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# Video Mapping Applications in the New Media Art

Evrim ERGUN<sup>1</sup>, Erdal AYGENC<sup>2</sup>

## Abstract

In today's world, as like in other fields, art is associated with digital world and evaluated within the definition of 'New Media Art'. 'Installation art', which left behind galleries and the museums, was revealed and the concept of 'video installation' has been on the agenda of artists and graphic designers, with the use of the screen and the moving picture. The use of video mapping technique has incorporated in videography used in installation art over time. The aim of this study is to explore video mapping applications, which can be recognized as alignment of moving images simultaneously on real objects. Within the scope of the research, the place of video mapping in today's new media art, production forms and artworks produced with this technique were examined. Also, the techniques and software programmes to create these pieces of art were explored. In addition to the analysis made, some video mapping applications using mobile applications and other architectural applications, which are part of today's popular cultures, were given as examples.

*Keywords:* new media art, video installation, video mapping, mobile applications.

## Introduction

With the development of technology, many new concepts such as internet, social media and virtual world have started to be formed and it can be observed that these concepts lead to social and cultural changes in society (Goldsmith & Fonseca, 2014). Developments of technology and its subheadings raise its effect over communities. Those effects are transparency, increasing role in society and ubiquitous participatory, rise of communication and an increase of interactivity in every field of the community. Reflexive empowerment of social media is an enabler of grass-root community collaboration and the new relations of physical and virtual worlds. This highlights the idea that practices induced by social media, will get

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more common in daily environment, and that virtual and physical worlds will be more and more interlinked (Ahlqvist *et al.*, 2008). The invention of computers and the development of modern computers in the middle of the 20th century reveal the emergence of the concept of 'New Media'. "...the popular definition of new media identifies it with the use of a computer for distribution and exhibition, rather than with production. Therefore, texts distributed on a computer (Web sites and electronic books) are considered to be new media; texts distributed on paper are not. Similarly, photographs which are put on a CD-ROM and require a computer to view them are considered new media; the same photographs printed as a book are not" (Manovich, 2001).

As mentioned by Manovich, any kind of data in computer content is accepted as new media. In this context, the definition of new media, the voice of media technologies, the introduction of moving images and the translation of the entire existing media into numerical data emerges; at the same time, it is used to describe all forms of production, distribution and communication via computers (Cultures, 2005). In short; new media art is born from the unification of arts, technology and media fields, and the new definition refers to different methods, not from a new art form, but from a new medium (Tribe, 2006).

There are many contemporary art disciplines created with digital methods such as digital art, internet art, interactive art, virtual art, computer graphics and animation, video art, video installation, video sculpture and video mapping (Graham, 2010). Such disciplines of art, form new forms of production by using new generation technological developments (Melin, 2009). Thus, the new media accelerates the development of art with the advantages it provides in terms of information access and communication, thanks to the tools, materials and features it uses. This kind of art was created after a kind of steps (Bishop, 2012).

Today it is observed that the works produced with new media facilities are mostly focused on participant and interact with the audience. This situation, defined as interactivity, has a very important place in the new media art (Strehovec, 2009). "New media is interactive. In contrast to traditional media where the order of presentation was fixed, the user can now interact with a media object. In the process of interaction the user can choose which elements to display or which paths to follow, thus generating a unique work. Thus the user becomes the co-author of the work" (Manovich, 2001). As Manovic mentioned above, in the new media the user can interact with the media object. Therefore, this is also true for the new media art. It seems that the basis of the concept of interactivity is based on the art of installation that emerged in the 1970s (Barry, 2006). The art of installation, which played a big role in the development and change of the relationship between the viewer and the artistic artifacts and erases the gap between them, has become a trend where the boundary between the artwork and the viewer in the traditional sense has melted and concepts have begun to intertwine in space. In other words, art has come to a position meeting with the viewer as a result of the interaction of the concepts of "audience-space-object-subject-time" (Rafaeli, 1988). The concept

of *video installation* has emerged with the addition of video technology to this process where space and art objects are exhibited together (Kaye, 2007). Bego M. Santiago's "Little Boxes" work (see *Image 1*), which formed with the participation of the arts viewer, is an example of interactive video installation using video mapping technique. Wooden boxes placed in independent positions were used in the study; the images taken in advance were reflected on the wooden boxes. The actors involved in the images change their position according to the movements of the viewer. In this work, a narration was created with the sounds that change according to the movements of the viewer (Cardoso & Sena Caires, 2012).



