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CULTURAL HERITAGE—ITS DIGITAL PRESERVATIONS, AND COLLATERAL DAMAGE

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CULTURAL HERITAGE—ITS DIGITAL PRESERVATIONS, AND COLLATERAL DAMAGE

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the School of Graduate Studies of Kadir Has University
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APPROVAL

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DECLARATION ON RESEARCH ETHICS AND PUBLISHING METHODS

I, BARAN KAHRAMAN; hereby declare

- that this Master of Arts that I have submitted is entirely my own work and I have cited and referenced all material and results that are not my own in accordance with the rules;

- that this Master of Arts does not contain any material from any research submitted or accepted to obtain a degree or diploma at another educational institution;

- and that I commit and undertake to follow the "Kadir Has University Academic Codes of Conduct" prepared in accordance with the "Higher Education Council Codes of Conduct".

In addition, I acknowledge that any claim of irregularity that may arise in relation to this work will result in a disciplinary action in accordance with the university legislation.

BARAN KAHRAMAN

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23.12.2022

to my mother,

ACKNOWLEDGEMENT

CULTURAL HERITAGE—ITS DIGITAL PRESERVATIONS, AND COLLATERAL DAMAGE

ABSTRACT

The fundamental goal of this thesis is to examine the relationship between cultural heritage and 3D visualizations of them, stretching and challenging the definition of simulacra in order to better understand what role the concept of digital preservation plays in contemporary cultural heritage preservation practices. At the basis of my argument is the allegation that digitalization of cultural heritage preservation shares with virtual reality a new mode of production, a rhetorical position employed to specific, cultural, and symbolical ends. The purpose of this connection is two-fold: first, I examine 3D visualization in cultural heritage preservation apart from CGI or CAD, which only mimics the computational creation; this position investigates and questions how capturing reality in 3D within all dimensions (only appearances) brings a new dissolution of heritage that we can put any material object or site in any scale into Virtual Reality or reproduce it up to 3mm accurate representation. Second, I make a conceptual analogy of the Baudrillardian perspective of digital imagery to criticize the virtual solutions to preserve cultural heritages. I also describe that those solutions might open more expansive windows to a new visual culture, a new production pipeline within the Deleuzian perspective. Situating the digital blueprints of cultural heritage under the banners of their most repeated utilities and functions (immersion, dissemination of knowledge, human-computer interaction), the thesis uses case studies to illuminate and illustrate the digitalization of preservation in which digital reproduction technologies have virtually constitute the shape of the cultural heritage in the last couple of years. It also creates a creative visual study to provide the necessary demonstration of theoretical argument and the digitalization process itself in order to express the new territorial practices of cultural heritage under the transmission to the digital infrastructures.

Keywords: 3D visualization, digital preservation, simulacra, hyperreality, deterritorialization, digital heritage, digitalization of the cultural heritage

