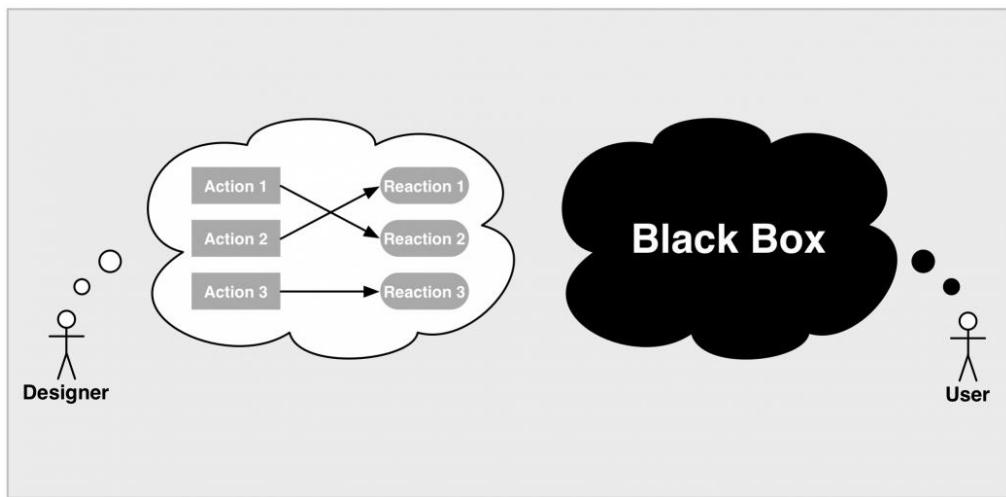


Fig. 1: The designer's and active user's role in traditional interactive media art work.

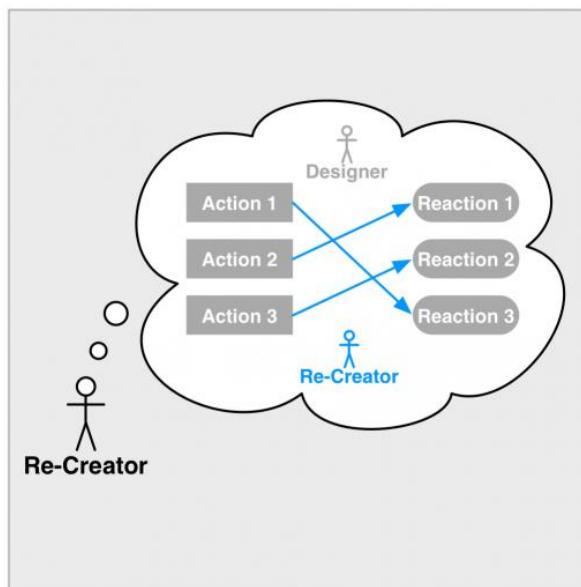


Fig. 2: Dynamic mapping concept - the user become a re-creator.

Introduction

On the crossroads of technology and arts, we consider User Experience Design as a promising approach to empower the design process of media art pieces and ensure the actors' engagement and reflection. We focus on interactive installations as media art pieces; the actor provokes a system's reaction by his actions (e.g. full body movement).

Since most installations only provide a closed action-reaction framework – some employ programmed randomness to include surprising moments – we argue towards a new understanding of the actor's role. The goal is to enhance the user's experience by creating a deeper engagement and immersion on the one side and a reflection process on the other side.

