Virtual recreation of an interactive multimedia art installation from 1977

Alessandro Russo[1,*], Andrea Franceschini[1], Antonio Rodà[1] and Sergio Canazza[1]

[1]*Centro di Sonologia Computazionale (CSC), Department of Information Engineering (DEI), University of Padova, Via G. Gradenigo 6/b, Padova (PD), 35131 Italy*

Abstract

This paper presents the work in progress carried out at the Centro di Sonologia Computazionale (CSC) of the University of Padua on the reactivation of the interactive art installation "*Autoritratto per 4 camere e 4 voci*" by Italian video artist Michele Sambin. Interactive multimedia art installations are a particular cultural heritage that, due to their complexity and heterogeneity, needs specific preservation strategies for conservation and access. In this context, we believe it is useful to explore the use of Virtual Reality (VR) as a way to document this kind of installations, fostering a dissemination that takes into account the complexity of the work and the interactive nature of the visitor experience. We performed the reactivation by exploring two distinct approaches to preserve and recreate the artwork: the migration of the artwork, which uses modern technologies while maintaining the original concept, and a complete virtualization of the installation in VR. The main objective of this work is to analyze and compare the advantages and disadvantages of the two different reactivation modalities, thus offering an in-depth perspective on the aesthetic, technical, and conceptual implications of both approaches.

Keywords

Virtual Reality, Art Installations, Digital Restoration, Cultural Heritage

1. Introduction

Interactive multimedia art installations, with their complexity and heterogeneity, pose unprecedented challenges for curators and conservators and an urgent need for specific preservation strategies for the conservation and access to this cultural heritage. These works require a diversified and dynamic approach due to the huge variety of hardware, software, technologies, and materials employed. In this scenario, the need to reactivate interactive art installations is due to their complex nature (i), short life expectancy and obsolescence of digital and analog components (ii), and their time and process-based nature (iii). In the last years, in response to this need, different approaches have been explored, and several European projects have been initiated with the aim of preserving and documenting interactive multimedia installations, such as the works of ZKM in Karlsruhe, and the Horizon's project *Dynamic Preservation of Interactive Art: The next frontier of Multimedia Cultural Heritage* and *New Approaches in the Conservation*

AVICH 2024: Workshop on Advanced Visual Interfaces and Interactions in Cultural Heritage

*Corresponding author.

†These authors contributed equally.

russoale@dei.unipd.it (A. Russo); andrea.franceschini@dei.unipd.it (A. Franceschini); roda@dei.unipd.it (A. Rodà); sergio.canazza@unipd.it (S. Canazza)

0000-0001-6691-759X (A. Russo); 0000-0001-8665-6147 (A. Franceschini); 0000-0001-9921-0590 (A. Rodà); 0000-0001-7083-4615 (S. Canazza)

of Contemporary Art (NACCA). The Centro di Sonologia Computazionale (CSC) [1, 2] of the Department of Information Engineering (DEI) of the University of Padua started to address this problem in 2014 [3], and this led to the definition of the Multi-Dynamic Preservation (MDP) Model [4]. Currently, we are exploring new reactivation strategies in order to take advantage of new technologies for preserving, reactivating, and documenting contemporary art. Among various emerging technologies, Virtual Reality (VR) appears promising. In fact, the growing attention towards the digital transition and the metaverse offers new perspectives for addressing this problem with innovative approaches. Despite being extensively explored in various contexts (e.g., Cultural Heritage [5] and Video Games), little has been done within the preservation of contemporary art [6, 7], but we believe it is a technology that may have a lot of potential implications in this field. In this contribution, our purpose is to analyze and compare the advantages and disadvantages of two different reactivation approaches, *migration* – the use of modern technology while keeping the concept intact – and *virtualization* – the recreation of the artwork in a Virtual Reality (VR) space – applied to the same case study: an interactive installation from 1977 *Autoritratto per 4 camere e 4 voci* (Self-portrait for 4 cameras and 4 voices) by Italian artist Michele Sambin.

2. Case Study: *Autoritratto per 4 camere e 4 voci* by Michele Sambin

The interactive installation *Autoritratto per 4 camere e 4 voci* was presented by Michele Sambin in 1977 during the International Performance Week organized by Renato Barilli at the Museum of Modern Art in Bologna. The installation employed four cameras positioned at the cardinal points to film the artist's face. These cameras were connected in a closed circuit with four CRT monitors placed in front of the artist. Sambin would then rotate on a stool while emitting vocal sequences, altering the vowel combinations depending on the cardinal direction. As a result, the spectator witnessed a sort of self-portrait of the artist, represented on the four monitors from various angles but in continuous rotation. In this installation, Sambin challenges established conventions by using a tool commonly used for documentation (CCTV camera) as a fundamental component of the performance itself.

