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# Interacting with (Hi)Stories, through a New Media Art Project

**Keywords:** Tangible and Embodied Interaction; New Media Performance; Interactive Installation; Archive; Narrative; Opensource Software; Computer Vision; Dynamic Projection Mapping; Augmented Physical Objects; D.I.W.O.; Local Community; Collective Production.

## Abstract:

This paper presents a new media art project for interactive visualization of archival material. The interactive interface allows the establishment of new associations between *phygital* (physical/digital) elements and the articulation of plural narratives, through tangible and embodied interaction. It introduces the interactive installation and performance *Memory Containers*, where digital footage and physical objects merge into an augmented interactive space. Visuals are mapped on found objects and follow their movement, through a custom opensource real-time projection-mapping software. Thus, the users can rearrange the objects and build physical structures, while they create new links between the digital images. The project was a result of the collaboration between interdisciplinary artists and local community agents. The paper describes the D.I.W.O. (Do It With Others) practices applied, and the technical solutions adopted. It also discusses the ways that interactive visualizations of archives provide opportunities for broader access to archival material, forging a revisiting, reappropriation, and reframing of (hi)stories.

1. Medea Electronique, accessed January 28, 2018. <http://medeaelectronique.com/>

2. Koumaria residency, accessed January 28, 2018. <http://medeaelectronique.com/koumaria/>

## 1. THE CONTEXT

The *Memory Containers* project was developed during the *Koumaria* residency 2014, organized by the Athens-based interdisciplinary arts collective *Medea Electronique*. *Medea Electronique* was founded in 2006 and consists of artists who work in the broader field of contemporary art. They are active in fields such as music, animation, multimedia, art installations, interactive technologies, and multimedia event production, merging separate research and practice fields.<sup>1</sup> Since 2009, *Medea Electronique* collective organizes a 10-day experimental artist residency annually at Sellasia village, near Sparta in Greece, focusing on improvisation and new media practices. Artists from all over the world come together to create a multicultural and cross-media ‘dialogue’ culminating in a collective presentation in Athens at the end of the residency.<sup>2</sup> The 2014 *Koumaria* residency focused on the theme of *improvisation and politics in collaboration with the local community*.

Under this context, resident artists spent ten days in an olive grove situated in the region. During that time, they had the opportunity to meet the inhabitants of the village, attend their daily activities, get involved in discussions and interview some of them. They also had the chance to incorporate in their creative work images from the photographic archive of Sellasia, courtesy of Mr. Ioannis Kapetanakis. The archival material was combined with contemporary footage of the area, created by the resident artists during their stay in the region.

The *Memory Containers* project was premiered at the abandoned olive processing plant of the village, which opened its doors after many years for the occasion. Moreover, all the found objects used in the project belonged to the equipment of the plant, including tools used for olive harvesting, storing, transportation, pressing and oil extraction. The engagement of the local community at all stages of production and exhibition of the artwork was remarkable.

Fig. 1. Memory Containers at the abandoned olive processing plant of Sellasia.



## 2. REAL-TIME INTERACTIVE VIDEO MAPPING SOFTWARE

During the *Memory Containers* interactive performance and installation, archival visual material and contemporary footage were projection-mapped on physical found objects. The projections followed the movement of the objects, through a custom real-time projection mapping software. The software was built with opensource technologies, such as the *openFrameworks* C++ toolkit<sup>3</sup> and the *ArUco* library. The interactive computer vision interface consisted of a camera, a computer, a projector and a set of augmented reality (AR) markers attached to the rear surface of the found objects, which were used in the performance.

3. *openFrameworks*, accessed January 28, 2018. <http://openframeworks.cc/>

4. *ofxAruco*: openFrameworks add-on for marker-based AR using *ArUco*, accessed January 28, 2018.  
<https://github.com/arturoc/ofxAruco>.

5. *Applications of Artificial Vision*, accessed January 28, 2018.  
<https://www.uco.es/investiga/grupos/ava/>

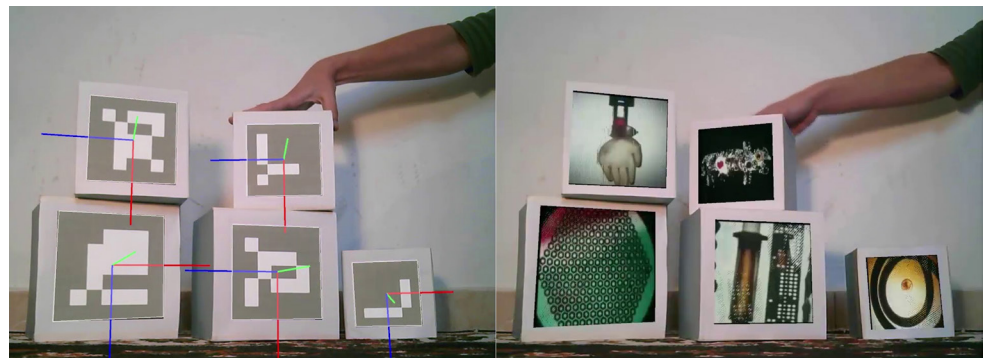
6. *ArUco*: a minimal library for Augmented Reality applications based on OpenCV, accessed January 28, 2018.  
<https://www.uco.es/investiga/grupos/ava/node/26>.

