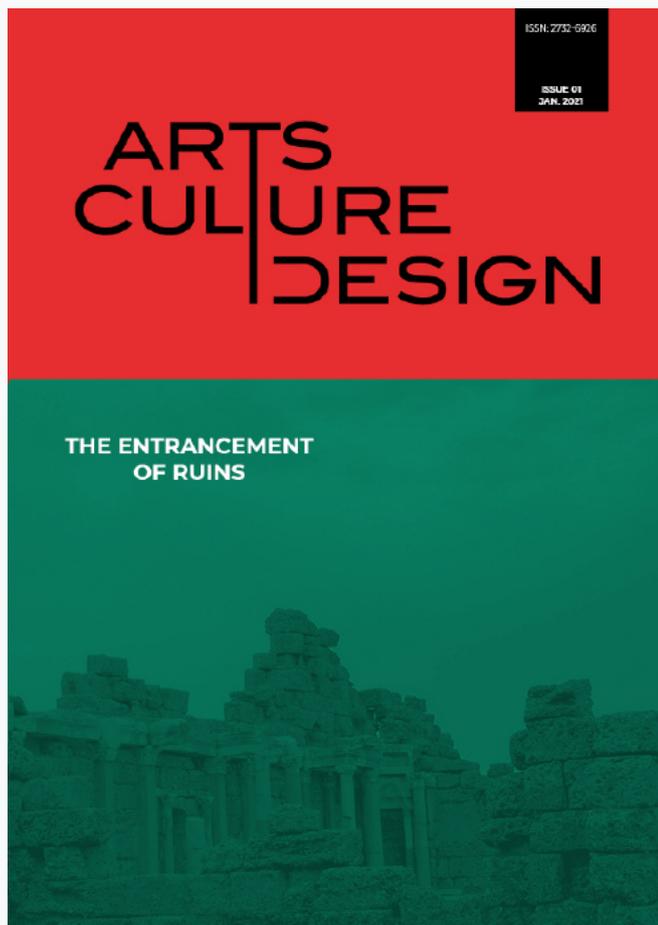


Design/Arts/Culture

Vol 1 (2021)

The Entrancement of Ruins



VIDEO GAMES AS TECHNOLOGICAL RUINS OF A RECENT PAST

Rossetos Metzitakos, Dimitrios Panagiotakopoulos, Marina Christodoulou

doi: [10.12681/dac.25904](https://doi.org/10.12681/dac.25904)

To cite this article:

Metzitakos, R., Panagiotakopoulos, D., & Christodoulou, M. (2020). VIDEO GAMES AS TECHNOLOGICAL RUINS OF A RECENT PAST. *Design/Arts/Culture*, 1. <https://doi.org/10.12681/dac.25904>

VIDEO GAMES AS TECHNOLOGICAL RUINS OF A RECENT PAST

Dr. Rossetos Metzidakos¹

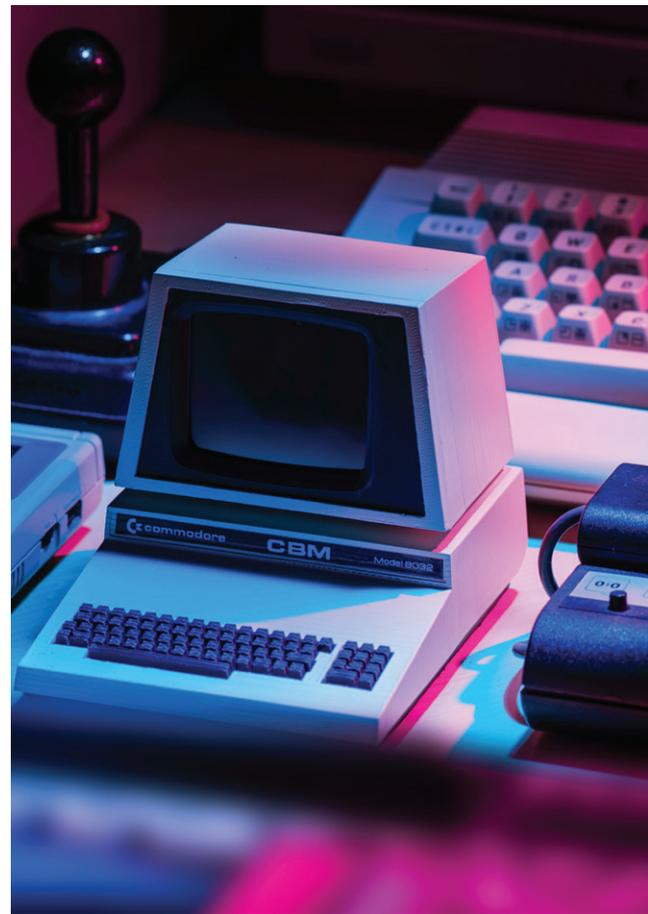
Doctor of Philosophy University of Central England, Author, Department of Graphic Design & Visual Communication, School of Applied Arts and Culture, University of West Attica

Dimitrios Panagiotakopoulos¹

Ph.D. Candidate, Author, Department of Graphic Design & Visual Communication, School of Applied Arts and Culture, University of West Attica

Marina Christodoulou

Master Student (Digital Humanities and Digital Knowledge) Author, Department of Classical Philology and Italian Studies, University of Bologna

**ABSTRACT**

The aesthetic cultivation of societal recollection is inextricably linked to the approach and preservation of the objects and the mnemonics that accompany them. This perception in modern society includes in its dormitories the historical evolution and retrospect of technology whose origins are pervasive in the realization of social impulses. Nostalgia and memories are no longer moved only through traditional ruins that reflect the aesthetics and sense of social development. In this context, it is important to examine whether video games nowadays can classify the early technological structures into the cradle of modern ruins, the evolutionary course of social memory. This article scrutinizes the multi-dimensional aspects of video games, approaching them as historical and technological achievements and identifying their aesthetic value as objects of the recent past that further stimulate quests lurking in this pixelated romanticism.

Keywords:

Video Games, Ruins, Aesthetics, Nostalgia, Social Memory

1. INTRODUCTION

Video games have been around for decades and are often at the forefront of computer technology, significantly influencing computer software and vice versa. In their short time of development, they have considered the newest means of storytelling. They constitute a global industry of 100 billion dollars, while two-thirds of American household members regularly play video games across various platforms, ranging from arcade systems, portable or non-portable home consoles to mobile devices. This huge playing time permeates everyday life, which subsequently this level of importance has led the academic community to explore video games, their potential, and their impact on the modern player (Video Game History, 2019; Barr, Noble and Biddle, 2007; Makai, 2018).