3. Reactivation of the artwork

3.1. Migration

According to the classification of preservation approaches proposed by the *Variable Media Initiative*, a preservation strategy of the Guggenheim Museum, which divides them into (i) *Storage*, (ii) *Emulation*, (iii) *Migration*, and (iv) *Reinterpretation*, the term *migration* indicates a reactivation performed by upgrading equipment and source materials without losing the original concept of the artwork [8]. We performed the first reactivation of the artwork by employing modern technologies to replace obsolete original equipment, such as CRT monitors and CCTV cameras (Fig. 1a).

We decided to use common smartphones as acquisition devices, as they have become commonplace tools for capturing moments in everyday life for many people. The smartphones

(a) (b)

Figure 1: (a) Prototype of the reactivated installation (Migration); (b) A frame from the VR application (Virtualization).

use their integrated cameras and, through the Iriun Webcam App [9], transmit signals to a computer equipped with four monitors connected to a multi-in/out dock via HDMI. The four video signals are managed by a Max/MSP patch, which enables the activation of each monitor at the end of the respective artist's rotations. The software also manages the playback of the sound sequences envisioned in the original installation. These sequences were digitized from the original 1/4" magnetic open-reel tape dating back to 1977, preserved in Michele Sambin's personal archive, which has been restored and digitized by the research team of CSC. For the restoration and digitization of the original sound materials, the CSC applied the methodology described in [10]. The tape features a quadraphonic configuration, where each channel was recorded with a sequence that corresponds to a complete rotation of the artist at 360 degrees, with approximately a 1-minute delay between each rotation, which is how long Sambin took to complete a single revolution. Both the activation of the video screen and the playback of the audio sources are managed directly by the artist through a remote controller to allow him to have a certain degree of control over the performance.

3.2. Virtualization

A physical reactivation of this kind of performative artwork has certainly appeal, especially as it ensures its future performability. It does however have limits tied not only to its physicality but also to the presence of the artist, which is a key component of the artwork.

As an attempt to circumvent some of these limitations, and with the intention of facilitating access to members of the public and conservators, we decided to create a second reactivation of the installation using Virtual Reality (VR) as an application using the open-source video game engine Godot [11]. We modeled parts of the virtual environment using the open-source 3D modeling software Blender [12], although some of the items in the scene are adaptations of free stock models from Sketchfab.[1] We based the virtual environment on photographic documentation from the time and recreated the setting composed of four CCTV-like cameras on tripods, four CRT television sets placed on a table between the cameras and the observer,

[1] https://sketchfab.com

and associated artworks placed on the wall at the back. As the artist is a key component of the artwork, we plan to create a 3D scan of Sambin to be placed in the virtual environment. We temporarily replaced the artist's avatar with a featureless mannequin and placed it where the artist would sit during the performance. We then animated the mannequin to rotate synchronized with the digitized audio sequences, ensuring everything was in place so we can easily drop in the 3D scanned avatar. The cameras frame a close-up of the head of the artist from four sides, like in the original installation, and each camera relays its image to its own TV screen. The screens are turned on one after the other, in a sequence from left to right, every time the mannequin completes a revolution. The environment is brightly lit with soft near-white lights in according with the photographic documentation related to the performance of 1977 and to avoid harsh shadows that may appear of low quality on some hardware. The Meta Quest 2 VR headset was the development device of choice. Figure 1b shows a frame from the application.

4. Discussion

Both reactivation strategies have pros and cons. First, considering the *migration* of the artwork, this kind of approach can expand the original concept of the installation without betraying it by using new technologies. Visual and sound elements, for example, can be improved using larger screens and real-time processing. In *Autoritratto per 4 camere e 4 voci*, the interaction of the artist with the video devices is a fundamental component of the performance, which can be faithfully preserved in the *migration*. Nevertheless, this approach is constrained by the necessity of the presence of the artist, as well as the central role of the implementation space. This can be limiting, particularly in relation to access to the artwork.

VR may serve as a valuable documentation tool, offering the possibility to faithfully recreate the original installation, and enabling remote access to maximize inclusivity. This is particularly important considering the needs of scholars, researchers, and conservators, as well as individuals with disabilities. VR also enables the representation of obsolete equipment that were originally part of the performance (e.g., CRT monitors) and may no longer be available as physical, working items, providing viewers with an accurate recreation within the virtual space. As the metaverse gains prominence in popular culture, VR allows to maintain the interactive part of this kind of artwork as well. Our next steps include the evaluation of the user experience for both versions of the installation, also involving the artist in the testing phase. We believe that the possibility offered by the creation of 3D avatars will open new ways (e.g., the artist controlling their virtual counterpart), especially when considering the preservation of the interactive aspect of the performance. In conclusion, we believe that VR is a promising solution for preserving this cultural heritage, as it can drastically improve access to artworks in comparison to the reactivation by migration, which would be inevitably limited to a few hundred spectators, also being a worth-mentioning solution from an economic point of view (i.e., less maintenance costs in comparison to host a temporary exhibition/performance in a museum/art gallery).

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