

Virtual, Remote Participation in Museum Visits by Older Adults

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OBJECTIVES

Our general goal is to devise methods and develop tools that enable older adults to experience museum visits from home. In general, we take the approach of leveraging friends or family members that can visit the museum, who act as facilitators in the remote experiencing process. The methods derive from insights obtained by studies we have conducted and range from low-intrusion ones (where family members enjoy their museum visit, and sharing of experiences is facilitated by allowing them to “bring home” memories of their visits that can be easily shared with older adults) to methods and tools enabling a synchronous interaction between family members and the older relative during the visit (e.g., via dedicated virtual environments). This latter is the focus of our ongoing work.

CONTEXT AND RESULTS SO FAR

Virtual environments have already been used in cultural heritage allowing the broad public to appreciate cultural content. This is the case of many virtual museum applications, which offer the opportunity to explore objects from remote, providing additional multimedia information about the presented objects. Although they are helpful, these applications still lack powerful mechanisms to engage audiences that for different reasons cannot physically come to the museum. Older adults’ ability to travel can be limited due to physical isolation, lack of transportation as well as health declines [10, 3]. One way to deal with their challenge is to provide virtual environments for participation from remote.

We started with the premise that in order to understand prerequisites for remote co-visiting, it is necessary for us to understand both, the onsite and the remote visitors and their sharing habits. We investigated what on-site visitors share and bring home in two different museum settings (with around 1000 face to face interviews and follow up questionnaires) and we addressed what seemed to be a major limitation of today, that of being able to easily access, save and consume content that we can use as the basis of storytelling [7, 5]. We developed three ways for saving (or “bookmarking”) and sharing artifacts during the visit, adapted for different types of visitors: i) a low tech method for non-tech people: visitors mark on a printed form all the preferred artifacts; ii) a big screen application: visitors can select the preferred artifacts from a big screen positioned inside the museum, and iii) a smartphone application: visitors can use their smartphones to read QR codes and NFC tags associated to exhibits

and add them to favorites. Using these methods allowed a visitor to receive by email a link to a webpage, in form of a booklet, where he/she can consume and share at home the bookmarked material. With this intervention, the sharing of content from museum visits with non-visitors nearly tripled compared to the sharing rates in absence of technology, and sharing on social networks nearly doubled [5, 6].

We then adapted the booklet for older adults with different abilities, and, given that museum visits are social experiences, also added social context to it. We performed two studies. The first study was on the usability of the booklet, where we measured and compared the performance of four tasks performed by older adults with and without cognitive decline [6]. We found that browsing of the booklet (and by this consuming content) was possible even for the of group of cognitively impaired adults. The second study (in publication phase) was on the feasibility of remote participation, where we measured the impact of different designs and interaction techniques on participants ability to understand, follow and engage in museum visits. Participants were able to understand the tour and engage in contextual conversations. The ability to follow the tour was found to be strongly influenced by the interface application design. All participants were able to understand the tours in our experimental setting.

NEXT

Our ongoing work focuses on remote participation in museum visits, taking into account findings from previous research on museum experiences for remote visitors [2, 4]. In these studies remote visitors visit the museum using virtual environments while interacting with their onsite companion(s) via an audio channel. The evaluation of these systems shows that audio interaction, spatial awareness, and mutual visibility are essential factors for co-visiting from remote. Our work advances previous works by specifically investigating how we can improve these aspects.

We argue that social interaction, and immersive interface are important to create an effective remote museum visit because they contribute to the experience in different ways: social interaction with the onsite visitors increases the sense of “being together with the group,” and an immersive interface contributes to a sense of physically being there. In the following work we specifically will explore remote participation with additional mechanisms to stimulate curiosity and exploration via narrative. We are currently designing a study where older

adults are presented with a virtual museum interface and follow a group of people (e.g., family members) in the museum visit through a narrative that connects the exhibits on the path. The immersive theatrical interface and the story will be used to explore the effects on engagement, enjoyment and social and spatial co-presence of both the onsite and the remote participants.

APPROACH

We track visitors' location inside the museum (with beacons installed in the museum) and present visitors relevant information as they arrive to an object. We deliver the same digital content synchronously to the remote participant. We have a story, written by a professional studio, connecting the objects on the path. Selected objects on the path are associated with specific story segments. A story segment is delivered to the onsite visitor(s) only if all the onsite companions are close the triggering object. The story is about two aliens landing close to the museum. They learn more about the evolution on Earth based on the exhibits in the exhibition. The story ends with aliens discovering an important insight that may save their race from extinction.

We select participants from a care home distant from the museum, home for many older adults with physical difficulties to move. A call from a caregiver explaining the details of the study and asking interested families to participate in the experiment will be published in the institution. Participating families will be offered free entrance to the museum, and the older adult will participate in their museum visit from the institution via our interface (Figure 1).



Figure 1. Interactive tour interface: all the onsite companions are at the same object, and there is a story segment associated with this object (told by the aliens). The group listens to the segment facing the stage. The stage presents the object in zoomed in view.

In order to study the effectiveness of the intervention, we plan to measure the following variables for our study:

- **Engagement:** The ITC-Sense of Presence Inventory (ICT-SOPI) questionnaire [8] is a technology-agnostic presence scale that consists of 46-items, each validated for independent use. We intend to use the Engagement sub-scale (e.g., "I felt involved (in the displayed environment)", "I enjoyed myself", "My experience was intense").
- **Spatial presence:** The ICT-SOPI questionnaire can be used also here, using the Sense of Physical Space sub-scale measuring the sense of being located in another place, in this

case the museum (e.g., "I had a sense of being in the scenes displayed", "I felt I could have reached out and touched things (in the displayed environment)").

- **Social closeness:** The Inclusion of Other in Self scale (IOS) [1] is a single-item, graphical measure that shows two circles for self and others at various levels of distance until they substantially overlap. Our participants will indicate which one represents best the perceived interaction with the onsite companions.
- **Enjoyment:** Four items on a five-point Likert scale from the GEQ scale [9] will measure enjoyment in the experience (e.g., "I enjoyed the experience").

Social experience and immersive interfaces offer a powerful way to develop new museum experiences from remote. Thanks to our collaboration with the daily centers and care homes that participated in our prior studies, we know that there is a strong demand for methods and tools that increase participation and social inclusion, especially for older adults that are not able to participate in physical activities. We are therefore keen to continue our collaboration with the involved stakeholders and to run our new study in January, 2015.

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