



Beyond Looking Back: Designing Interactive Technology Together to Support Blind People's Experience of Reminiscence

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ABSTRACT

There is growing attention in the HCI community on how technology could be designed to enrich experiences of reminiscence on past life experiences. Yet, this research has largely overlooked people with blindness. My doctoral research is oriented toward understanding and supporting blind people's preferences, wishes, dreams, desires and tensions around the experience of reminiscence. I plan to explore research goals by designing and creating an interactive system through a participatory design and co-speculation approach. The research prototype can be lived with blind people in their homes to support their experience of reminiscence. With reciprocity in mind, I aim to involve participants in exploring, designing and reflecting together in all stages of the proposed research. The initial work of understanding blind people's experiences of reminiscence is presented, and how these insights shape the next steps, along with the key values we seek to unpack in the later stages, are described.

CCS CONCEPTS

• **Human-centered computing** → Human computer interaction (HCI); HCI design and evaluation methods; User studies.

KEYWORDS

Reminiscence, People with Blindness, Interaction Design, Designed Research, Field Study, Co-Design

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1 INTRODUCTION

Reminiscence involves reflecting on previous life experiences, which can prompt more profound self-reflection and acts as a precursor for intimate social interactions [9, 22]. Today, as technologies have become seamlessly weaved into people's daily routines, personal data archives that contain everyday life experiences have been growing. (e.g., [15, 24, 34]). These personal data archives and

digital services have been used as assets to assist people in everyday practices of remembering, rediscovering and reconnecting to their personal and social life narratives [7, 23].

In response to this trend, HCI researchers have explored how re-experiencing digital data from the past (e.g., digital photos, audio recordings, social media content, online maps, etc.) can offer valuable resources for supporting experiences of reminiscence (e.g., [8, 13, 29, 30, 35, 36]). The HCI community is advocating for the creation of alternative methods that utilize personal data as resources to offer different perspectives for individuals to revisit and re-experience their past life experiences over time (e.g., [16, 19, 44, 45]). Yet, because sight is our predominant sense, technologies designed to serve these purposes have mostly focused on visual technologies, such as imagery and video. Little research has investigated the intersection among blind people's experience of reminiscence, the use of other senses and alternative forms of data in connection to reminiscence, and the roles of interactive technology. I propose to contribute to this gap by designing a new form of interactive technology with participants to better support the reminiscence experience for people with blindness.

My research is theoretically grounded in Research through Design (RtD) methodology [18, 50, 51], blended with a co-design approach [41] to build an ongoing, collaborative relationship with research participants [5, 43]. Moving away from services and devices "developed with sight in mind," situated, nuanced and lived experiences will be carefully observed, understood and reflected in the design of new technology for people with blindness [25]. In advocating new pathways, fostering rich and inclusive engagement with people with disabilities in the design process is essential [26, 37, 39]. In this strand, I aim to promote close engagement with participants in all stages to exchange feedback and respect their values and voices. I also continue to communicate with participants, their loved ones, and the relevant community members about the research findings and outcomes.

This ongoing research has been conducted in the School of Interactive Arts and Technology at Simon Fraser University in Western Canada, where I have already published two full papers as part of this research program [47, 49]. I am working under the supervision of Dr. William Odom, who specializes in RtD and Interaction Design for creating domestic technology to enrich people's everyday life experiences. Currently, I am in the third year of my PhD program, expect to complete in 2025. This is my first time attending a doctoral consortium.

2 RESEARCH QUESTIONS

Overall, my proposed doctoral research examines the following questions:

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Figure 1: Visiting participants' homes for interviews.

- How do people with blindness capture, share, and revisit meaningful moments in their lives?
- What is the role of interactive technology in supporting experiences of reminiscence for people with blindness?
- What design methods, tools or activities should be employed to draw and surface participants' wishes, desires and dreams upon designing and speculating together?
- How should interactive technology be designed together with blind people to enrich their existing patterns of reminiscence and to offer new experiences of reflecting on the meaningful moments in their lives?
- How could this new experience of reminiscence contribute to positive self-reflection and intimate social connections with loved ones?