Video gaming origins are inextricably linked with the birth and evolution of computer technology. Electronic computer with the capacity of processing vast amounts of data is the science's primary instrument providing a new window into material reality compared to traditional instruments that promoted the reductive view of science (Waller, 1997; Frauenfelder and Bates, 2019). Various cognitive digital technologies are being developed in peoples' lives to better adapt to the environment as a basic form of relationship with the world through their widespread use (Gallese, 2020b). Human-Computer Interaction (HCI) has a crucial role in video gaming research (Barr, Noble and Biddle, 2007) with Quality of Experience (QoE) to relate HCI activity not only with the digital content (Graphical User Interface - GUI), but also with the device and the software, impacting the user perception (Beyer and Möller, 2014).

Technology can be considered a timeline of our reactions to the world, as it has helped us portray ourselves in the real world for millennia (Kac and Botelho, 1989). Video games as technological products gave birth to a mainstream culture that left a lasting impression on the world. Today the retro gaming era and the renaissance of past video games are quite revived (Frauenfelder and Bates, 2019). Today the retro gaming era and the renaissance of past video games are quite revived (Frauenfelder and Bates, 2019). Nostalgia is the unique combination of pain and pleasure of old objects

that serve as material reminders of a lingering past. Modern developers have returned to the video games' roots to produce new experiences with a recognizable independent aesthetic philosophy, unabashedly nostalgic for the reminiscence of older games (Makai, 2018). Virtual communities celebrate the old arcade video games while researchers look at various motivations to explain the nostalgia (Schivone, 2013).

It begs the question of whether video games can bring a feeling of nostalgia. There are multiple efforts from internet forums, popular podcasts, and video game history museums to give a clear and definitive answer to that question (Bowman and Wulf, 2018). Additionally, there is the view that natural or artificial ruins, as former utilities or aesthetic objects, could evoke our appreciation (Whitehouse, 2018) and nostalgia as well. This is well explained if a particular ruin is being connected with our past, but mysteriously ruins unfamiliar to someone's present can evoke the same impression. Similarly, as many others kept vigorously searching for magic traces on the ancient ruins (Grafton, Most and Settis, 2013), the feeling of unknown and unexplored ruins arose to the same "uncanny" detection.

Through his famous formulation of Three Laws, Arthur C. Clarke notes that: "Any sufficiently advanced technology is indistinguishable from magic" (Miró, 2018). Additionally, Johan Huizinga elevates "magic" in *Homo Ludens*, giving the metaphorical subsistence of the magic circle, the space-time, and the psychological boundary between games and the real world (Calleja, 2015). Reduced to today, the virtual and unified interface of the physical and digital world is a seductive addiction that transforms users on westernized desires for identity, autonomy, presence, and dominance with multiple personalities and consciously fluid roles. Similar to the epistemological implications of Virtual Reality (VR), the understanding of reality through illusions and the increasing immediacy with which users can understand and transmit three-dimensional (3D) information to the visual medium realizing that the virtual environment is unlike any kind of entertainment today. Western Platonic structures of knowledge and power successively constitute the loss of the "magic" and the charm of scientific supremacy (Waller, 1997). However,

the comprehensive conclusion's extract should be the coexistence and the intersection point of both transcendental and scientific perspectives.

In this article, we examine the process of portraying all video games as contemporary ruins or technological monuments of cultural and social memory. Through a multi-angle approach, video games leave a trace not only as technological and evolutionary structures but also as decomposed and asynchronous ruins of a short-term past. It is generally accepted that video games are by nature technological creations, but can they also be considered ruins? To tackle the question, four common elements shared between ruins and video games have been identified and approached. On the one hand, the aesthetics and technology either directly or not affect the ruin's condition. On the other hand, nostalgia, and memory could reduce the subsistence of a technological object to a ruin.

2. BACKGROUND

2.1. WHAT DIFFERS GAMING FROM VIDEO GAMING?

The "game" is a sociocultural metaphor, describing a wide range of procedural, semi-structured, and/or unrestricted activities. Games can include roles and re-structure existing physical or conceptual spaces, usually exchanging recreational, severe, and competitive experiences. There is a close relationship between play and games. Through playing, learning can interpret the gamer's multimodal subjective processes that otherwise could not be experienced in the physical world. Games are "closed formal systems" with "two-way representative relationships." The players' experience is based on personal decisions of the imagination's playful choices since a "safe" space is provided even in the wrong decisions without permanence (Dahya, 2012).

The game separates space from the "ordinary world," making it, according to Johan Huizinga, a step from real life into a temporary sphere of activity. Besides, all forms of games, whether human or animal, have rules, and following these rules

creates and maintains the "magic circle" (Calleja, 2015). A game has been defined as "a rule-based system with a variable and quantifiable outcome assigned with different values. The player makes an effort to influence the outcome while feeling emotionally attached to it, with the consequences of the activity being negotiable (Beyer and Möller, 2014). The expansion of Game Studies (Ludology) has renewed the attention for Huizinga's work, *Homo Ludens* (1955), which explains that as in other cultural objects, the act of game-playing requires crossing a boundary from the ordinary world, shifting the everyday and usual sense of identity players in their ludic self (lusory attitude) (Calleja, 2015).

Ludology was introduced by Gonzalo Frasca and is used to study mainly computer games, defining the structure (gameplay) of a game. Ludologists suggest a discipline that studies the game and playing activities while considering video games as games and not as narratives (Egenfeldt-Nielsen, Smith and Tosca, 2013). The rhetoric of Ludology emerged as a reactionary response to the one-dimensional rhetoric of narrative that video games (as narrative) were the ultimate goal of video game development. As Markku Eslinen concludes, computer games do not have to respect conventions and traditional boundaries inherited from oral or written narratives. This rhetoric focuses on the gameplay mechanics of video games, with Ludologists pointing to Tetris (1985) as an example of a video game without any narration, suggesting that games need not have any narratives (Williams and Smith, 2007). Video games are digital interactive art forms with limited controls and animated interface, following rules as games do. The continuous technological development introduces new categories and forms of video games. Video games stand out from computer games, requiring skill rather than complexity (Video Games, 2012; Drumwright, 2013; Bryant, 2012).

2.2 DEFINING RUINS

Ruins usually refer to abandoned, damaged, or neglected structures that are not

¹ Derived from the Latin *ludus*, *ludere*, the only one word to cover the whole field of play (Huizinga, 1949).

² HMD are the most popular desktop imaging devices, as well as the computer-controlled Head Worn

used for their initial purpose, marking attractively and picturesquely the passage of time or *memento mori*, inviting travel to an aesthetic adventure. They “survive” by evoking humanity’s achievements and interpreting fascination while keeping the past’s memory alive, ultimately to suggest their regeneration through new uses. The ruined structures are connected between nature, the built environment, and human activity, thus making their existence dependent on them (Whitehouse, 2018). The word “ruin” brings to mind ancient and archaeological enchanted monumental structures serving as instruments of aesthetic pleasure. According to the Concise Oxford Dictionary, a negative tone is related to the word: “To ruin is to inflict or bring great and irretrievable disaster upon, to destroy agency, to reduce to a state of poverty, to demoralize completely” (Pétursdóttir and Olsen, 2014). The ruins do not necessarily destroy the aesthetic experience, as many of them are part of the global human’s cultural heritage. Ruined structures can be more exciting or attractive through their destruction, something that does not happen in other art forms in general (Whitehouse, 2018).

