Designing interactive interfaces by keeping the natural beauty of public places

Linda Hirsch
Ludwig-Maximilian University
Munich, Bavaria
linda.hirsch@ifi.lmu.de

ABSTRACT

Natural, public places in cities serve often as a place for recreation and relaxation. Additionally, such places often signify historic and social importance about which visitors would like to know more. Screens and other currently existing technology would, however, destroy the natural beauty of such a place. Attention-aware and unobtrusive interfaces seem to offer a solution to this problem. In our approach, we conducted a qualitative survey with 19 people and an epoché at a decommissioned cemetery which is mainly used for recreation and leisure time. Overall, the results show that the majority would like to know more about the deceased with the information closely placed to the grave, but without disturbing the natural, mystical atmosphere of the cemetery. In this work in progress report, we present our research approach to attention-aware, unobtrusive and context-sensitive interactive prototypes that keep the natural beauty and recreational characteristics of such a place.

KEYWORDS

natural public places; attention-aware; unobtrusive; work in progress

1 INTRODUCTION

Public places are essential for building and maintaining a community. Such places enable people to connect, inform and exchange on a cultural, social, political and economical level [1, 2]. Natural places, with which we mean green areas with natural vegetation as seen in figure 2, are additionally used for recreation and relaxation. Cemeteries are such places with at least two diverting visitor groups of interests. One group mourns the deceased and the other uses it for various free-time activities such as dog walking, reading, sports etc. [8], see figure 1. While dealing with various groups of interests and behaviours, little research has been conducted on such

naturally kept public places and how to design and integrate interactive technology in it without interrupting the current meaning as well as display of it. We researched design opportunities and implications by conducting a qualitative survey with 19 participants as well as an epoché at a cemetery with varying vegetation.

Figure 1: Reading, sport, talking, kissing and other activities were observed on the cemetery.

Results led to the assumption that interactive technology that should be integrated into such a place would need to be unobtrusive, attention-aware and context-sensitive to sustain the current recreational characteristic of the place. Aiming at identifying, prototyping and testing potential solutions, this work in progress reports on design implications based on user requirements and observations. We believe that continuing this work could benefit smart city- as well as social development by contributing new design ideas and suggestions for natural, public places based on nature inspired interfaces.

2 RELATED WORK

Integrating interactive technology in public space is already discussed plenty in research in form of ubiquitous computing, ambient intelligence, pervasive computing, etc. It can support the identification process with the city and the society [15], promote cultural transparency [12] or inform about historic events and conditions [11]. Cemeteries are discussed as public places visited for various intentions of use, including due to their natural, green and park-like characteristics [9, 13]. From an Human-Computer Interaction (HCI) perspective, Häkkilä and Colley [3] as well as Häkkilä et al. [4] approached the cemetery as design space, emphasizing the

Figure 2: The natural and slightly mystic place of a decommissioned cemetery invites to recover as well as (re-)connect to former generations and personalities that lived in the city.

necessity of interactive technology in this context to be unobtrusive and seamlessly fitting into the environment. Testing a mobile app [3] for navigation purposes to find the right grave, interviewees criticised the intensive mobile device interaction as disrespectful. In Häkkilä et al. [4], an interactive gravestone was tested with a focus group. The results showed, however, that projection directly on a gravestone was perceived as innovative, but also as an inappropriate placement. The importance of keeping the atmosphere and to respect the meaning of the place was emphasized by the participants. These studies show that there is interest and openness in the community to provide more information about the deceased via technology. However, they also state clearly the importance of considering the meaning of a place in the design as well as the sustainability of it.

Potential solutions could be inspired by context-sensitive systems. Lopez-Cozar and Callejas [7] spoke already about pro-active systems that offered information according to the context. Hence, if required and wanted, information should be provided by the context-sensitive system and, otherwise, it should not interrupt the ongoing process or attract any attention. Other inspiring concepts are considered from sustainable design as presented in Kramer [6], such as biomimicry, which comprises from nature inspired designs and design systems. Further research within HCI in regard to nature inspired interfaces provide, among others, Steer et al. [14] or Jones et al. [5]. Steer et al. [14] mapped different types of gestures to different types of plants according to the plants' affordance. Their plant prototypes were further compared to perceived emotions that could be expressed by different plant statuses. This research suggests new ways of interaction that could also be applied in natural, public places, allowing a very soft and unobtrusive interaction for individuals. Instead, Jones et al. [5] discuss the application of sensors in community gardening to support decision-making processes by informing about various environmental variables and their influence on cultivation. In their study, purposes of community members for

participating in gardening is to get closer to nature and to interact with it. While learning more about nature and its intertwined system, the personal attachment to nature increases.