Fig. 2. Demonstration of the custom opensource interactive video mapping software.

Fig. 3. Found objects augmented with video projections. The objects belonged to the equipment of the abandoned oil processing plant.

The software received the input video stream of the camera, processed each frame in real-time and detected the AR markers. For this purpose, the *ofxAruco* add-on<sup>4</sup> was employed, which wraps the functionality of the *ArUco* library. The library is based on *OpenCV* and is developed by the *Artificial Vision Applications (AVA)* research group of the University of Cordoba.<sup>5</sup> *ArUco* detects squared fiducial markers in images and supports various dictionaries of markers (*ArToolKit+*, *Chilights*, *AprilTags*, *ARTAG*, *ArUco*), while it allows users to create custom dictionaries (*Applications of Artificial Vision* 2018; Garrido Jurado et al. 2014).

The camera used in the project was calibrated so that the library could estimate its pose with respect to the markers. This process was fundamental because it determined where the virtual information superposed to physical objects should be projected. The *ArUco* calibration board was used to calibrate the camera and calculate the intrinsic parameters (the focal length of the camera lens, the optical center of the sensor and the distortion coefficients) and extrinsic parameters of the camera (3D rotation and 3D translation). Each detected marker was an instance of the *Marker* class and provided access to the following properties: a vector of four 2d points (representing the corners of the marker in the image), a unique id, its size (in meters), and the translation and rotation that related the center of the marker and the camera location.<sup>6</sup>



The custom software used this information to determine the position and orientation of the projected videos. This way, a unique AR marker printed on paper and attached to the rear surface of each object was used to video-map dynamic projections on the object. The mapping was interactive as the projections followed the 3d position and orientation of the physical object, according to the real-time data provided by the AR markers.

The camera was placed at the rear part of the performative space, facing the audience. The markers positioned at the rear surface of the objects were invisible to the audience and could be captured by the camera. The projector was situated at the frontal part of the stage so that the video projections were projected on the frontal surfaces of the objects.



### 3. INTERACTING WITH THE ARCHIVE

The photographic archive of Sellasia included a variety of photos covering a broad period of the life in the region. The older photos were dated back to the first decades of 20<sup>th</sup> century. The images depicted the everyday life of the villagers, as well as special occasions. The archive included pictures of traditional houses of the village, the families living there, men working in construction projects, women attending classes of handicrafts, marriages and other celebrations. It also included photographs of the school, the students and the teachers, the central square and the cafes located there, immigrants descending from Sellasia, together with their travel documents, even sketches of the family trees of some of the local families. Similarly, the contemporary audiovisual material depicted locations of the village such as the central square and the cafés, the mini market, the school, the olive grove and the olive processing plant. It also figured the inhabitants of the village during their daily activities, their working routine and their leisure, such as the gathering at the café or a course of traditional dances.

Fig. 4. Photos from the photographic archive of Sellasia, courtesy of Mr. Ioannis Kapetanakis.



During the exhibition, the digitalized archival images and contemporary footage were visualized simultaneously in a dynamic and interactive way. The interactive nature of the project allowed the manipulation of the visual content in real time and the establishment of new associations between past and contemporary images, which opened the material to new interpretations and forged the articulation of plural narratives.

The contemporary footage can be perceived as part of the archive, if we consider the archive as an open, dynamic structure — an on-going process — rather than a closed static entity. This dynamic process allows the artists and other participants to provide new entries and constantly enrich the archival material. In the digital era, the archival material becomes more fluid, easily transformed and updated. Past records, once digitalized, enter the realm of permanent reconfigurability of digital data, thus providing “different ways to hack into these digital memories.” (Ernst 2013).

In *Memory Containers* project, physical and digital elements create a non-hierarchical network of nodes open to reflection. The juxtaposition of different temporalities allows participants to revisit history and reexamine its relation to the present (Panagiotara and Tsintziloni 2015), while they reflect on the socio-political parameters that influenced the life of the local community during the last decades. The visual elements appear as augmented physical objects that can be rearranged dynamically in

Fig. 5. *Memory Containers* at the *Onassis Cultural Center* in Athens, performed by Katerina Toumpa and Nirit Rechavi.