Derrida understands the term as the living “phantom” between life and death. Heidegger gives the characterization of being of the dead as someone “still-remaining” and “unliving.” At the same time, Ruin goes against Derrida and Levinas’s criticisms and offers a new outlook as a being of death and grief (Piette, 2019). There were specific values to understand a monument as ruin throughout the nineteenth and early twentieth century. Artists and intellectuals could not classify their time’s mechanical works made from iron, concrete, and glass as ruins. They believed that these structures had no “destruction value,” and they could not disintegrate properly. They admired the archeological ruins of classical antiquity made of stone instead (Pétursdóttir and Olsen, 2014).

In the 21st century, in the modern ruins of urban wildlife, a logical paranoia has been embodied to mark the collapse, redefining the destruction of the future with fascination in the form of death (Lyons, 2018). Our perception of ancient ruins and recent ruins of the past is very

different. The ancient ruin visually comes to us “completed” with its aging process to be over. On the contrary, the ruins of the recent past have not reached this state, continuing the process of ruining as a state of intermediate in the present. A parallel can be drawn between modern ruins and the human body. The body, in its existence, starts from living and functional to end up as osteological remains. The conversion from the two situations is not attractive, and so are the modern ruins that are often in this “fluid state of material becoming” (Pétursdóttir and Olsen, 2014).

3. TECHNOLOGICAL TIMELESSNESS

During the 1970s, for creating engineering drawings—Computer-Aided Design (CAD) (the most critical information technology of the last millennium), a new form of graphical manipulation developed (Matheu, 2005). Since the late 50s, the field of computer graphics emerged with the development of computer graphics hardware. Ivan Sutherland of Massachusetts Institute of Technology (MIT) (and later the University of Utah) played an essential role in this process. He developed sketchpad software that allowed a user to draw simple shapes on the computer screen, and he invented the first computer-controlled Head-Mounted Display (HMD) in the mid-1960s (O’Regan, 2018).

With the then-existing technology, Nolan Bushnell (University of Utah) and Steve Russell started developing video games, while in 1971, Bushnell and Ted Dabney designed the first arcade video game Computer Space (by Syzygy Engineering). During the period of the arcade gaming establishment, amateur practices of a minor IT elite designed Do It Yourself (DIY) games, coding, and hacking. It was this elite that later founded the big game development companies. In 1972, Dabney and Bushnell set the foundations for the video game industry with the legendary Atari development. The incorporation Atari, Inc. has developed a range of video games such as Pong, Asteroids, Tempest, Centipede, and Star Wars (O’Regan, 2018; Makai, 2018). At that time,

³ HMD are the most popular desktop imaging devices, as well as the computer-controlled Head Worn Displays (HWD) devices, that are placed on the user’s head, displaying elements of combined images or video icons in the real or in the entirely virtual world.

home gaming consoles became popular, such as the Telstar console in 1976 by Coleco, and the Nintendo console, Color TV-Game, in 1977. Their popularity was so great that the first home console Atari 2600 (1977) with spare ROM cartridges sold 30 million units, while consoles such as Nintendo Entertainment System (1983) sold 62 million consoles and Sega Genesis (1988) sold 31 million consoles (Frauenfelder and Bates, 2019).

In the 1980s, home computers' popularity meant that players could play their games on their computers, such as the Apple II, Commodore 64, Atari ST, and IBM. Video games had not reached their trivial popularity until Nintendo released in 1989, the portable Game Boy, with 64 million sales, taking gamers outdoors to play (Frauenfelder and Bates, 2019). Nintendo aimed to create the first generation of kids-gamers, known now as millennials, who would grow up with video games (Christians, 2018). However, many technical issues were obvious to the user due to their internal architecture, driving the gaming experience to dissatisfaction.

The modernized architecture of consoles has allegedly solved all the issues. The game engine is the core of the game development and includes a renderer, scene structure, motion system, and collision system. Algorithms calculate and extract the final image. The quality of the design directly affects the Research & Development (R&D) of the game and the operation of the program. Instant 3D images on PC and game consoles are created using direct 3D engine functions (Su, 2018). Advances in graphics and audio technology combined with the speeds of today's processors, memory, and hard drives, have turned games into a powerhouse industry (Kelly, 2009). The rise of more sophisticated and complex video games created 64-bit systems and VR games. Video games have long been classified into computer games, console games (Xbox, PlayStation, Wii), mobile games such as PlayStation Portable, and online games in internet browsers. Many computer and mobile games also support online capabilities, such as cloud games, for coordination and interaction (Beyer and Möller, 2014; Schiavone, 2013). Video games as running software programs on computers are within the domain of HCI, a branch of computer science concerned with the design to implement interactive interfaces between peoples'

physical world and computers through Graphic User Interfaces (GUI) (O'Regan, 2018; Barr, Noble and Biddle, 2007; Abowd and Mynatt, 2000). GUI is a particular case of the User Interface (UI) for interacting with a computer and mobile devices, using graphics other than text ("Graphical user interface," n.d.), which had inefficiency associated with the user-centric experience. All aspects of information handling have been redesigned into icons. GUIs today are Windows, Icons, Menus, and Pointers (WIMP), allowing the screen to be divided into different areas, and each area is used for different tasks (O'Regan, 2018; "Graphical User Interface," n.d.; Ben-Hajji and Dybner, 1999). User Experience (UX) is an essential factor for digital applications and video games. For example, the subjective feeling of presence in the environment can be attributed to proper UX design in a programmed environment (Takala et al., 2015).

Unity and Unreal platforms democratized the game engine software, operating a new design form between architecture and games to design virtual worlds (Pearson, 2020). Artificial Intelligence (AI) is another technological aspect of video games since the very first video games. Advanced video gaming has increased the complexity and effectiveness of AI to make gaming environments smart by understanding a player's behavior and responding to stimuli. Call of Duty, for example, makes effective use of AI to analyze players' environments and actions (Naik, 2016). Additionally, there has been a growing interest in quantum information processing in recent years, developing quantum computer algorithms with a significant acceleration in computation time. For specific significant issues, quantum computer algorithms have been developed to speed up computing time. This technology will transform electronics to spintronics in the next millennium (Wolf, 2000), and probably the technology expansion will be observed in digital gaming.

4. THE DESIRE OF AESTHETICS

The term "aesthetic" appeared for the first time in 1735 in Baumgarten's thesis, entitled "Meditationes philosophicae de nonnullis ad poema pertinentibus" as the study of objects that are perceived through our senses (sensibly) instead of

the imaginary objects that are perceived independently of them (Parisaki, 2004). Aesthetics, as a philosophical theory, has an epistemological origin, and according to Kant, it is related to our ability to receive representations depending on objects. However, for the founders of epistemological aesthetics, aesthetic rationality is not synonymous with experience and empirical knowledge (Georgiou, 1989). Multiple theories had been formulated around the sense of “beautiful,” according to the various art movements that have emerged with a positive or non-positive critique of aesthetic views. If it is considered that the “beautiful” is subjective, then the “universal” is annulled into the realm of criticism and clarification because the creation becomes beautiful by its own creator. Various concepts such as “high,” “taste” and “emotion” were used by several philosophers and critics to formulate their own theory (Parisaki, 2004). The appreciation of art and beauty has also been examined by modern neuroscience proposing a different approach to vision with the motor system as a critical factor, revolutionizing the concepts of perception and imagination, showing the close relationship between action, perception, and cognition (Gallese, 2020a).