Nature inspired designs that are embedded in the place and which have an unobtrusive supporting functionality only, seem to enable an intensified feeling of being in the world by requiring little attention by the users and allowing them to focus more on themselves and their connection to the world. Relating these findings and assumptions back to natural, public places in cities, we want to explore ways of integrating interactive technology that keeps the natural beauty and recreational character of such places.

3 RESEARCH AND DESIGN PROCESS

Our research and design process includes an epoché according to Overgaard [10] as well as a survey conducted at a natural, public place, the old South Cemetery in Munich. In the further progress, analysed results serve as a basis for prototyping, implementing and testing ideas. However, in this work in progress, the prototyping is still outstanding and is not further discussed.

We conducted a qualitative survey with open-ended questions at a decommissioned cemetery with a lot of green areas which is mainly used for leisure-time activities. In total, we interviewed 19 participants, 14 female, 5 male. The questions were about (1) the purpose of visiting the cemetery, (2) type of additional information that they would like to get provided, (3) the choice of medium providing information and (4) aspects to be considered when integrating technology into the place. Participants were partly alone or in groups of three or four. Some groups included children which are were not considered in the group discussions or in the number of participants.

The epoché was executed for getting a better understanding of the place, the type of activities people perform there as well as the natural vegetation and atmosphere. Therefore, we spent two hours walking around, taking pictures of and notes about observed situations, plants and applied cultivating techniques to provide naturally appealing limitations and frames.

3.1 Results Survey

As presented in figure 3, the main reason to visit the cemetery, question (1), is the enjoyment of nature through its tranquillity and its beauty. One even called it "eine Oase der Ruhe und des Friedens" ("an oasis of beauty and peace"). Accordingly, participants emphasized in question (4) that this atmosphere and the wild beauty of the place should be sustained. Hence, any kind of technology should not interrupt the current scenario, nor take too much space. Others also worried about the conservation of the technology in regard to potential vandalism or weather influences, as can be seen in figure 4. However, they liked the idea of having something interactive to receive more information. Responses to (2) identified three groups of information that participants liked to receive. 12 participants agreed in wanting to know more about anecdotes about the deceased persons' lives. Anecdotes were understood as short narrations that inform the visitor about a personal story of the deceased, their methods of working or the personal as well as general living conditions in that epoch. Another six participants did not want to receive any additional information. One person rather
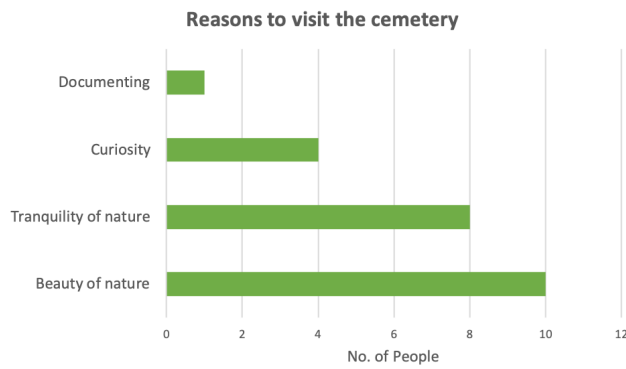
Reasons to visit the cemetery

Figure 3: Main reasons to visit the cemetery are the natural beauty and tranquillity of the place. Some participants mentioned more than one reason to visit the cemetery. The total numbers are based on the frequency, the reasons were mentioned.

wanted to know more about the cemetery and its development, instead of anecdotes about the deceased. Responses to question (3) showed that half of the participants would like to have the information closely placed to the graves, whereas another five of them would rather outsource the information to the outer boundary walls. 4 were indifferent. Suggestions about how information could be provided varied from additional billboards, to audio guides, apps, but also interactive maps, a travel guide and a sort of photo album. About the billboards, one participant further mentioned to use a "Tafel zum aufklappen oder durchblättern" ("billboard to flip open or browse"), which could be a good way to hide the information when not wanted.

