Interacting with Meaningful Memory Objects in the Home Context

Ine Mols[1,2] **Elise van den Hoven**[2,1] **Berry Eggen**[1,2]
[1] Eindhoven University of Technology
Den Dolech 2, P.O. Box 513, 5600 MB
Eindhoven, The Netherlands
{i.mols, e.v.d.hoven} @tue.nl
[2] University of Technology, Sydney
15 Broadway, Ultimo NSW 2007
Sydney, Australia
elise.vandenhoven@uts.edu.au

ABSTRACT
Personal objects have meaning to people, beyond the functional meaning they often have emotional meaning, being related to memories and a person's identity. These objects play an important role in our direct surroundings, especially in the spatial contexts of our homes. People increasingly interact with these memory objects and memory media through interactive devices, an area of design we call "reminiscence design". Adopting a human-centric view of spatial context and interactions would benefit design for reminiscence. Broadening the view of interaction between person and cue to include the context and related devices would do justice to the complex memory cuing process. In addition, a memory perspective could provide value when designing ubiquitous systems in the home context by taking into account that object orientations and locations are not only functional but also meaningful for people. An ego-centric approach that is not only about the person's present but also their past, which could enable more engaging and meaningful interaction.

Author Keywords
Interaction Design; Autobiographical Remembering; Memory Objects; Remembering Experience; Materializing Memories; Spatial Context; Ubiquitous Computing.

ACM Classification Keywords
H.5.m Miscellaneous.

INTRODUCTION
Walking into a random living room, you might see a wooden chair, a framed landscape on the wall and a small wooden doll on a dresser. But when looking through the eyes of the owner, you would see an inherited piece from his grandmother, the framed memory of a lovely holiday and a joyful childhood memory on the dresser. Many of the objects in people's homes have hidden meaning, by relating to memories and every person has such a collection. These *autotopographies*, [1] play an important role in our everyday context, especially in the home. Besides these objects there are a wide variety of things that can serve as a *memory cue* [3]: a photo, a word, a scent or digital media. The process of memory cuing is not only dependent on these cues but also on many contextual factors influencing the remembering experience. Our work focuses on design for reminiscence, aiming to support this complex process.

In this paper we argue that the remembering perspective and the human-centered approach to spatial context in ubiquitous computing can benefit from each other. We will describe how the human-centric approach to ubiquitous computing will broaden the view on cue-interaction in memory work. Second, we will argue how a memory perspective can support designing interactive ubiquitous systems for meaningful personal interactions.

MEMORIES IN THE HOME
An autotopography forms a spatial representation of important relations, emotional ties and past events. [1] The objects support some of the main functions of our autobiographical memory, including having a sense of identity or supporting social bonds [1]. The spatial arrangements of objects within our houses contribute to these purposes: we display certain items in public rooms, enabling interaction and triggering dialogue with others. The story behind an object changes depending on the relation between the owner and the audience [6]. People keep different objects on display in personal rooms (such as bedrooms) often related to a more personal identity. Finally, some items are not shown, but rather hidden, sometimes to support forgetting rather than remembering. These arrangements on the level of hidden, private or public can also be applied to the organization of our digital objects, e.g. selection of photos to store privately versus to share online.

Design to interact with memories
The way we interact with materials related to memories is constantly changing, for instance through smartphones (direct access), interactive displays and automated capture.

These communication devices are not often aimed at remembering. However, several concepts have been designed specifically to stimulate reminiscence through interaction with memory items. For instance by having photos physically 'popping up' at home [2]. An examples of bringing digital media into the physical context of the home.

SPATIAL CONTEXT IN REMINISCENCE DESIGN

Memory research often looks at a singular relation between a single cue, a single person and a single memory. However the situation in reality is far more complex. Within a context such as the home, multiple cues are always in the vicinity and a cue rarely triggers a single memory but often starts a chain reaction of remembering. Besides that cuing often does not merely involve a single person but takes place in a social setting. This is already true when looking at interaction in a context with physical objects (such as a souvenir or framed photo) but becomes increasingly complex when digital devices are included.

Adopting a UbiComp approach with a human-centric perspective to this context will allow to better adapt interactions to this complex process. We might envision reminiscence systems that are more contextually aware, sending triggers not based on time [4] or randomly [2] but rather based on context. This could for instance be the location (e.g. in what room, what media relate to that location) or the people present (e.g. showing a picture both people are tagged in, stimulating to reminisce together).

Besides applying this approach to triggering, we could also look at the value of a human-centered ubiquitous system for the process of media *creation* for remembering. Instead of automated systems that aim for total capture we could design systems that help people in recognizing experiences that are potentially valuable memories. In our cultural probes study [5] we found that familiar activities and places from everyday life are often valued. Therefor a device that recognizes repeated events by their contextual characteristics might be suitable to support capturing experiences for future remembering. This could be done by recognizing certain locations, certain movements or certain combinations of people.

OBJECTS & MEMORIES IN UBICOMP

As we illustrated in the introduction many objects within our homes are connected to memories. In other words, the spatial organization of materials in the home are not only practical, but also emotional. We organize materials based on our bonds and related memories. Materials in our surroundings are not only available for physical interaction, but also for a certain "cognitive interaction" on the level of triggering memories. This can influence a persons mood, level of distraction, desire for social contact etcetera. We believe that these factors can contribute to designing engaging interactions within the home, even beyond the field of memory-work. It can contribute to making other interactions more engaging. The spatial context within personal spaces such as the home should therefor be redefined to go beyond the physical aspects of context and incorporate its meaning for the people within this context.

CONCLUSION

Memories play an important role in people's lives, with this paper we hope to have illustrated how *memory objects* play an important role in the homes of people. We have started to describe the complex process of cuing and how ubiquitous technology can play a role in this process. Adopting a human-centered view on spatial context and interactive devices will broaden the approach in design for remembering to look beyond single isolated interactions but enable comprehending the complexity of the process. In addition we hope to have illustrated that the bonds between people and objects should be taken into account when designing ubiquitous systems for the home. Spatial context can be redefined to not only include the physical aspects of context, but also the meaning and the distribution of meaning within a space. This could lead to an ego-centric approach that is not only about the person's present but also their past, which could enable more engaging and meaningful interaction.

ACKNOWLEDGMENTS

This research is supported by STW VIDI grant number 016.128.303 of The Netherlands Organization for Scientific Research (NWO), awarded to Elise van den Hoven.

REFERENCES

1. González, J. A. (1995). Autotopographies. *Prosthetic territories: Politics and hypertechnologies*, 133-150.

2. Helmes, J., O'Hara, K., Vilar, N., & Taylor, A. (2011). Meerkat and tuba: Design alternatives for randomness, surprise and serendipity in reminiscing. In *Human-Computer Interaction–INTERACT 2011* (pp. 376-391). Springer Berlin Heidelberg.

3. Hoven, E. van den, & Eggen, B. (2014). The cue is key: Design for real-life remembering. *Zeitschrift für Psychologie*, *222*(2), 110.

4. Isaacs, E., Konrad, A., Walendowski, A., Lennig, T., Hollis, V., & Whittaker, S. (2013) Echoes from the past: how technology mediated reflection improves well-being. In *Proc. CHI 2013* ACM Press 1071-1080.

5. Mols, I., Hoven, E. van den, Eggen, B., (2014) Making Memories: A cultural probe study into the remembering of everyday life. In Proc. of NordiChi'14

6. Petrelli, D., Whittaker, S., & Brockmeier, J. (2008) AutoTopography: what can physical mementos tell us about digital memories?. In *Proc. Of CHI 2008* ACM Press, 53-62.