*Image 1.* Bego M. Santiago's "Little Boxes" work, Source: (Santiago, M, 2017)

### *Use of digital technologies as media*

Installation, film, video, video mapping, animation, Internet and network art, software are new media technologies in art and do not have a very long history, the production of digital art is a digital platform until the presentation. These types of art, presented in digital format can be interactive and dynamic (Tardieu *et al.*, 2010). While digital art forms use technology as an "environment", this environment's possibilities and features reflected as art with new techniques for artistic purposes like in graphic design (Saglamtimur, 2010).

### *Virtual Reality*

Virtual reality is regarded as the creation of a three-dimensionally traceable art space, created on a computer, providing an interactive environment that gives

viewers a sense of reality. Virtual reality, which has become widespread as a subject in exhibitions and films, offers the possibility of reaching and navigating in an unreal three-dimensional space. It is used for scientific purposes in areas such as virtual reality, medicine, and engineering, which find more application opportunities especially in the game and entertainment world (Virtual Reality Society, 2017).

Artists present a new category of reality by filling the void of the virtual environment with unreal objects. Jeffrey Shaw, pioneer Canadian artist Charlotte Davies in virtual reality, three-dimensional image, actionable cinematography and Jeffrey Shaw, leading figure in interactive narration, Agnes Hegedus, who focuses on electronic media, and Tamiko Thiel, who uses interactive 3D virtual reality while dealing with social and cultural issues are leading figures in this digital art which is part of graphic design (Reality Technologies, 2016).

The user and viewer should be able to go where he or she wants in this environment which was created by the computers, that is, feel that control is in his or her hands. Thus, artists like graphic designers uses virtual reality technology computers with high performance and advanced graphics power, electronic titles (Fox, Arena, & Bailenson, 2009). The so-called extended reality system is basically composed of a built-in pointer, a tracking device and a portable small computer. Thanks to these enhancements, information about human movements is instantly transmitted to the computer, or the participant can feel himself in the environment, including touching, feeling physical features and hearing the sounds in the environment. In this way, a three-dimensional world in the computer environment is created (Erkartal & Okem, 2015).

## Methodology

Video mapping is a new type of art in graphic design and in digital art. It is a way to be used for better communication and expression as an alternative way to traditional methods. The aim of this study is to present this piece of art work and the concept of video mapping as the newest projection method and this paper also examined some works with reference to video mapping used in mobile applications and video games which were available in social media. Also, graphic design computer programmes and software were explored as the graphic design necessities for video mapping.

### *Video mapping*

Digital art has expanded and accelerated the concept of creating moving images and motion pictures using electronic software using computer software and hardware. In many exhibitions, art works like films we have watched in recent

years, there has been a significant influence on the animation, television advertising and video production of digital arts that pushes the boundaries of imagination and redefines it (Nitsche & Str, 2007). Digital art was born as a consequence of the computer revolution which was realized by the development of computers and graphics processing software, and it attracted attention as a formation that tried to establish and develop the rules, expression forms, characteristic features and ethical values in time as in other art branches (Prince, 1995). Therefore the importance of graphic design and graphic designer in digital world has become a necessity. Due to its proximity to sciences such as digital art and graphic design, it has changed the concepts of art, artist and work of art. Computer technology not only transforms the traditional forms of art such as print, picture, photo, video, music and sculpture but also ensures that all new forms such as internet art, software art, pixel art, digital exhibitions and virtual reality are accepted as artistic works which are all touched by a graphic design software program or by a graphic designer (England & Fantauzzacoffin, 2013).