KÜLTÜREL MİRAS—DİJİTAL KORUMALARI VE İSTENMEYEN HASAR

ÖZET

Bu tezin temel amacı, dijital koruma konseptinin çağdaş kültürel mirası koruma uygulamalarında oynadığı rolü daha iyi anlamak için simülakr tanımını genişleterek ve sorgulayarak kültürel mirası ve 3 boyutlu görselleştirmelerinin arasındaki ilişkiyi incelemektir. Tartışmanın temelinde, kültürel mirasın korunmasının dijitalleşmesinin sanal gerçeklikle yeni bir üretim tarzını, belirli kültürel ve sembolik sonuçlar için kullanılan retorik bir konumunu paylaştığı iddiası var. Bu bağlantının amacı iki yönlüdür: Birincisi, kültürel mirasın korunmasında yalnızca hesaplamalı yaratımı taklit eden CGI ya da CAD'dan ayrı olarak 3D görselleştirmeyi inceliyorum; bu pozisyon, gerçekliği tüm boyutlarda (yalnızca görüntüleriyle) 3 boyutlu olarak yakalamanın, herhangi bir maddi nesneyi ya da herhangi bir ölçekteki alanı Sanal Gerçekliğe koyabileceğimiz veya 3 mm'ye kadar doğru temsile kadar yeniden üretebileceğimiz mirasın yeni bir çözülmesini nasıl getirdiğini araştırır ve sorgular. İkinci olarak, kültürel mirasları koruma yönelik sanal çözümleri eleştirmek için Baudrillard'ın dijital imgeleme perspektifine kavramsal bir benzetme kuruyor. Ayrıca bu çözümlerin yeni bir görsel kültüre, Deleuze'ün perspektif içinde yeni bir üretim hattına daha geniş pencereler açabileceğini de tarif ediyorum. Kültürel mirasın dijital planlarını en çok tekrarlanan yararları ve işlevleri (içine gömülme, bilginin dağılımı, insan-bilgisayar etkileşimi) başlıkları altında konumlandırılan bu çalışma, dijital yeniden üretim teknolojilerinin içinde korumanın dijitalleşmesini aydınlatmak ve göstermek için son birkaç yılda giderek artan örnek vaka çalışmalarını kullanır. Ayrıca, kültürel mirasın dijital altyapılara aktarımı kapsamındaki yeni bölgesel pratikleri ifade etmek için gerekli teorik argümanı ve dijitalleşme sürecinin kendisini göstermek için yaratıcı bir görsel çalışma oluşturur.

Anahtar Sözcükler: 3D görselleştirme, dijital koruma, simülakr, hiper gerçeklik, yersiz-yurtsuzlaştırma, dijital miras, kültürel mirasın dijitalleştirilmesi

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1. INTRODUCTION

In the early years of 2019, Paris' best-known cultural heritage, Notre Dame Cathedral, was partly destroyed by fire, paradoxically in a reconstruction work, that described the importance of preserving particular archeological, cultural, and geospatial entities that, so to speak, narrate World Heritage. While the destruction of the Temple of Bel (Syria) also has shown how reality, in principle, is fragile, there are at the moment 52 World Heritage in danger listed by the United Nations Educational, Scientific, and Cultural Organization (UNESCO 2022), which conducts many questions on what the current state-of-art documenting, preserving, and carrying to the next generations such cultural artifacts, architecture, and sites, technically speaking, tangible heritage. Given that, it is not even a surprise that many disciplines, private companies, museums, Non-Governmental Organizations (NGOs), and individuals have worked together or apart to archive while benefitting digital reproduction technologies in terms of bringing aid to potential extinction before any human causes, natural disasters, global conflicts, or lack of interest. For instance, when the Bamiyan Buddhas were demolished by the Taliban, in 2003, a digital preservation company, CyArk (cyber archive), has founded to provide necessary archival attention and technical expertise to utilize imaging technologies in order to preserve World Heritage, while called its mission is to "digitally record, archive and share the world's most significant cultural heritage and ensure that these places continue to inspire wonder and curiosity for decades to come" (cyark.org 2020). However, it was only in 2011, CyArk put a public face on with three-dimensional visualization (3D reconstruction) of Palmyra's ruins, that is lost under attack by Islamic State (ISIS), a global conflict yet a local destruction. As a result, 3D digital archiving practice undeniably became the most accurate representation of the Temple of Bel, at least its ruins after the attack, 3D visualization technologies enabled more interest in the preservation of cultural heritage in a digitalization of cultural heritage within the networks of digital reproduction technologies. As such, 3D visualization techniques recently become a lauded solution emphasized by various approaches, academics, and research fields as it captures shapes and appearances of the objects unlike other conventional documenting processes such as photography or video even it depends on

their standardized systems and digital protocols. The crowd-sourced 3D digital models of Notre Dame support this claim by various news online which mainly declares that digital technologies is helping to preserve our common heritage for the future generations.