3 RESEARCH PROGRAM AND PROGRESS TO DATE

The overarching goal of my doctoral research is to bridge the gap between designing with personal data and the experience of reminiscence for people with blindness. To explore the research questions stated above, my proposed research consists of three stages: (i) *Exploration*, (ii) *Ideation and Creation*, and (iii) *Deployment*. Each stage employs distinct yet complementary research approaches. Throughout all stages, I will follow a design research process informed by Research through Design (RtD) and co-design practices. In each step, I will utilize both methods to shed a nuanced light on current practices, shape a concrete interactive device, and eventually evaluate its use through prolonged field deployments. Currently, I am in the *Ideation* stage for preparing interactive activities that will be used in a co-design, co-speculative workshop to explore possible design decisions together.

3.1 Exploration

The first stage, *Exploration*, aims to understand blind people's existing patterns, tensions and desires regarding their reminiscence experiences and to investigate possible design opportunities for later stages to support the experience.

3.1.1 Exploratory Interviews with 9 Blind Participants. I conducted semi-structured interviews by visiting 9 blind people's homes to understand how people with blindness capture, keep, share, and reflect on their life experiences in support of reminiscence, self-reflection and social connection. This work was published first as a Work-In-Progress (WIP) at DIS 2020 and then later at CHI 2021 as a full paper [48, 49]. I engaged in individual semi-structured interviews with each participant. Interviews took place at participants' own homes, lasted from 1.5 to 2.5 hours. Participants' homes are selected as the research site because it would allow them to offer first-hand insights into where participants kept their significant possessions. Also, the home setting is much more relaxed than other research sites, such as labs or meeting rooms on campus, making participants feel comfortable sharing their personal stories. Interview questions were designed to explore how specific cues or triggers evoked past memories, the role of physical or digital possessions in this process, and how current life experiences are documented (whether physically or digitally). This phase helped establish a fundamental understanding of the participants' perceptions of reminiscing.

Afterwards, I requested participants to give a tour of their homes to introduce meaningful possessions (both physical and digital) participants owned, how they interacted with them, and the stories or narratives associated with them. I paid close attention to the language participants used to depict how their possessions evoked reflective experiences. This often led to detailed descriptions of personal experiences, thoughts, limitations and tensions around their significant possessions. Interviews were wrapped up with

discussions on prospective topics, such as the possible usage of new technologies for capturing, revisiting and sharing memories. Participants frequently shared their experiences of where technology has failed to meet their desires.

The study has provided foundational insights into three design implications for supporting reminiscence experiences for people with blindness – reminiscing through; (i) sound (e.g., sound recordings of loved one's voices and soundscapes), (ii) social interaction (e.g., stories and descriptions that are shared and developed with people around them), and (iii) tangible artifacts (e.g., cherished possessions and souvenirs as a symbol of memories). It became clear that sound is one of the most preferred, commonly used mediums by blind people. The proposed research will directly build on the exploratory study by focusing on designing for reminiscence experience through different types of sound (e.g., personal audio recordings, soundscapes, loved ones' voices and music) to explore and design for new opportunities of reminiscence for people with blindness.

3.1.2 Delivering the Research Outcome – Creating an Audio Documentary for Participants. Upon moving on to the next stage of research, it was necessary to deliver the research outcome to participants to appreciate their participation and contribution and to respect their ownership in the research project. Yet, back in 2021, holding an in-person debriefing session was impossible due to the pandemic. Therefore, an audio documentary was created to translate the research outcome, including the findings, discussions and reflections, based on participants' voices, stories and experiences. The process of creating the audio documentary and the insights we have learned in the journey of making the documentary was published as a full paper at DIS 2022 [47]. As an intermediary step, I led a design-led research process that took almost seven months to create an hour-long captivating audio documentary that incorporated our participants' narratives.

Heavily inspired by a decolonial research approach and sound studies that maintain stories within shared story worlds [2, 38], the objective was to create a form of research that could be given back to the participants and their loved ones, also to the broader blind community members. Through careful design choices and sharing the audio documentary on the interactive sound platform SoundCloud, I aimed to not only give back but create opportunities for participants to communicate with the research team and also with each other. This type of research dissemination assisted in building even stronger relationships for the long-term participatory research I intend to conduct by establishing reciprocal relations. Creating the audio documentary was not merely a matter of translating the research publication into an audio format. Instead, this process required careful consideration to overcome various tensions regarding narrative flow, handling participant voices, pacing, and incorporating "communicative silences" [1] for providing listeners the moments of pause, reflection, and response.

3.2 Ideation and Creation

Currently, I am in the **Ideation** stage. The overarching goal is to probe design ideas collaboratively with participants on their experiences of reminiscence. Drawing on the co-design and participatory design strategies [28, 40], I am preparing to host a group

workshop for participants to speculate possible opportunities and explore design decisions together, which will eventually become an inspirational guide for creating a research prototype.