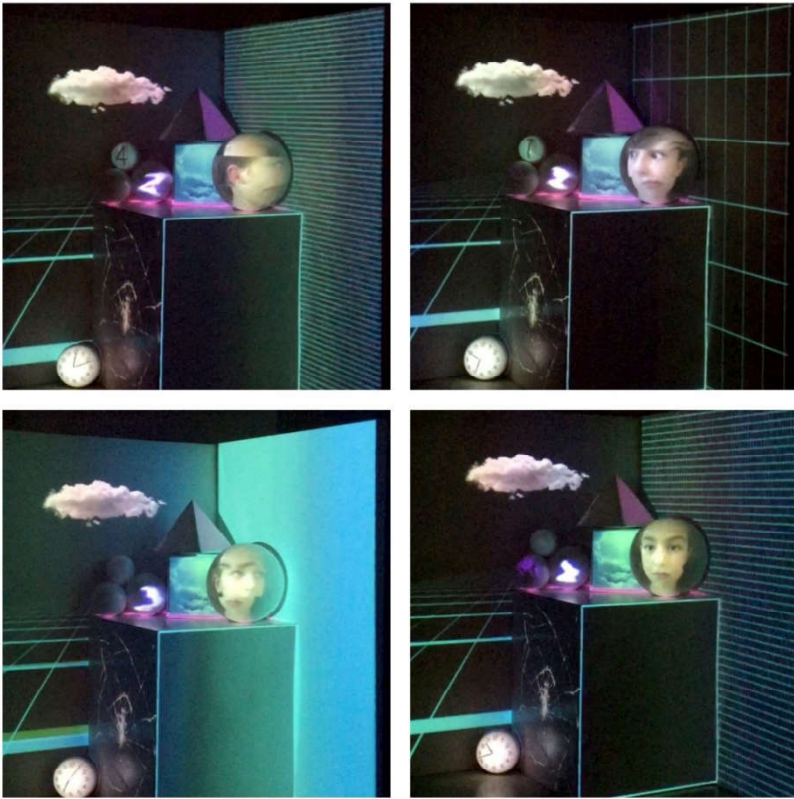
These video mapping applications were created after certain steps: (1) the theme was selected, the place, and all cultural aspects were taken into consideration; (2) Locations to be presented were selected; (3) Then the necessary computer programmes were chosen; (4) Then graphic designers as artists or as assistants work on the art; (5) The art was presented to the public (Boden & Edmonds, 2009).

Video mapping is the latest video projection technique used to convert any surface to a dynamic video screen (Bamberg, 2003). Atiker, describes video mapping as a technique in which moving images are projected through a few projectors in one place. Although the method of reflection mapping is basically the same as that of cinema, the difference is that reflection is aligned on three dimensional surfaces instead of cinema curtains (Atiker, 2015). Video mapping technique was developed by researchers such as John Underkoffler, Oliver Bimber and Micheal Naimarki at the beginning of the 21st century, and started to find its place in many different research fields (Jones, 2017). It has been used widely in research and development projects, military training programs, interactive training etc. fields, entertainment and promotional events, advertising campaigns, stage designs of concerts respectively (Nitsche, 2007). This has been added to a wide range of uses, with innovative ideas in art, design and installations. The goal of video mapping is to create a physical illusion by combining visual and auditory elements. Watson (2013) explains the video projection match, which is briefly referred to as *VPE*, as follows: "It is a projection technique that forms to create a city view (architectural spaces, buildings, facades, etc.) or any 3D object buildings, cars, trees, etc.) where the shape perception changes in order to create a connotation and / or transmit a message by means of a visual illusion of the 3D moving graphics and / or video images". It is seen that there is no limit to the surfaces that the images can be projected on, and the artist can use any three dimensional surface suitable for his purpose as *screen* or *curtain*. This, in turn, provides rich possibilities for artistic creation" (Watson, 2013).

Video mapping is a practice that takes place in several stages and requires a production. The first stage is the design and production part. In this phase, 3D modelling, video editing, motion graphics and so on were carried out by software in computer environment. The next step is the selection of the objects to which the image is to be projected. Projections with high lumens should be preferred if the distances of the objects are long. The creation and placement of software and installations of sound systems according to the nature and characteristics of the project are other stages (Boitard, Cozot, & Bouatouch, 2016).