Digital Experience Design

In context of HCI, works like "User Experience with the CYBER graphics terminal" (1974) from Edwards & Kasik have constituted the term user experience for the first time. [1] During the 80s the term was rarely used. In the 90s its popularity started again with the movement of Don Norman ("User Experience Architect"). Since the new millennium, the term user experience is spread through various disciplines in the field of HCI. Hence, the quality of a digital product does not rely on usability only, but also on aspects like aesthetics and emotional bonding. In the near future previously separated disciplines will merge due to the shift from performance- and task-oriented systems to experiences with and through digital products. [2]

Hassenzahl says: „[...] *experience emerges from the intertwined works of perception, action, motivation, emotion, and cognition in dialogue with the world (place, time, people, and objects). It is crucial to view experience as the consequence of the interplay of many different systems. [...] While many processes together produce experience, emotion is at its heart and has an accentuated position. One may go as far as saying that emotion is the very language of experience.*“ [3]

According to this, our understanding of experience is a stream of thinking, acting, feeling, rating and reflecting of external and internal influences. It is an inner self-reflection. An experience is a composition of this stream into a closed and personally meaningful entity. Experiences give our actions meaning, they are remembered, communicated and act as a motivator or de-motivator. It can be named precisely and has a start and end point. As a matter of this, an experience changes over time.

Besides taking a look at experiences on a meta-level, it is also important to take a look at the particular factors that are directly related to our interaction with digital products, because user experience design does not only involve the product, but also the user, their activities and the context in which the interaction takes place. We understand user experience as a symbiosis of these four basic elements. As a matter of this, we extend the term experience design by the word *digital* to *Digital Experience Design* to accentuate the interaction with a digital product. The use of a digital product in contrary to analog products is essential for the general framework of interaction. Therefore we stress on this particular aspect.

The *Digital User Experience* is based on four key aspects: the characteristics of the product, the user, the activities and the context of use. The digital product is characterized by its tangible (pragmatic) and intangible (hedonic) qualities. The appraisal of functionality, performance and usability takes place on an

objective level, whereas beauty, emotion and meaning take place on a subjective level. The user is driven in particular by his intentions (goals), perception, (pre-) knowledge and culture. In this process, self-reflection and perception/cognition takes place. The user evaluates and rates the own acting and the experience as well as compares the current experience with previous ones. Before the user interacts with a product he has expectations of the product (expected experience). This experience will change over time. The user starts with some expectations before the first contact with the product, which he might have gotten from product description, photos/videos or review. During the use, these expectations can be met or not. Based on these experiences new expectations evolve. After the use a first opinion is created and new expectations for future interaction/use arise. Places and spaces, their objects and people (subjects), events and environmental influences (e.g. light and weather) characterize the context of use. An essential factor is the time, because all characteristics of the context and activities depend on it; they can change during the day and over months and years. This does also include the requirements and needs of the user; they also change over time. Consequently, it is only possible to measure the user experience at a given point in time.

In conclusion we can say, that user experience is a dynamic phenomenon, which changes over time and influences or future experiences. The context of use influences the user, the activity and the digital product. Thus, the experience can be influenced for example by poor lighting conditions, that result in reflections on the screen, the activity by tight and crowded places and spaces, and the user can be distracted by high traffic, pedestrians or other objects (e.g. vehicles in road traffic). An activity provides the connection between the digital product, the user and the usage context.

Mapping to enhance experiences and reflexion

to map: to assign (as a set or element) in a mathematical or exact correspondence <map picture elements to video memory> (Source: Merriam-Webster.com) [4]

With the term mapping we refer to the process of assigning a set of controls to a given functionality of an installation to modify the action-reaction principle of an installation. This gives the creator the possibility to enhance the interaction and user experience.

"Interactions are reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence one another." [5] Thus, the user can influence a process and change the systems' behavior. However, the interaction is limited to a set of rules, defined by the creator. Mapping on the other side modifies or enhances these fixed rules of interaction. It makes decisions about if, when, and how to respond to incoming inputs or which channel to use for the response. Additionally mapping is always connected to a certain topic (e.g. movement, sound). It builds in itself a closed entity.

More in general, a distinction can be made between installations in which a continuous mapping of action (input) onto reaction (outputs) is used and installations in which a sort of dialog takes place. These two conditions can be thought as boundaries of a continuum of possible interactions. According to this, we can distinguish two different types of mapping: 1. direct mapping implies some kind of directness in the action-reaction process without any dynamics; 2. indirect mapping includes some kind of logical model or reasoning that selects a reaction-algorithm in correspondence to the current context. Hence the reaction is selected from a collection of possible reactions. Due to this static concept the user experience decreases when the user fully understood the underlying mapping rules.