Digital preservation has two profound meanings; one is described by UNESCO as "consist of the processes aimed at ensuring the continued accessibility of digital materials" (UNESCO 2019), and the other, in this thesis, will illustrate the documentation of cultural heritage within digitalized network systems that will be described as digitalization of preservation. In this approach, converting cultural properties into digital models (ply, obj, fbx) depends on information and communication technologies in all steps. However, finding a universal voice of the 3D visualization between digital preservation and reproduction is quite challenging while there are only a few investigations in communication studies to detect the roles of such technologies. For that reason, this thesis attempts to move beyond many grounded articulations of the image, sign, simulacra, simulation, and hyperreality in relation to our mode of production that mediate ambivalence between human-computer interaction and digital infrastructures. For this reason, this thesis initially asks what will protect the reality of the cultural properties from its captivation by digital preservation practices.

As technological inventions eventually become the prosthetics of politics, social production of meanings, and individuals; they set growth to new features, symbolical regenerations, mediated point-of-views, and immersive experiences. Whereas since the Renaissance era, the re-presentation of space fulfills a long-held ambition of display technologies, digitalization of cultural heritages exhibited by Notre Dame and Temple of Bel highlights the contemporary visualization mechanism that is capturing spatial properties not just for a documentation practice but also underlines itself for a new contextualization, mediazation, and interaction throughout a radical shift in visual culture. In this sense, while most of the funding, research, publications, and applications for 3D visualization have come from the disciplines of computer science, remote sensing, and cognitive sciences, there is an urgent need for the involvement of communication studies and new media studies. This thesis describes how digital copies, technical

processes, and intellectual knowledge behind the digitalization of cultural heritage creates new problematics rather than just their technical developments and advancement but also in the system of signs distributed according to the digitalization of the concept of preservation itself.

As such, this thesis is an attempt to identify the digitalization of cultural heritages and map out a critical understanding of virtual solutions provided by the 3D visualization practices that radically fetishize cultural heritage within a miniaturization and reterritorialization (Deleuze and Guattari 1987) in the body of technical devices and digital infrastructures. While doing this, it raises questions on how cultural properties are becoming mere images within digital reproduction technologies to provide a warning to the concept of digital preservation. By describing the spatialization of the digitalization of cultural heritage, the thesis aims to put forward that if the current trajectory continues, a new certain danger will arise, simply the danger of digital preservation itself in which it might not be available to interpret in the future. This position enacts the problematic of digital objects that cannot be unavailable to use, engage, or practice without any mediation and other interrelated problems such as alienation of heritage, misuse, manipulation, authority, ownership, and so on. In this sense, the thesis contributes to the body of literature on the digital preservation of cultural heritage and communication studies to describe emerging visualization mechanisms and their uncanny nature by demonstrating the transition from digitizing images to the digitalization of spatial.

The guiding question of the thesis is: *How does the digitalization of cultural heritage function as a preservation program?* Addressing this question under the problematic of preservation-conservation of cultural heritage entails looking at several other supporting questions. For instance, how do 3D visuals of the physical instance produce a virtual materiality as a disembodied image? What features of cultural heritage do digital reproduction technologies renounce and protect? Who or what will protect heritage's spatio-temporal reality from the digital archiving program that diffuses only its appearances? As a result of the actual-virtual entanglement a question of how documentation of cultural heritage is produced within the migration of values also emerges. Following this line of inquiry will lead to an understanding of the technical

processes in which they are creating digital replicas as well as an articulation of theoretical engagement, such as the new undead mode of heritage in digital infrastructures.