The *Image 2* work produced within the scope of the research was created by video mapping technique using mobile applications defined in new media technologies. As the equipment, projection equipment, tablet and composition elements to be reflected are used (Albayrak, 2017). In this study, the relationship between projected image, matching object arrangement and space is supported by viewer presence. The power to change the everyday realities of perception of the geometric prism used is the prominent part of the work. In order to emphasize narration, it is aimed to support the concepts of time and space with music. In video installation, the interpretation that adds to the object is more important than the process it creates in the physical sense. In this context, the meaning of the object which was given by the artist is the general part of the work and is perceived as a whole. The real object (three-dimensional work) is integrated into the image and reaches a new form (Boitard *et al.*, 2012).

Today, professional software such as Adobe After Effects, Autodesk Maya, 3ds Max, Maxon Cinema are used to produce images in areas such as animated graphics and animation. A new mobile application, called *Vonzai* program (produced by Kreatin Studios), which almost anyone can easily access, was used in the (Kawakita *et al.*, 2004). Once you have prepared these types of videos, you need to use different programs to reflect the specified surfaces. For example, the software called Video Projection Tool allows the user to match more than one video to the specified surfaces in mapping works. Other examples of professional software such as *The Mad Mapper* which is used in mapping works to be reflected on architectural works, *Resolume Arena* which can work in a synchronous mode with music which is Virtual Jockey (VJ) software and Millumin plug-in software which works in Adobe After Effects program can be given (Taylor, 2007). In this study, video mapping application named *DynaMapper* developed by a company named Reo-Tek working on similarity, interactive presentation and exhibition arrangements in Turkey was used. Mobile applications, which are now part of social life, are designed in such a way that users can easily perceive and apply them and serve with tools such as smartphones and tablets in daily life. The aforementioned vehicles, which are renewed every day, provide ease of use in terms of ergonomic factors (easy to carry, no need to be attached to a fixed position, etc.) (Morris *et al.*, 2007). In this study, mobile applications were used which are simple but provide effective plastic solutions.



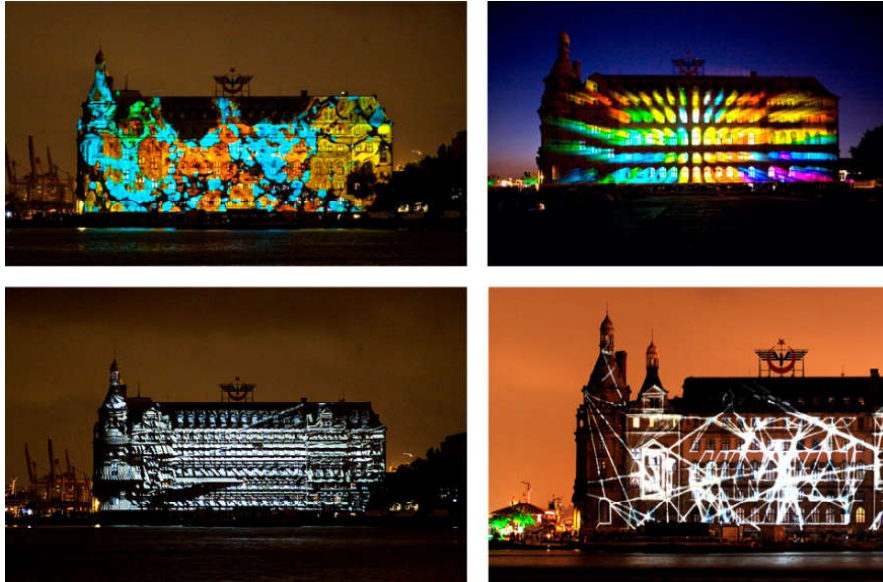
*Image 2. Video Mapping Technique Using Mobile Applications, Source: Albayrak (2017)*