The application of applied aesthetics of the new media is not only examined by the traditional idea of philosophical criticism. In the light of understanding tangible or intangible objects that exist and could be called art. On the contrary, it provides concrete and reliable criteria for analyzing current means of artistic expression (Zettl, 1999). Some authors proclaim that video games can be considered art by supporting their artistic side, while others oppose such characterization due to the lack of “quality” (Sherrill, 2020). Although it is suggested that video games are aesthetic objects, at the same time aesthetic analysis does not have the potentiality to study games. However, if the analysis of aesthetics is excluded, then the result of their understanding may be shallow (Kirkpatrick, 2011). Based on the above analysis, it is reasonable to divide video games into two categories: the digital content where the user has visual interaction and the console as an aesthetic object. However, there is no critical framework and analytical tools to link video games with aesthetic boundaries. Scholars have made

attempts to approach video games from various academic fields such as semiotics, media studies, cultural theory, philosophy, and contemporary art analysis (Niedenthal, 2008).

The study of video game aesthetics is often degraded as the analysis of technology and graphic style gains ground. Digital games combine aesthetic, social, and technological elements, and thus arguments from philosophy, psychology, interaction design theory, and game technologies are proposed to be used to understand the aesthetic experience of the game (Niedenthal, 2008) and to allow them to be categorized and considered as an art form with different aesthetic analysis. Alternative to that, an individual video game could also be related to an artwork considering the user interaction and engagement with it. Any object described as art has to include some interaction with institutional factors and not absolutely to consider art due to their technical construction relating to form and material. These institutional factors are often associated with external aspects, such as video game violence, and thus, the aesthetic variety of the medium is rejected (Atkinson and Parsayi, 2020).

4.1. CULTURAL IMAGES AND MEDIA CONTENT

Both the expressive and cognitive theory of art claim that art communicates and transmits senses and emotions. The communication process involves two factors, the impression it causes and the capture that uses the image as a channel. Reading an image forms an interaction and is directly related to the pre-existing cultural context. Metaphorically, we would say that there is a visual and conceptual fluidity that combines different images' aesthetics and extracts cultural content.

Dewey claims that art is the best way to understand a culture (Atkinson and Parsayi, 2020). For instance, the ruins of the ancient Roman city of Pompei buried by the eruption of Vesuvius in 79 A.D (Della Lucia, Trunfio and Go, 2016) unveil visually the pleasures of the ruins of the city and its citizens. Simultaneously, a mosaic, such as that of the ambitious emperor Justinian in Basilica of San Vitale in Ravenna, Italy, leads to further historical complications. The church is a testimony of early Byzantine art with glosy mosa-

ics, sharply carved in traditional rhythms for the communication of the “eternal” in contrast to the mosaics of the classical era where 3D objects were imitated (Bell, 2008).

However, can an ancient fresco, a medieval mosaic, and a digital video game have something in common? Are they just images of the style of a period, or are there cultural links between them?

With the advent of industrial culture, the philosophy of modern and contemporary art was redefined, as well as Freud’s psychoanalytic theory around dreams and art. As a consequence, many scholars have developed new theories about new media aesthetics (Zettl, 1999). For example, a film’s aesthetic dimension is never separated from its perception, how it is socially implemented, and how it is accepted. It never exists without the influence of historical and cultural particularity. Cultural studies always suggest that a film, or expandingly new media and images, has its peculiarity, pleasures, and characteristics that can be limited to ideological “clichés” (Hill and Church Gibson, 2009). Visual communication moved from the realm of art to the industrial production of typography design, image, and content alternation (Kress and van Leeuwen, 2010) into a digital base.

This turn of the content does not end in the lack of aesthetic criteria and does not prevent the new ranges’ approach. On the contrary, it is given another perspective in approaching video games, not only as a means of entertainment and technological competence but also as a whole that offers multiple stimuli in the cultural context in which they are created and interact (Atkinson and Parsayi, 2020).

Concerning the video game as digital content, the aesthetics can be applied with sensory phenomena like the audiovisual and haptic stimulus. There is also the aspect of sharing digital game content with multiple forms of art. The context can be approached by the emotions expressed while the user experiences the game (Niedenthal, 2008). While video games were entering the public consciousness, technological limitations on primitive simpler graphics and sound effects with machine to machine violation could not compete the TV scenes until the graphics improvement in the 90s (Ferguson, 2013; Frauenfelder and Bates, 2019).

Another art history example that influenced art and games is the Japanese woodcut art ukiyo-e, considered the “ancestor” of Nintendo’s ‘80s games, as ukiyo-e has influenced many of these video games’ design decisions. It is believed that if video games like Super Mario Bros or The Legend of Zelda were designed in Europe or America, they would have a different effect than Japanese designers who, in contrast, used black pixel borders and color fills (Brownlee, 2013). For instance, Phantom Okiku by the Japanese artist Katsushika Hokusai belongs to the “One Hundred Ghost Stories,” influenced by the Monogatari game (Sumpter, 2004). The game’s visual representations passed through Japanese pop culture with the adaptation of Okiku myth to Sadako’s spirit of the Japanese film Ringu. The painted and the cinematic ghost have in common their drowning and coming out of the well with a common depiction of black hair. Sadako is closer to the Japanese tradition of evil spirits of supernatural stories that were not un-

³ Ukiyo-e (images of the flowing world) refers to the art of engraving and woodcuts. The woodcuts bearing the name ukiyo-e depict a flowing and ephemeral world. It has been a significant part of Japanese culture since the 17th century. Ukiyo-e prints were often used to illustrate books but gradually evolved into independent works adorned with hanging rollers or single prints serving as greeting cards and even kabuki posters. Matk.gr. n.d. Charaktiki - Mouseio Asiatikis Technis Kerkyras [Engraving (ukiyo-e) - Museum of Asian Art of Corfu]. [online] Available at: <<http://www.matk.gr/gr/sylogos/sylogoi-iaponikis-tehnis/thematikes-enotites/haraktiki/haraktiki/>> [Accessed 26 October 2020].

⁴ Lacking perspective and shading the stylized figures with flat surfaces of intense atmospheric color in eccentric placement, Okiku is shown with her dead body haunting the well where she was murdered because she broke a precious tableware (Sumpter, 2004).