Because of its multidisciplinary character, the subject of this study draws on a variety of linked bodies of literature and technical research. Key overlapping concepts of simulacra, simulation (Virilio 1994; Baudrillard 1994), and deterritorialization (Deleuze and Guattari 1987) give rise to the theoretical framework employed in this study. The service of combining perspectives of those critical thinkers' conceptualizations on reproduction and techniques of the observer relies on how one direct me to describe the digitalization of cultural heritage as a *hyperreal heritage*, and the other one helps redefine the transition from the preservation of cultural heritage to a digital conservation. While their overlapping and complimentary nature has been discussed and translated into different directions by various research fields such as philosophy, theory of the image, phenomenology, or social theory, I aim to offer an interrelated conceptualization with these lines of inquiries that will describe the contingent, mutating, and emergent mode of "captivation" as a catastrophic state of perception and appreciation of digital—virtual cultural heritage.

Why do we need to protect our material past? Why do we exactly need to digitally be archiving of our cultural heritage? Do we actually preserve their existence, or do we virtually eliminate their actual instance through a simulation of preservation? These are several other questions when I started to work on this study. To answer such questions, I intended to create a visual practice that also questions the processes themselves from the recent technologies in order to show their falseness, errors, and pure self-referential territories rather than their perfectness and goodness, which is already provided by many investigations. The visual study uses free-of-use software and mobile devices and applications, which will bring conclusion that how 3D visualization can, in fact, be a new kind of danger to common heritage but also, they might open wider avenues through spatiality itself.

In this sense, the originality of the thesis lies in its examination of the practice within a theoretically oriented empirical study. By echoing Gillian Rose's *Visual Methodologies*, the methodological framework employed in this study is based on thinking about visual materials, pioneers of technology, and their digital conditions in terms of three planes: the plane of reproduction, which is where an image of cultural property is created, the plane of the image itself which its visual content across various mediums, and the plane itself where production of image encounters repetition, circulation, and omnipresence (2016, 4th Edition:16). In each chapter, a structure blends both scientific voices, case studies, and theoretical examination have been established. This approach is more achievable in that it helps the complex nature of the subject to different disciplines, research methods, and perspectives.

This study is divided into three individual chapters, which proceed from the construction of digital preservation of cultural heritage to the deconstruction of their settled apprehension as criticism and to the reconstruction of a new argument in order to put subject to a different plane rather than just executing their conceptual and technical progression. To explore and illustrate the transition of preservation to digital conservation under the 3D visualization mechanism and its relationship to reality, cultural symbols, and symbolism of virtual culture and media that diffuse an understanding of shared existence, the thesis begins with a construction of the subject around various materials. The second chapter, entitled as *construction* will be presenting the technical and methodological developments and current trajectory of digital preservation. Additional illustrations are given along the thesis while assuring that the digitalization process neither serves a preservation program but also paved the way for many related technological processes. By referencing productions of this emergence, the chapter attempts to draw a map of the current state of the digitalization of cultural artifacts to show how the conservation of heritage in digitalized networks radically shifts the preservation coin between digital reproduction technologies and archival practices. In order to solidify this historical and technological structure, the chapter eventually describes the roles and definitions of digital preservation concept through the studies from the last twenty-years. This set the ground for the thesis to examine further what

features of this technological achievement provides to institutions, museums, private companies, and individuals in terms of translating recent possibilities of 3D visualization.

Based on the given framework that provides the relevant intellectual and technical rigor, the third chapter entitled as *deconstruction* bring the argument that our new imaging capability is initiating a new visual culture with the legitimization of the 3D reproductions of cultural heritage, which is now moving towards the digitalization of spatial rather than the digitization of the image. By the denial that it brings aid to any extinction, destruction, or danger, this chapter describes a new novel mode of danger: the fatality of virtual reality. The digitalization of cultural heritage is examined with Baudrillard and Paul Virilio's viewpoint on virtual reality and hyperreality in which the conversion into the 3D digital models and viewport are elaborated as the new simulacrum of cultural heritage. This enacts the position of critical stance against digitalization in which cultural properties today can release their historical and symbolical value but eventually researches new epistemes. By putting Baudrillard's simulation theory (1994) into focus, this chapter eventually put forward a phase of transmission in history through actual preservation to digital conservation, which is similar, albeit a limited, version of the simulation itself in the digital infrastructures within a denial of the lost object. By referencing Baudrillard's precessions of simulacra at the end of this chapter, the visual study discusses the fragility or the danger of digital preservation and the projection of its transformation into an image with referent to no meaning whatsoever.