Therefore we propose to change the role of the actor from an active user to an active re-creator. A re-creator is empowered to manipulate the mapping rules, which allows her/him to reflect on technology, aesthetics and experience. Technology becomes a visible artifact of the installation. Performing the mapping process motivates the re-creator to explore the action-reaction framework and underlying rules. Adding personal meaning enhances the experience even more.

In traditional interactive media art works the designer defines a set of actions and reactions and maps them according to the designer's mental concept (see fig. 1). The user on the other side perceives the installation as a black box. He/she has to figure out how the installation works (action → reaction) and how the designer applied the mapping. With the lack of modifying the mapping, his/her experience of interacting with the installation is decreased. This can lead to one of the following three states: The user gets bored: He/she has figured out the installation's underlying concept and mapping; any further interaction is boring; the interaction time is too limited/short. The user gets unexcited: He/she understands the static installation concept, but its static behavior makes the interaction unexciting. The user gets frustrated: He/she cannot find out or understand the installation's underlying concept and mapping.

By applying dynamic mapping concepts to the interactive media art work, the designer's and user's role are changed (see fig. 2):

The designer still creates a set of actions and reactions, as well as a mapping (as shown in figure 1), but in addition he/she defines certain rules and boundaries. The designer defines the different perspectives of the installation in order to reflect upon its being and purpose. He/she can adjust this experience by defining the boundaries of the mapping. The re-creator exploits the installation and modifies the mapping within the given scope through an additional interface.

However it is always a tightrope walk between level of freedom and level of art. The more mapping is applied, the more the designer divulges the installation to the user. On the other side, the less mapping is applied, the more the installation can focus on a certain aspect.

An Example: Der Schwarm

Some examples of mapping are presented in the installation *Der Schwarm*. [6] A flock of swarming light spots projected on the floor reacts to free body movements. The response of the swarm intelligence to the movement of the interacting user is represented through behavioral patterns. A pattern defines a set of swarm parameters such as movement direction, velocity and graphical representation. Free body movements are tracked and its velocity and position are mapped to the flock's behavioral patterns and position. Quick movements by the user evoke a fleeing or aggressive flock of light spots, while slow movements make the light spots react calm and friendly.

An enhancement of the installation *Der Schwarm* is an auditory display [7] that creates sound, every swarm particle creates a sound. The mapping is realized through the employment of Albert Mehrabian's three-dimensional emotion model (PAD), which has advantageous properties for digital systems and is already been applied to link properties of sound and emotions. [8] [9] Mehrabian's representation oriented system is defined through the axes valence (pleasure vs. displeasure), arousal (arousal vs. non-arousal) and control (dominance vs. submissiveness). [10] At first we mapped three major swarm behavior parameters to the axes of the PAD model. Then we assigned three sound parameters to the axes. The result is one possible mapping of swarm behavior parameters to sound parameters. An interface

enables the user to modify the mapping, so any combination of the three swarm behavior and sound parameters is manually adjustable.

In this example the user becomes a re-creator. S/he is enabled to change the mapping within a defined scope and explore its effects by full body interaction. The re-creator on the one hand can modify the underlying mapping rules and understand the installation's basic idea. The re-creator's empowerment to configure certain functions and manipulate the action-reaction framework of the installation can foster hers/his experience. On the other hand, the designer is enabled to provide restricted insights into his media art pieces. This allows her/him to draw the re-creator's attention to certain parts of the installation to deliver her/his intending message.

Conclusion

In this paper we have proposed a new concept for enhancing the user experience with interactive installations. With the installation *Der Schwarm* we have a proof-of-concept. Applying this approach allows an enhanced experience for the actor and provides new possibilities for the creator to reach the actor. The actor becomes a part of the whole process (not the product). Thus we are not only able to enhance the experience, but also to strengthen the engagement of the user with the installation as well as the immersion and reflection.

References and Notes:

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