⁵ The game has its roots in the religious ritual of the medieval period Hyakuza Hodan (One Hundred Buddhist Stories). In the Edo period, it was called Monogatari. The typical condition of the game was that friends would gather after dusk to tell horror stories. At the beginning of the recitation, they lit a hundred candles by blowing out one at each story’s end. In the end, they thought something terrible would happen (Sumpter, 2004).

⁶ Ringu. 1988. [film] Directed by H. Nakata. Japana: Ringu/Rasen Production Committee.

⁷ Tokugawa or Edo (1600-1868, present-day Tokyo) is the non-European art history depicting Edo’s folk culture. Undoubtedly, the period was marked by a cultural shift in the nation’s history after four centuries of bloody wars soaked in blood, establishing an era of peace that will last for two and a half centuries. Peace comes at the cost of strict laws that persecute expression, property, and behavior. The ukiyo-e attributes the grotesque of the time to a defective system soon to fall (Sumpter, 2004).

⁸ Cyber City Oedo 808. 1990-1991. [TV-series] Directed by Y. Kawajiri. Japan: Madhouse.

⁹ The Ring. 2002. [film] Directed by G. Verbinski. USA: MacDonald/Parkes Productions BenderSpink, Inc.

common in Edo . The aesthetic adaptation of the floating world's images was communicated in other modern Japanese media, such as *Cyber City Oedo 808* , but also in American media and cinema with the film *The Ring* . A type of integrated cross-media communication between the different media such as the film franchise with video games, comics, websites, and music is noticeable.

4.2. CONSOLES AS ART OBJECTS?

Video game consoles as objects are designed to look attractive and usually match the games they run (Sherrill, 2020). Simultaneously, the user can psychologically combine the console as a designable object, which makes him/her interact with satisfaction with the game, raising multiple stimuli that have to do not only with their material categorization but with its general informational dimension as well. Technological objects are the mediation between individuals and reality that creates what Francesco Casetti calls a “mediascape” environment (Gallese, 2020b).

Authenticity is considered a way of measuring the artistic “value”. Museums prefer to highlight the aesthetic and historical reasons for the value rather than the monetary value. Furthermore, in museums, there is a classification and hierarchy of objects based on “permanence”,

material permanence, but also permanence in the sense of cultural power. The idea of the “masterpiece” guides many collections and exhibitions, making some works seem more important in the history of art. So many works of art from some art forms that are not widely accepted as serious remain outside the museum (“Rodini,” n.d.).

An idea when implemented creates a type. Each time this type is repeated it forms a model. The noticeable difference between works of art and technological objects that can be aesthetic objects is that the work of art is a unique type, a unique model of authentic nature. In contrast, the mass production and industry to which the creation of video games belongs define the authenticity of all types and models of the consoles or video games that the production, sale, and recognition belong to a specific corporate brand. Thus, museums, although recognizing the artistic side of technological objects, do not promote them in equal positions with the unique and authentic originals of the artists.

However, globally there are museums hosting permanent or periodical exhibitions with video games. All these museums, such as the Vigamus museum, the first and only video game museum in Rome, the UK’s national cultural center for videogames The National Videogame Museum , or the Computerspielemuseum in Berlin and more deliver video



¹⁰ <https://vigamus.com/en/>

¹¹ <https://thenvm.org/>

¹² https://www.computerspielemuseum.de/1210_Home.htm

¹³ *Breakout* (1977), *Space Invaders* (1978), *Asteroids* (1979), *Galaxian* (1979), *Pac Man* (1980), *Defender* (1980), *Missile Command* (1980), *Donkey Kong* (1981), *Qbert* (1982), *Tempest* (1981), and *Galaga* (1981) (Frauenfelder and Bates, 2019).

games to everyone through studying, playing, and celebrating their culture in order to educate the audience for the evolution of a medium and inspire the next generation of video game players and makers.

5. NOSTALGIA AND RETROGAMING

Retro games fascinate by their simplicity juxtaposed to the complexity of modern games (Frauenfelder and Bates, 2019). Retrogaming is a general tendency of digital gaming and refers to the gaming practice and the collection of “classic” video games of the 1970s, the 1980s, and the early 1990s (Suominen, 2012). The trend of “retrogaming” has been revitalized by gaming companies to attract the new generation gamers with old gaming consoles and arcade machines as objects of nostalgia (Makai, 2018). Video games were mainstream between the 1970s and 1990s, while in the period between 1975 and 1981, a large number of arcade games were produced (Frauenfelder and Bates, 2019).

Retrogaming can also be defined as a cultural form due to the production of various commercial and consumer products, like music, accessories, literature while motivating the aesthetic expression of societies (Suominen, 2012). The era of retro games comes with the feeling of nostalgia, which is associated with immersion in memories leading to a mixed emotional state of positive and negative emotions. Hepper, Ritchie, Sedikides, and Wildschut (2012) found that nostalgia is usually connected to past events. Nostalgia can be triggered either by external stimuli or internally by feelings of psychological discomfort (Wulf et al., 2018). Arcade video games' inner nature made players feel satisfied even though these skills were obviously not useful in their real life. Finally, arcade video games provided social pleasure and social aggregation by playing simultaneously with two or three friends to the same videogame in the same space. Gamers were interacting with each other to master their video-gaming skills. This old social and gaming interaction is implicated today virtually for social groups in real life, like the flight simulators (Schivone, 2013).

Many research types prove that nostal-

gia plays a decisive role in people's lives, serving essential psychological functions (Hepper, Ritchie, Sedikides and Wildschut, 2012). Nevertheless, there is no empirical research for explaining the psychological effects and benefits of retro gaming (Wulf, Bowman, Velez and Breuer, 2020). According to Wildschut et al. (2006), nostalgia's first function relates to a positive affect, while participants feel nostalgia to alleviate their negative mood. Nostalgic memories protect against threats, while it also repairs feelings of loneliness. At the same time, the feeling is related to the existential concept. Thus the scientific findings suggest that nostalgia has short-term and long-term benefits that repair aversive states (Hepper, Ritchie, Sedikides and Wildschut, 2012). As mentioned in the introduction, many wonder if video games can invoke nostalgia. The game characters of the past may invoke nostalgia for players. It is believed that a “friendship” relationship can be created between them. Another hypothesis is that game characters could be considered as an extension of the players' selves. In a research survey conducted by Wulf et al. (2018), 582 participants reported stronger feelings for older memories than recent ones. Several responses were linked to childhood memories, including family and friends (Bowman and Wulf, 2018). In general, external stimuli, such as multimedia content and objects of another era, cause nostalgia. In video games, the emotion is activated when the person watches or plays past media content. Research has initially focused on the negative aspects of emotion, while research has recently focused on the positive value of emotion. The relationship between nostalgia and well-being has also been suggested by Routledge et al. (2013) but without empirical testing of video games



(Wulf, Bowman, Velez and Breuer, 2020).