#### 4. D.I.W.O. PRACTICES AND COLLECTIVE ARTISTIC PRODUCTION

Short time artistic residencies constitute a fertile ground for the development of intense collaborations and peer enactments. In particular, Koumaria residency takes place in an isolated rural region, where interactions with local agents are encouraged. Creating with restricted resources — equipment, internet access and time — was challenging and reinforced the necessity to collaborate and share knowledge and materials. Under these perspectives, the production and development of the projects followed D.I.W.O (Do-It-With-Others) practices, where “a rich mixing of components from different sources crossover and build a hybrid experience.” (Garrett 2012) The projects had the form of open experimentations where the emphasis was placed on “the creative process and its socially empowering dimension rather than the final artefact/event or its signification.” (Koutsomichalis and Rodousakis 2015) Moreover, collaboration expanded from everyday household tasks to artistic creation, resulting in an interesting fusion between art and everyday life.

Manolis Manousakis, co-founder of *Medea Electronique* collective, introduces the term *Temporary Symbiotic Collective Art Process* to describe the mode of production applied to the projects produced during the *Koumaria* residency. “*Temporary Symbiotic Collective Art Process* is an art production process that takes place in a short period of time involving a number of artists that choose to live together in order to work on a common project. [...] Within this short period of time the artists are called to develop complex communication skills, eliminate their own personal identities and aesthetics and reconstruct their art making by involving themselves in a collective environment.” (Manousakis 2016).

These collaborative practices and collective processes could transcend the boundaries of artistic residencies and can form a more generalized paradigm of artistic production. Collective production and D.I.W.O practices provide pragmatic solutions to budgetary limitations and can render artistic production affordable in economies in recession. (Koutsomichalis and Rodousakis 2015) Especially in cases of interdisciplinary new media artworks, that involve numerous artists and professionals, the

Fig. 6. Resident artists collaborating with the local community (left) and with *Medea Electronique* collective members (right).



formation of collectives is often essential. (Manousakis 2016) According to Enwezor (2004), “Collectives tend to emerge during periods of crisis; in moments of social upheaval and political uncertainty within society. Such crisis often forces reappraisals of conditions of production, reevaluation of the nature of artistic work, and re-configuration of the position of the artist in relation to economic, social, and political institutions.”

Particularly in the case of Greece, the recession of the economy fueled the rise of the D.I.W.O movement and workshop culture (Koutsomichalis and Rodousakis 2015), which were proved sustainable in the new economic conditions. According to Koutsomichalis and Rodousakis (2015), this workshop culture resulted in a shift from “(Not-)Doing-It-Yourself to Doing-It-(Cheaper)-With-Others.”

## 5. TOWARDS A CONCLUSION

The paper introduced the *Memory Containers* project and discussed issues related to the production and exhibition of the project. It reflected on ways to engage a broader public (audience, artists, local communities) to the creative process both during the exhibition of the project (through user interaction) and during the production of the project (through D.I.W.O practices).

The digitalization and the interactive exhibition of archival material provided wider access to the archive and created opportunities for active engagement of the audience with this material through tangible and embodied interaction. The interactive exhibition opened the archive to new interpretations and questioned its static nature. The archive became an open process rather than a fixed entity that involved the audience to performative enactments and archive-making acts, which further enrich the archival content by creating new records.

Artistic projects often take advantage of the obscure traces of the archival material and the discontinuity of the stored elements, which offer opportunities for articulating narratives that give meaningful coherence to the stored data (Ernst 2004) and reveal the “unfulfilled beginnings or incomplete projects-in art and in history alike-that might offer points of departure again.” (Foster 2004) The production of new entries is often equally important to the reappropriation and reuse of past records. Performative arts can facilitate such processes in various ways, such as the process of ‘performative archiving,’ a dynamic process of archive-making which evolves in the present, receiving archival entries which are readily available for editing and further uses. (Kouros 2012)

Through the dynamic projection mapping software, the digitalized archival material acquired a physical dimension creating an interactive memory/narrative space. In this space different temporalities, events or memories were decomposed into their (non-hierarchical) constitutive elements and laid open to user interaction. (Weinbren 2003) This way the audience and the performers were able to rearrange the physical objects and the digital memories dynamically, providing the opportunity to suggest “connections and reflections on the past, or make it anew, in order to avoid conformism and to propose new engagements and relationships between past and present while forming a sense of sharing or community.” (Benjamin 1968).