### *Video mapping examples*

Video mapping is a practice that takes place in a few stages and requires a production. This technique, which uses projection, computer and camera in the basic production principle, occurs at certain stages. The first stage is the design and production part. In this phase, the work is carried out by software like 3D modelling, video editing, and motion graphics and so on. The next step is the selection of the objects to which the image is to be projected. Video mapping, which evolves as a demonstration on architectural spaces, is important in that it must be



perfectly matched with the area surface, that is, the window, relief, or column on the surface of the building where the moving image is projected. For example; The Nerd working team's work in Haydarpaşa Branch, 'Urban Screening', can be shown as a good example of video projection mapping application (*see Image 3*). The study was made by projecting the image of Haydarpaşa Station building, which was modelled by various 3D software in computer environment, with high lumen projections on the exterior of the same building. The presence of sound-supporting visual effects also makes visual fidelity stronger (Ekim, 2011).



*Image 3.* Yekpare reflected on the surface of Haydarpasa Train Station (Evren, Bogac, 2017)

Therefore, it is possible to make illusions between the real image and virtual one with the advanced technology by using these kinds of applications. This visual world can create an area with potency to produce infinite different models. The video projection mapping applications are not only limited to the outdoors but can also be displayed as a visual display in the interior. For example; in commercial and cultural public spaces such as theatres, cinemas, museums, entertainment centres and shopping centres.



Image 4. URBANSCREEN SOLANUM; Source: URBANSCREEN SOLANUM (2017)

This work, named *Solanum* (see Images 4 & 5), designed inside the JW Marriott Hotel in Houston, consists of layered items that form an organic pattern sprouting from the texture of the underlying tile. With its vibrant and rhythmic animation with gentle movements, it invites its guests to watch this magical game. In this art piece, natural and artificial materials were combined with layers of digital images, resulting in confrontation as a relief intersecting at a point between virtual and reality. The definition of “virtuality” is a concept that helps to conceptualize what is real. The virtual architectural spaces created by video mapping present the viewer in the interaction of virtual and physical space, while the viewer is a situation that completely isolates the physical space and takes place in the physical space. The use of virtual and real space has created hybrid situations that energize multiple senses with a combination of sound and vision, enriching the experience of the space.



*Image 5.* URBANSCREEN SOLANUM: Source: URBANSCREEN SOLANUM (2017)

One of the most important video mappings in public outdoor areas is the work of the Spanish artist Jaume Plensa named ‘Crown Fountain’ in Chicago (see **image-6**). The water pool designed by the artist consists of 2 pieces in 15 meter length. Towers made with the fund donated by the Crown family are made of glass bricks and form a very important example with the conceptual content. In order to be projected on the led-screen of the workshop, the artist took a video of 1000 of Chicago’s people, and every 5 minutes, randomly selected videos, the fountain-like waters coming from the mouth like mythological sculptures, a shallow but brilliant pool (City of Chicago: Millennium Park - About the Artist, 2017).



*Image 6.* Crown Fountain; Source: Chicago Crown Fountain - Interactive Video Sculpture (2017)

## Conclusion

In recent years, new media products and users are increasing and so is the interest in the field. Parallel to this, art blends new media technologies with their own norms and uses them in a new formation. In this new environment, artists take the advantage of technology to get out of the mold and find new solutions to their problems. Every kind of technological development is updating the previous situation and creating a ‘new’ situation as a step forward. It incorporates innovation, development, change, and speed, and it instantly outdoes the ‘newness’. The rapidly developing new media art is also consumed by using any new tool on the agenda. The resulting consumption and rapid displacement go into each other, leaving each other with new energy with strong momentum. In the process of rapid change, video mapping studies seem to be linked to conceptual art, which is a “concept” or “thought” based art movement. Therefore, one can say that the

most important element that the viewer has to possess in order to attract attention is the “concept” by using technology of a work of art. It can also be said that if a work produced using only new technologies does not contain a ‘concept’, the features of artwork are remote. As a result, with new communication technologies computer and internet, new media art which is regarded as a means of artistic production today, it has a very important place in today’s art and creates a centre of attraction for artists with its renewed facilities every day.

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