6. SOCIAL MEMORY AND VIDEO GAMES

Memory as a mental ability has two different processes, one related to the “re-constructive process,” while in a cultural sense, multiple

layers like “social memory,” “material or medial memory,” and “mental or cognitive memory” are associated with cultural memory (Tanovic, 2015). The constructed identity of a place results from the human capacity and identity, reflecting a plastic memory of depersonalization and an alienated place lost from its identity (Guimarães da Costa, 2018). People have more digital media collections about their past by memorizing digital video, audio, and even olfactory or tactile elements (Hoven, Sas and Whittaker, 2012). The HCI community has considered the potential of digital technology for memorization. The concern that “digital memorabilia seems to lack salience” due to digital media invisibility compared with physical media seems to be less important. The memory continues its bonds through narration

and memorization, where storytelling communication requires the narrator, the subject, and the audience. “Dead” memories are being captured by digital storytelling (Ataguba, Penrice and Shearer, 2017; Hoven, Sas and Whittaker, 2012) using the interaction of digital technologies and the culture of digital memory, which are consistent with important personal information of social life. Portable digital devices assist, except communication processes, in recalling personal memory through the concept of “mediated memories” or “personal cultural memory” (Sebald, 2018). Cultural memory portrays our self depiction. Images of the past produce a present collective identity and memory. Thus, society has a self-image, recognizable as a memory, that consists of its identity. Digitization makes memory materials readily available to anyone, anywhere globally, making them belong to everyone, theoretically promoting the radical democratization of memory (Blom, 2017). Referring to video games, a digital reconstruction of reality based on social memory comes true. Different asynchronous seemingly aspects produce a parallel personal collection of memory in the user, like the one created by the real world.

CONCLUSIONS

It is not enough for something to be objectively characterized as “beautiful” to have aesthetic, but it must offer an eternal experience of enjoyment, satisfaction, and meaning, including artistic currents, personal experiences, thoughts, and character. It consists of generalized indulgence and, at the same time, the unique differentiation of the superficial with the essential. Historically, the console design did not work only in practice; it created an idea and a feeling in the user for the content itself, always integrated into the level of cultural adaptation. The duality includes its physical, material existence, which is involved in collecting what follows the real world.

On the other hand, the console itself creates a digital, dreamy environment in which new memories are shaped and included in the console's personal digital memory collection, allowing the player to recall these memories and see them presented in front of him. A possibility that the real collection of memories cannot offer. So the player not only collects moments of the console's real existence that can also act as emotional points or aesthetic ruins of an old past but also generates a parallel personalized digitized collection.

Ruin can be anything, but always this ruin for some offers memories and nostalgia, while for someone else it is the dimension of the mystery, the “uncanny”, something in which history is hidden behind the remnants and waiting to be discovered. Consoles work in the same way, whether they are remnants of a real but lost past or a source of inspiration and mystery for someone who has never known this past. The aesthetics in this technology is everlasting. What we consider modern today in the future will also be characterized as retro. However, will they have the same aesthetic value? Will consoles of today be able to evoke the same emotions as these of yesterday? Will the rapid pace of technological developments allow the same aesthetic and emotional consolidation of modern games to be retro, or will the already retro consoles remain on the same pedestal? Whether hidden in drawers or standing as collection exhibits, they “carry and feed” cultural significance. Retro game models are timeless, either as part of the existing gaming production or as points of inspiration for the design. Nevertheless, the sense of nostalgia and mystery of a recent but forgotten past is what makes them ruined remnants of it.

ACKNOWLEDGMENTS

We gratefully acknowledge the help of Antonios Andreou for his helpful and insightful comments.