Overall, the results show that the majority would like to know more about the deceased with the information closely placed to the
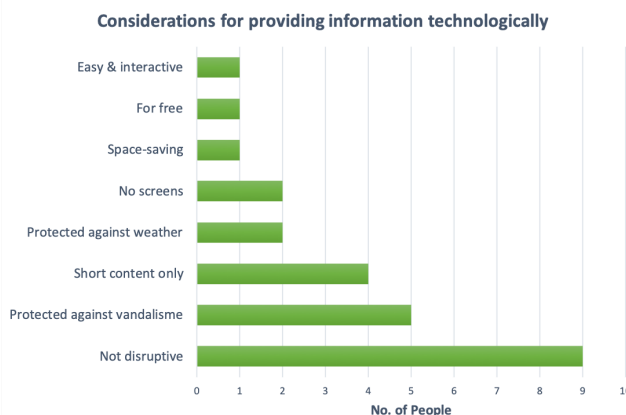
Considerations for providing information technologically

Figure 4: Participants are concerned about the conservation of the place's meaning and natural atmosphere. As the access is currently for free, newly introduced technology should not change this.

grave, but without disturbing the natural, mystical atmosphere of the cemetery.

3.2 Results Epoché

Observed activities include a range of activities like walking alone, with the dog, with a buggy or in groups, sitting on a bench eating, chatting, reading, drinking, texting, kissing, reading or doing sports like running, stretching and riding the bicycle. People visit the place either alone or in groups. Groups of people are often busy chatting about private matters or about the cemetery and the people buried there. When talking about the cemetery, people walk very slowly, looking a lot from one side to the other. Rules of conduct are symbolized through traffic signs which are attached to the outer walls next to the entrances. Some information about the cemetery are already provided along the outer walls, however, none within the cemetery or among the graves. Some graves have inscriptions about the name, family status and occupation of the deceased. Though, many tombstones are either hidden through other tombstones, the vegetation or does not have any information at all. Also, the sizes and presentation of the graves differed a lot, so that visitors can partly not see where one ends and the others start. Some natural cues are applied to indicate borders, protections or guides. Plants and flowers of different types are planted next to each other, so that a natural transition and line is made for indicating different zones or emphasizing certain aspects like a tombstone from a well-known person. Bushes and hedges are either used as protection to hinder visitors to get too close to the graves or for separation and framing some objects from each other. Bricks and gravel are applied similarly, indicating in which areas visitors are allowed to be and to walk. These natural cues serve as inspiration from landscape architecture for the designs of our interactive technology. Figure 5 indicates spatial different levels for placing interactive technology, embedded into the environment. All together, the following epoché results are considered in the further study development:

- People interested in more information walk slowly and turn their heads a lot, alone or in groups.
- Keep shared space for other activities, rather use borders to place technology.
- (Re-)Use natural cues and materials for separating and emphasizing information.

In the study continuation, various prototype ideas are brainstormed and sketched under the considerations of the current results and the hypothesis presented at the beginning.

4 CONCLUSION AND FUTURE WORK

Current results emphasize the importance of unobtrusive interfaces that do not disturb the atmosphere of a natural, public place. Visitors of such places enjoy the natural beauty and tranquillity, but are partly also curious to know more about the place and the people connected to it. As this part of visitors seems to pay closer attention to the graves by turning heads, attention-aware systems offer a solution that could trigger the revelation of additional information only if such a behaviour is perceived. Lastly, our hypothesis states that such interactive systems should be context-sensitive, which could not be backed up with the current results and which, hence, is ignored for the further development for now.
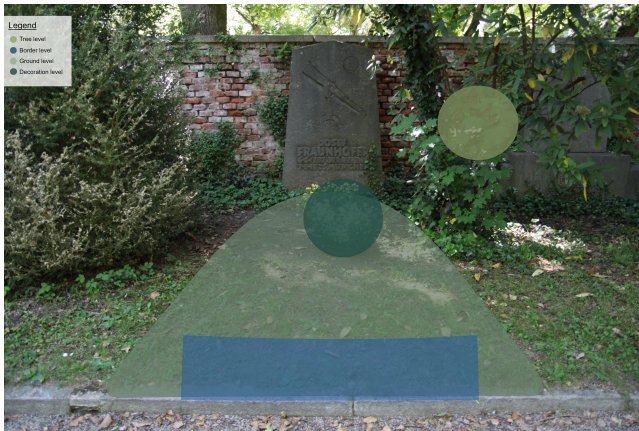
Figure 5: We see various levels for placing interactive technology. In regard to nature inspired design, surrounding trees and plants could be used as unobtrusive interfaces.

Instead, we want to continue with 3 different studies - one focussing on interactive interfaces integrated in graveyards, another on attention-aware and unobtrusive interfaces for public spaces in general, and the last about connecting historic places at today's place and time across the city. At the conference, we hope to obtain first feedback on our ideas, including a discussion on potential design suggestions.

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