3.2.1 Co-design Workshop – Making Design Decisions Together (ongoing). The co-design workshop aims to gain deeper insights into participants' wishes, desires and dreams toward the experience of reminiscence. The workshop will consist of group discussions and interactive activities (e.g., [4, 25]). Although the details are still being developed, inspired by co-speculation workshops (e.g., [3, 42, 46]), I wish to create activities that are specifically designed for the participants. I am exploring a wide range of activity types, such as storytelling, music, art & craft, roleplaying and reenactments, co-listening, tactile tour, poetry, etc.

I intend to use data and insights collected from working with participants over the years. Sound is one of the promising resources that can be developed into an activity, which is found to be one of the promising design initiatives from the **Exploration** stage. Yet, there have been no sessions dedicated to sound, so I followed up with participants for small-group discussions and shadowing activities inspired by the "Go-along" interview [10] to record the soundscape, conversation, and audio interaction of the experience.

From these activities and group discussions, I will draw insights into the types of sound recordings, how blind people revisit short and long sound recordings, the characteristics of recorded sounds and how these recordings are shared with their loved ones. Later, these will influence the workshop activities, not only sound but other important qualities as well, such as tactile, stories, scent, etc. During the workshop, participants will engage in 4-5 activities for about 3 hours. These activities intend to help participants speculate and discuss (i) design qualities (e.g., shape, material, form, textures), (ii) possible features and interactions of a research artifact, and (iii) situation (when), place (where) and people around them (who) they wish to share their memories together. These design decisions and participants' feedback will guide the development of a research artifact in the next stage.

3.2.2 Developing Robust Research Prototypes (future work). The central methodological approach used in the **Creation** stage is Research through Design (RtD). RtD is a research-creation approach developed in the interaction design community [18, 50, 51]. RtD frames a design inquiry as a critical reflective practice that closely ties research questions with the creative processes of design. The making and studying of design exemplars can provide new insights into people's lived experiences with them [17]. In the **Creation** stage, I will finalize a series of design concepts distilled from the Ideation stage and create fully functional, highly finished research artifacts. The research artifact (or 'research product' [32]) is a technological system that can be used and lived with people over time at people's homes. A small batch (3 to 4 units) of the final design will be created.

3.3 Deployment (Future work)

3.3.1 Longer-term field deployment. In the **Deployment** stage, I will place the artifacts in selected blind participants' everyday living environments (e.g., the home) for an extended time (6-8 months). Field deployment is a common methodology in interaction design



Figure 2: Small-group discussions and shadowing activities to collect resources and inspirations for designing workshop activities.

research to investigate participants' lived experiences and interactions with research artifacts [20, 21, 31, 33]. Each month, I will conduct semi-structured qualitative interviews by visiting participants' homes to observe and track experiences with the deployed artifacts, along with a more in-depth concluding interview at the end of the deployment period (See [33]). To analyze the data, I will follow Braun and Clark's approach to thematic analysis [12]. All interviews will be audio-recorded and transcribed. After each interview, data will be iteratively analyzed to surface underlying themes, which will be merged with the overarching themes [27]. Participant responses will be initially analyzed inductively using open coding. As themes emerge, I will group codes into categories and identify themes across categories.

4 EXPECTED CONTRIBUTIONS

My research has the potential to broaden the understanding of reminiscence experience from different perspectives, benefiting both the HCI and design research communities and the blind community. The research artifact and the new insights gained from the field study aim to initiate and uphold conversations between researchers, participants, and the blind community (e.g., [6, 11, 14]) on new ways of interacting with personal data in connection to reminiscence for self-reflection, personal growth, and intimate social bonding. Research findings will be disseminated through academic publications and presentations at conferences and journals, and research artifacts will be presented at academic and design workshops. So far, I have published one WIP paper [48], two full papers [47, 49], and one audio documentary¹ publicly shared on SoundCloud. Moreover, I highly appreciate the continuous relationships that I have built and developed with past and current research participants and their loved ones, who are as passionate and curious as I am

about this research. I will continue exploring reciprocal forms of dissemination, such as audio documentaries, public exhibitions, or audio/video collages (e.g., [47]) for participants, their loved ones and members of the blind community.

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¹<https://soundcloud.com/homewarelab/beyond-looking-back-full-audio-doc>

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