If These Walls Could Speak: Tangible Memories

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ABSTRACT

If These Walls Could Speak provides an alternative memory storage system using tangible objects versus the written words common in diaries. Using river rocks as a memory token, a user can listen to past audio memories stored in the stones, or record their own new ones. This piece explores new forms in tangible memory collection and retrieval by allowing users to store their memories in a physical object. In this way, the project contributes to the development of ubiquitous tagging and computing as an aide for sharing and preserving stories.

CCS CONCEPTS

• **Human-centered computing~Sound-based input / output** • **Applied computing~Fine arts** • *Information systems~Multimedia information systems*

KEYWORDS

interactive art, non-linear narratives, memory, tangible interface, story, documentation

ACM Reference format:

Matthew Mosher. 2017. If these walls could speak: Tangible memories. In *Proceedings of AM '17, London, United Kingdom, August 23–26, 2017,* 4 pages.

https://doi.org/10.1145/3123514.3123562

AM '17, August 23–26, 2017, London, United Kingdom

ACM ISBN 978-1-4503-5373-1/17/08.
https://doi.org/10.1145/3123514.3123562

1 INTRODUCTION

If these walls could speak was developed to create a non-linear memory storage system from a collection of rocks, where each stone can recall an audio history of its significance to its collector. Unlike a traditional diary, *If these walls could speak* is object based versus chronology based. This allows people to quickly jump to the story they would like to hear by selecting the rock associated with that memory. In doing so, *If these walls could speak* creates a tangible user interface devoid of graphics and screens, that relies on touch and hearing for interaction, and conceals the technical components that make it work. With this interface users can preserve their memories for friends and family.

Figure 1. *If These Walls Could Speak* memory shelf with memory stones.

2 INTERFACE

From left to right across the top of the interface there is: a large basin to store the memory stones, an audio speaker, a microphone, a status LED, and lastly the RFID reader compartment. In public installation, when a participant takes a memory stone from the basin on the left side of the shelf and places it in the reader on the right side one of two things happen. If the selected stone has a memory file associated with it the central part of the shelf plays back the audio recording of that memory for the user to hear. The audio memory will play until the end of the track even if the stone is removed from the reader. However, removing the stone and placing a new one in the reader compartment will immediately stop the current track and play the one associated with the new stone. If the stone does not already have a memory file the shelf plays an audio prompt asking the participant to record some thoughts about a wall or stone that they remember. As soon as the prompt is finished it begins recording. To complete the recording, the user removes the stone from the reader and then places it back down in the reader. This is done to re-trigger the RFID scanner, and immediately plays back the recording for the user to verify. Both of these behaviors are explained in the audio prompt. A delete card can be used to clear the memory of a rock if the participant is not satisfied with it upon

playback. To use the delete card, tap it on the reader and then tap the stone to be deleted on the reader. The delete card also triggers an audio prompt with instructions on its use. The LED on the surface of the shelf provides visual feedback on what mode the shelf is in: pulsing blue for standby, green for playback of audio memories or instructions, red for recording, magenta for when the delete card has been tapped, and cyan if the disc space of the system is filling up. Red oak wood was used for the construction of the shelf, due to its warmth and color, which invite touch. River stones were likewise used for their tactility. For people who collect rocks, each stone could hold a memory of its origin so as not to be confused with others over time.

This work implements the tangible interface theories pioneered by Hiroshi Ishii and Brygg Ullmer [4]. The constraint in the system is the size of the rocks relative to the size of the reader opening, while the stones themselves serve as the tokens [9]. All of the smooth river rocks are roughly the same size, similar to that of an adult's fist, and feel nice in the hand due to their texture and weight. However, on picking one up, it is clear visually and kinetically that only one rock will fit in the reader at a time. The system relies on body movements that extend beyond simple button pushing, and provides most of its feedback in audio and tactile form [1].

3 TECHNICAL SPECIFICATIONS

The system is run by an Arduino, an audio shield modified for recording, a powered speaker, a microphone, and a RFID tag reader. Each rock has a unique RFID tag embedded in it. Audio files are stored on a SD card, as is the audio file to RFID tag index text file. To store the RFID tag to audio file associations the program simply adds the RFID tag as a new line to the index text file. The new line number becomes the file name for the new audio track. When a memory is erased, only the RFID tag to sound file association is overwritten; the audio file remains on the system's SD card for documentation purposes. Video is available online at: http://matthewmosher.org/php/search.php?art_id=60.

4 RELATED WORK

If These Walls Could Speak project presents a fully realized integrated system for object storage, audio recording, and playback related to the tangible memory concepts discussed in *The Memory Box* and *The Living Memory Box* [3, 8]. *Mementos* uses a RIFD to tag physical souvenirs with photos from vacation travels, which can be displayed in a public kiosk along with location data or on a home computer [2]. *FM Radio* archives and plays audio narrative of family mementos using the metaphor of an analog radio, but does not associate memories with individual objects [6]. *Tales of Things* implements the most comprehensive system for tagging physical objects with text and photos using a combination of NFC and QR codes [5]. However, content about the objects is retrieved via a website or smartphone app, not a dedicated hardware system. Using a dedicated hardware system makes the retrieval process more intentional and focused, as with the experience of browsing a physical baby book or photo album.

5 FUTURE DEVELOPMENT

While rocks work well for the original concept of this piece, similar systems could be developed for other objects. RFID kits could be made so that end users could tag their own souvenirs and mementos for memory storage. This would allow people a system to document their existing autotopographies for preservation and sharing with others [7]. A selection slider could allow for multiple memories to be stored in a single object, perhaps from different people. Future iterations of this piece will include network capabilities so that the association list of RFID tag codes to memory files and the audio files themselves could be stored online, allowing one tagged object to trigger playback of the same memory on multiple different shelf readers. With an online memory database people could share their tagged objects with others, give them as gifts, and embed heirlooms with audio stories.

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