Cueing the Past: Designing Embodied Interaction for Everyday Remembering

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Abstract

Inspired by Dourish's view on embodied interaction and his design principles, a concept termed 'What are the odds' was developed in order to explore the possibilities of embodied interaction in storing, retrieving and enriching everyday remembering. Our findings indicate that everyday remembering may be a suitable application area due to its abstract and personal nature.

Keywords

Everyday Remembering, Embodied Interaction, Interaction Design, Autobiographical Memory

ACM Classification Keywords

H.5.2 [User Interface]: Interaction styles, Theory and methods; H.5.m [Miscellaneous]

General Terms

Design

Introduction

Digital recording devices, such as mobile phones and digital cameras, make it possible to digitize our past and present experiences, using various types of media. This results in new questions on how interaction design can re-establish the physical interaction with media in the digital world. Do we want to replace physical actions in the world by virtual representations? As Klemmer et al. [8] argue, "although the digital world

can provide advantages, there is so much benefit in the physical world, that we should take great care before unreflectively replacing it". From that perspective, they specifically state the room for improvisation in action that the physical world offers and cannot be neglected when integrating the physical and the digital world. Dourish [1] preceded this view with his approach on embodiment and embodied interaction where he states that "Embodiment is how these physical and social phenomena unfold in real time and space as part of the world in which we are situated." Specifically focusing on the physical world we live in, embodiment searches to connect that world to the world of digital data.

This paper works towards creating an understanding of how to design for embodied interaction with interactive systems in the context of everyday remembering. Our study speculates on the value of principles of embodied interaction to that specific context.

Embodied Interaction

In his influential book "Where The Action Is", Dourish [1] approaches embodiment as a phenomenon underlying the two trends that have been emerging in the field of human computer interaction (HCI); Tangible and Social computing. Tangible computing integrates physical representations and mechanisms for interactive control into graspable user interfaces [5], while social computing is put forward as an attempt to incorporate the understandings of the social world into interactive systems [1].

The key to developing an embodied interactive system is based on the understanding that not the designer, but the users themselves create and communicate meaning by interacting with the system. This led Dourish to recommend the following design principles concerning embodied interaction [1] into account: *Computation is a medium; Meaning arises on multiple levels; Users, not designers, manage coupling; Embodied technologies participate in the world they represent* and *Embodied interaction turns action into meaning*. There are very few design case studies to our knowledge showing how these principles have been applied in practice. The aim of this paper is therefore to report one, based on the design of tangible interactive technology to support everyday remembering.

Everyday Remembering

Remembering and how human memory works has been studied extensively. The theory on memory we will use is the constructionist approach [2] which was put forward, amongst others, by Freud. The approach describes how the human memory is a constantly adapting system [6], which changes connections between how ideas, concepts, recent events and patterns are stored in the brain. These events can then be reconstructed when parts of them are cued. Such cues can be of different modalities; e.g. visual cues like photos prove to be effective in reconstructing everyday events [7], whereas scent is strongly linked to emotional memory [3].

Everyday remembering includes activities such as recollecting, reminiscing, retrieving, reflecting, and remembering [9]. Sellen and Whittaker [9] further describe these five activities as beneficial to the current LifeLogging culture, which takes everyday remembering to more extreme levels. The functions of everyday remembering include construction of a self-concept, regulating moods, maintaining relationships and problem solving [6].

Design Explorations

Combining the principles on embodied interaction with the knowledge about everyday remembering, three concepts were developed at the faculty of Industrial Design, Eindhoven University of Technology. All of these explore the possibilities of embodied interaction in storing, retrieving and enriching memories in a 4-day pressure cooker setting. Due to space limitations only one concept will be addressed in this paper. We aimed at exploring the interaction possibilities and interpretations of the Embodied Interaction principles.

Design Concept: 'What are the Odds'

By using a set of dice, users can add memory tags to digital photos that are displayed on a set of three thin screens. Each dice offers different possibilities within its own theme. This way tags can be added linked to: whom, what, when, where and weather (this final dice expresses circumstances of the weather that can serve as memory cues). The dice can be used to link the preferred tag to the picture.

The dice can also be used to search through digital images; either by selecting the faces of the dice or by throwing the dice for a random search task. A selection of appropriate photos will be shown on the photo screens. Flicking the screen will scroll to the next picture, thus allowing a manual form of browsing.

Since memories change or adapt over time, links to other memories could start to occur, therefore tagging is a dynamic process. Thus the user can change the tags for each photo collection and can link new collections to older collections by, for example, creating a dedicated dice or icon for that specific memory cue set.

figure 1. The concept: dice showing icons and screens showing photos

People can use this concept to tell their stories to their friends and family. The concept enables both private viewing with one display and group viewing when all displays are put down, e.g. on a table, for everyone to see.

This concept has been developed into a demonstration video and series of photos that communicate the functionality and interaction method of the product. In group discussions we then evaluated the effects of integration of principles of embodied interaction on the interaction with memory artifacts such as photos.

Discussion

It was our aim to study the compatibility of embodied interaction with designing for everyday remembering. Taking Dourish's main principles [1], we can say we were successful in allowing the user to *create meaning* because the users determine what tags to use and how to compose their memory artifacts, we also see the value of users *managing the coupling* in this situation for they are the ones linking their memories to the cues they prefer.

Remembering is a highly personal activity and we found the principles of embodied interaction applicable because they facilitated users to create their own meanings. In our design case the memory cues were embodied in the dice, which were flexible in linking and appeared usable in a range of reminiscing activities. Still, the dice are predefined artifacts, therefore their appearances and associated meanings are always somewhat influenced by the designer.

Our design case explored the value of embodied interaction to storing and retrieving memories. We

believe that by linking more tags to a single digital object (e.g. photo) inherently this object gains more value to its owner. This means that storing a set of tags can cost more time or effort, but will be rewarded when retrieving. For example the photos in the design case: we assume the number of memory cues linked to one individual photo increase through the activity of tagging, because you reflect on that memory from a different perspective, such as the weather. When that photo is later accessed, these tags (visual cues) are expected to enrich the recollection of the associated memory.

In our explorations we looked into linking digital media to the complex nature of memory recollection. Embodied interaction offers a tangible frame for users to work with such memory artifacts (e.g. [4]), whilst still allowing the users to create and add their own meanings to the artifacts.

Conclusion & Recommendation

Through our case study we found that there are many opportunities for designing for everyday remembering from an embodied interaction perspective. Some of the principles appeared particularly suitable to apply to such design concepts, e.g. *embodied interaction turns action into meaning,* and *users (not designers) create and communicate meaning*. Even though this sounds obvious, human memories cannot be accessed directly, therefore a designer should look into the opportunities for coupling (potential) tags to tangible memory artifacts. We found that the embodied interaction perspective offers an approach through which memory artifacts can be created flexible enough for users to create their own meaning and can fit their everyday use and context.

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