REFERENCES

- Abowd, G. & Mynatt, E. (2000), 'Charting past, present, and future research in ubiquitous computing', *ACM Transactions on Computer-Human Interaction*, 7(1), pp. 29-58. <https://doi.org/10.1145/344949.344988>
- Ataguba, G., Penrice, S. & Shearer, J. (2017), 'Exploring Storytelling for Digital Memorialization'. In Zhou J., Salvendy G. (Eds.), *Human Aspects of IT for the Aged Population. Applications, Services and Contexts*. ITAP 2017. Lecture Notes in Computer Science, vol 10298. (pp.103-113.), Springer, Cham. https://doi.org/doi:10.1007/978-3-319-58536-9_9
- Atkinson, P. & Parsayi, F. (2020), 'Video Games and Aesthetic Contemplation', *Games and Culture*, pp. 1-19. <https://doi.org/10.1177/1555412020914726>
- Barr, P., Noble, J. & Biddle, R. (2007), 'Video game values: Human-computer interaction and games', *Interacting with Computers*, 19(2), pp. 180-195. <https://doi.org/10.1016/j.intcom.2006.08.008>
- Bell, J., (2008), *Kathreftis tou Kosmou: Mia Nea Istorია tis Technis* [Mirros of the World: A New History of Art], Athens: Metaichmio, pp.79-80, 94. ISBN: 978-960-455-605-2
- BenHajji, F. & Dybner, E. (1999). *3D Graphical User Interfaces*. Thesis. Stockholm University and The Royal Institute of Technology.
- Beyer, J. & Möller, S. (2014), 'Gaming'. In Möller S., Raake A. (Eds.), *Quality of Experience*. T-Labs Series in Telecommunication Services. pp. 367-381. https://doi.org/10.1007/978-3-319-02681-7_25
- Bowman, N. & Wulf, T. (2018), *Retro Gaming is so Popular Because of this Psychological Reason*. [online] Inverse. Available at: <<https://www.inverse.com/article/48459-finding-nostalgia-in-classic-retro-video-games>> [Accessed 26 October 2020].
- Brownlee, J. (2013), *How Video Games Revived the Dying Art of Japanese Woodprinting*. [online] Fast Company. Available at: <<https://www.fastcompany.com/1673187/how-video-games-revived-the-dying-art-of-japanese-woodprinting>> [Accessed 29 October 2020].
- Bryant, J. (2012), 'Video Games'. In *Java 7 for Absolute Beginners*, Apress, pp. 221-247. https://doi.org/10.1007/978-1-4302-3687-0_12
- Calleja, G. (2015), 'Ludic identities and the magic circle'. In V. Frissen, S. Lammes, M. Lange, J. Mul and J. Raessens, (Eds.), *Playful Identities: The Ludification of Digital Media Cultures*. Amsterdam: Amsterdam University Press, pp. 211-224.
- Christians, G. (2018), *The Origins and Future of Gamification*. Ph.D. University of South Carolina.
- Dahya, N. (2012), Learning at Play. *Encyclopedia of the Sciences of Learning*, pp. 1811-1814. https://doi.org/10.1007/978-1-4419-1428-6_1734
- Della Lucia, M., Trunfio, M. & Go, F. (2016), 'Heritage and Urban Regeneration: Towards Creative Tourism'. In Bellini N., Pasquinelli C. (Eds.), *Tourism in the City* (pp.179-191). https://doi.org/10.1007/978-3-319-26877-4_12
- Drumwright, E. (2013), 'Games, Computer'. In Runehov A.L.C., Oviedo L. (Eds.), *Encyclopedia of Sciences and Religions*, Springer, Dordrecht (pp. 924-926). https://doi.org/10.1007/978-1-4020-8265-8_1221
- Egenfeldt-Nielsen, S., Smith, J. & Tosca, S. (2013), *Understanding Video Games* (2nd edition), Routledge.
- Ferguson, C. (2013), 'Video Games'. In *Advancing Responsible Adolescent Development*, (pp. 105-126), Springer, New York, NY. https://doi.org/10.1007/978-1-4614-6741-0_7
- Fiske, J. & Hartley, J. (1992), *I Glossa tis Tileorasis* [Reading Television], Athens: Aigokeros. ISBN: 9789603223924
- Frauenfelder, M. & Bates, R. (2019), 'The World of Raspberry Pi Retro Gaming'. In *Raspberry Pi Retro Gaming*, (pp. 1-23), Berkeley, CA: Apress. https://doi.org/10.1007/978-1-4842-5153-9_1
- Freeland, C. (2005), *Ma einai afto Texni?: Eisagogi sti Theoria tis Technis* [But is this Art?: An Introduction to Art Theory]. Athens: Plethron. ISBN: 9789603481416
- Gallese, V. (2020a), 'Brain, Body, Habit and the Performative Quality of Aesthetics'. In I. Testa & F. Caurana (Eds.), *Habits: Pragmatist Approaches from Cognitive Neuroscience to Social Science*, Cambridge: Cambridge University Press, 2021, in press. <https://doi.org/10.31234/osf.io/sge5m>
- Gallese, V. (2020b), 'The Aesthetic World in the Digital Era: A Call to Arms for Experimental Aesthetics', *Reti, saperi, linguaggi, Italian Journal of Cognitive Sciences*, 9(17), pp. 55-84. ISSN 1826-8889
- Georgiou, Th. (1989), *Se ti Chrisimevei i Aisthitiiki?* [What is Aesthetics for?], Athens: Smili. ISBN: 9607218078
- Grafton, A., Most, G. & Settis, S. (2013), *The Classical Tradition*. Cambridge, Mass: Belknap Press of Harvard University Press (p. 559).
- Guimarães da Costa, M. (2018), *Place, Memory and Ruin: For An Architecture that Preserves the Value of the Historicity of ohe Place*. [online] Urbanisticatre.uniroma3.it. Available at: <<http://www.urbanisticatre.uniroma3.it/dipsu/?portfolio=place-memory-and-ruin>> [Accessed 29 October 2020].
- Hepper, E., Ritchie, T., Sedikides, C. & Wildschut, T. (2012), 'Odyssey's end: Lay conceptions of nostalgia reflect its original homeric meaning', *Emotion*, 12(1), pp. 102-119. <https://doi.org/10.1037/a0025167>
- Hill, J. & Church Gibson, P. (2009), *Eisagogi stis Kinimatografikes Spoudes: Kritikes Prosenigisis* [Introduction to Film Studies: Critical Approaches], Athens: Pataki. ISBN: 9789601625140
- History.com. 2019. *Video Game History*. [online] Available at: <https://www.history.com/topics/inventions/history-of-video-games?fbclid=IwAR1GnZ7cZPdKFnknk7jLUGdWA-T_uorfa8jhe6CXhjG9V6ozupbeyJOepB8> [Accessed 25 October 2020].
- Hoven, E. van den, Sas, C. and Whittaker, S., 2012. Introduction to this Special Issue on Designing for Personal Memories: Past, Present, and Future. *HUMAN-COMPUTER INTERACTION*, 27, pp.1-12. <https://doi.org/10.1080/07370024.2012.673451>
- Huizinga, J. (1949), *Homo Ludens: A Study of the Play-Element in Culture*. (p. 34), London: Routledge & Kegan Paul Ltd. ISBN 0 7100 0578 4
- Kac, E. & Botelho, O. (1989), 'Holopoetry and Fractal Holopoetry: Digital Holography as an Art Medium', *Leonardo*, 22(3/4), p. 397. <https://doi.org/doi:10.2307/1575403>

- Kelly, J. (2009), 'Gaming'. In *Don't Spend a Dime* (pp. 227-242), Apress. https://doi.org/10.1007/978-1-4302-1864-7_12
- Kirkpatrick, G. (2011), *Aesthetic Theory And The Video Game*, New York: Manchester University Press. ISBN: 9780719077180
- Kress, G. & van Leeuwen, T. (2010), *I Anagnosi ton Eikonon: I Grammatiki tou Optikou Schediasmou* [Reading Images: The Grammar of Visual Design], Athens: Epikentro. ISBN: 9789604582662
- Lyons, S. (2018), 'Introduction: Ruin Porn, Capitalism, and the Anthropocene'. In Lyons S. (Eds.) *Ruin Porn and the Obsession with Decay*, (pp. 1-10), Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-93390-0_1
- Makai, P. (2018), 'Video Games as Objects and Vehicles of Nostalgia', *Humanities*, 7(4), p. 123. <https://doi.org/10.3390/h7040123>
- Matheu, N. (2005), *Life Cycle Document Management System for Construction*. Ph.D. Polytechnic University of Catalonia.
- Matk.gr. n.d. Charaktiki - Mouseio Asiatikis Technis Kerkyras [Engraving (ukiyo-e) - Museum of Asian Art of Corfu]. [online] Available at: <<http://www.matk.gr/gr/sylogos/sylogi-iaponikis-tehnis/thematikes-enotites/haraktiki/haraktiki/>> [Accessed 26 October 2020].
- Naik, P. (2016), 'Importance of Artificial Intelligence with their wider application and Technologies in Present Trends', *International Journal of Scientific Research in Computer Science, Engineering and Information Technology*, 1(3), pp. 57-65. <http://ijsrceit.com/CSEIT161310>
- Niedenthal, S. (2008), *Complicated Shadows: The Aesthetic Significance of Simulated Illumination in Digital Games*. Ph.D. Malmö University.
- O'Regan, G. (2018), 'Atari Video Games'. In *The Innovation in Computing Companion* (pp. 39-43), Springer, Cham. https://doi.org/10.1007/978-3-030-02619-6_9
- Parisaki, Th. (2004), *Filosofia kai Techni: Apo tin Antikeimenikotita tou Oraiou stin Ypokeimenikotita tou Goustou* [Philosophy and Art: From the Objectivity of the Beautiful to the Subjectivity of Taste], Thessaloniki: Zitros. ISBN: 9608437059
- Pearson, L. (2020), 'A machine for playing in: Exploring the videogame as a medium for architectural design', *Design Studies*, 66, pp. 114-143. <https://doi.org/10.1016/j.destud.2019.11.005>
- Pétursdóttir, Þ. & Olsen, B. (2014), 'Modern Ruins: Remembrance, Resistance, and Ruin Value'. In Smith C. (Eds.), *Encyclopedia of Global Archaeology* (pp. 1-13), Springer, New York, NY. https://doi.org/10.1007/978-1-4419-0465-2_1055
- Piette, M. (2019), 'Review of *Being with the dead* by Hans ruin, Stanford University press, 2018', *Phenomenology and the Cognitive Sciences*, 19(3), pp. 589-595. <https://doi.org/10.1007/s11097-019-09646-1>
- Rodini, E. n.d. *Art Museums And (Art) Objects (Article) | Khan Academy*. [online] Khan Academy. Available at: <<https://www.khanacademy.org/humanities/approaches-to-art-history/tools-for-understanding-museums/museums-in-history/a/art-museums-and-art-objects>> [Accessed 25 October 2020].
- Schiavone, F. (2013), 'Vintage Innovation by Users'. In *Communities of Practice and Vintage Innovation* (pp. 89-106), SpringerBriefs in Business, Springer, Cham. https://doi.org/10.1007/978-3-319-01902-4_5
- Sebald, G. (2018), 'Digital Social Memories'. In *Knowledge, Nescience and the (New) Media" 4th Conference of The International Alfred Schutz Circle for Phenomenology and Interpretive Sociology*.
- Sherrill, S. (2020), *Are Video Game Consoles Works of Art? A Look at the Design Philosophy of Game Consoles*. [online] Levelskip.com. Available at: <<https://levelskip.com/consoles/Are-Video-Game-Consoles-Works-of-Art>> [Accessed 24 October 2020].
- Su, Y. (2018), 'The application of 3D technology in video games', *Journal of Physics: Conf. Ser.* 1087 062024, pp. 1-5. <https://doi.org/10.1088/1742-6596/1087/6/062024>
- Sumpter, S. (2004), 'Katsushika Hokusai's Ghost of Kohada Koheiji: Image from a Fallen Era'. In *Prized Writing* (pp. 60-70) California: University of California at Davis.
- Suominen, J. (2012), 'Mario's legacy and Sonic's heritage: Replays and refunds of console gaming history', In *Nordic DiGRA*, pp. 1-18.
- Takala, T., Hämäläinen, P., Matveinen, M., Simonen, T. & Takatalo, J. (2015), 'Enhancing Spatial Perception and User Experience in Video Games with Volumetric Shadows'. In Wyeld T., Calder P., Shen H. (Eds.) *Computer-Human Interaction. Cognitive Effects of Spatial Interaction, Learning, and Ability*. OzCHI 2013. Lecture Notes in Computer Science, vol 8433 (pp. 91-113), Springer, Cham. https://doi.org/10.1007/978-3-319-16940-8_5
- Tanovic, S. (2015), *Memory in Architecture: Contemporary Memorial Projects and their Predecessors*. Ph.D. Delft University of Technology.
- Video Games. (2012) In Seel N.M. (Eds) *Encyclopedia of the Sciences of Learning* (pp. 3401-3401), Boston, MA: Springer. https://doi.org/10.1007/978-1-4419-1428-6_2481
- Waller, M. (1997), 'If "Reality Is the Best Metaphor," It Must Be Virtual'. *Diacritics*, 27(3), pp. 90-104. <https://doi.org/10.1353/dia.1997.0026>
- Williams, J. & Smith, J. (2007), *The Players' Realm: Studies on the Culture of Video Games and Gaming*, Jefferson, N.C.: McFarland & Co., pp. 120-121.
- Whitehouse, T. (2018), 'Fascination with Ruins'. In *How Ruins Acquire Aesthetic Value* (pp. 11-19), Palgrave Pivot, Cham. https://doi.org/10.1007/978-3-030-03065-0_2
- Wolf, S. (2000), 'Spintronics, Electronics for the Next Millenium?', *Journal of Superconductivity: Incorporating Novel Magnetism*, 13(2), pp. 195-199. <https://doi.org/10.1023/A:1007764131406>
- Wulf, T., Bowman, N., Rieger, D., Velez, J. & Breuer, J. (2018), 'Running Head: Video Game Nostalgia and Retro Gaming', *Media and Communication*, 6(2), pp. 60-68. <https://doi.org/10.17645/mac.v6i2.1317>
- Wulf, T., Bowman, N., Velez, J. and Breuer, J. (2020), 'Once upon a game: Exploring video game nostalgia and its impact on well-being', *Psychology of Popular Media*, 9(1), pp.83-95. <https://doi.org/10.1037/ppm0000208>
- Zettl, H. (1999), *Efarmosmeni Aisthitiiki stin Tileorasi kai ton Kinimatografo: Eikona, Ichos, Kinisi* [Sight Sound Motion: Applied Media Aesthetics], Athens: Ellin. ISBN: 9789602862773



ROSSETOS METZITAKOS

is Assistant Professor in University Of West Attica in Athens. He is a graduate of the Department of Graphic Design 1996 of Technological Institute of Athens. He gained his Master of Arts in Visual Communication in B.I.A.D Birmingham Institute of Art and Design in England 1998, and was awarded a PhD title in Research Design B.I.A.D. 2006. He worked as research Associate in the department of Graphic Design since 2001 and appointed to the same department in 2009 as Assistant Professor in Multimedia Graphic Design.

He is the Director of Graphic Design sector in the Graphic and Visual Communication department over the last 5 consecutive years, and supervised more than 50 graduates to date. He is a principal founding member of the Research, Design, Interior Architecture and Audiovisual Research Laboratory of the School of Applied Arts and Culture, as well as the Postgraduate Program (MA) in Intelligent Packaging: New Marketing and Technology 2018. He is supervising (2) doctoral candidates and at least (6) as secondary supervisor. He is in charge and the creator of the Multimedia Graphic Design Lab (2006) in the Graphic Design and Visual Communication department. He has participated in scientific conferences as a speaker and has published papers in conference proceedings. Specializing in web design and smart devices applications UI/UX design.

rossetosm@uniwa.gr



DIMITRIOS PANAGIOTAKOPOULOS

(born in 1993) received his Integrated Master in Audiovisual Science & Art from the Dept. of Audio & Visual Arts of the Ionian University in 2017. During his studies, he has participated as an exchange student at Cardiff Metropolitan University (MFA). In 2020 he obtained his MSc entitled "Intelligent Packaging; New Technologies and Marketing" from the Dept. of Graphic Design and Visual Communication of the University of West Attica. Since 2019 he is a Ph.D. Candidate in the same department. His current research interests focused on interactive, adaptive, and multisensory methods and technologies in the broader context of smart tourism-culture. He has research and professional working experience in Bologna and Milan, Italy.

dpanagiotakopoulos@uniwa.gr



MARINA CHRISTODOULOU

(born in 1994) received her degree from the Dept. of Theatrical Studies of the University of Patras, with a general specialization in the systematic analytical study of the history and theory of theater (ancient and modern), literature, film industry, visual arts, and music. Currently, Marina is pursuing a master's degree, entitled "Digital Humanities and Digital Knowledge" at the University of Bologna. Her research interests are focused on Human-Computer Interaction, Cultural informatics, Web semantics, and multisensory marketing.

marina.christodoulou@studio.unibo.it