The fourth chapter, entitled as *reconstruction* puts all arguments into a different plane, to the plane itself, in order to redefine the digitalization of cultural heritage in between Baudrillard's and Deleuze's distinction in the understanding of simulacrum. What triggers this argument is the feature of the 3D visualization where cultural artifacts re-present themselves in Cartesian space (x, y, z) without any fixed viewpoint that we cannot achieve with our naked eyes. Perhaps, this is the most virtual real that all development of 3D technologies relies on, where we can see things from every angle, but eventually there is always a mediator which we cannot escape or fully immerse without it. Throughout this chapter, the 3D visualization is considered as it is creating simulacrum of the heritage.

2. CONSTRUCTION

As Thiago Minete Cardozo and Costas Papadopoulos discussed in their article *Heritage Artefacts in the COVID-19 Era: The Aura and Authenticity of 3D Models* (2021), the COVID-19 pandemic allowed many institutions to utilize prior investments in digitalization such as 360-degree tours, virtual museums, virtual exhibitions, and online publications (digital exhibitions) while increasing their out-reach on social media platforms (Google Arts & Culture), according to UNESCO's report on "Museum Around the World in the Face of COVID-19" (2020, 15–16). The International Council of Museums' report on "Museums, Museum Professionals, and COVID-19" (ICOM 2020) confirms that after the lockdown, museums' digital services increased, almost by 50% for social media and between 10% and 19% for online collections and exhibitions, podcast, newsletter, podcasts, quizzes contents, and live events (2020, 10). Additionally, the Network of European Museum Organization (NEMO 2020) calls for increased investment in digital heritage, including both engaging virtual experiences and digital engagement, recognizing that they "bring people together, encouraging creativity, sharing experiences, and offering a virtual space to build ideas collectively" in their report on the "Survey on the impact of the COVID-19 Situation on Museums in Europe" (2020, 3). In order to update the 2011 Recommendation (EUR-Lex - European Union Law) on the digitization and online accessibility of cultural material and digital preservation, the European Commission also announced in June 2020 the opening of a public consultation on digital access to European cultural heritage. It is important to note that the 2011 Recommendation did not include a reference to 3D digitalization. It is, in this sense, evident that priorities have changed to more technologically advanced and interesting digital solutions ten years after the last guideline and considering recent instances of cultural loss and inaccessibility. Similar recent initiatives by the European Commission, such as the "Basic Principles and Tips for 3D Digitization" (The Expert Group on Digital Cultural Heritage and Europeana 2020) report and the "Study on the Quality in 3D Digitization of Tangible Cultural Heritage" (Cyprus Institue of Technology 2022), which was launched in September 2020, also seek to address the growing demand for the 3D digitalization of cultural heritage. These are only a few reports that Cardozo and Papadopoulos find out on the digitization/digitalization process, which posit salvation

and a new kind of governmentality in between binary conjecture (0/1) and technical processes of information and communication technologies (ICTs). Within this context, this chapter aims to construct the 3D visualization (digitization-digitalization) of tangible culture heritage by engaging with various projects and projections.

Physical artifacts or sites converted into 3D digital objects provide new avenues for interaction, such as digital modification and participation in limitless contextualization across various mediums. As the variety of techniques for 3D visualization now available to create digital models of artifacts includes laser scanning and photogrammetry, the software also initially developed for other disciplines has been co-opted to interpret the products of those scanning endeavors (Garstki 2017). As a result, this approach has led to a more interactive artifact experience that gives researchers and the general public online access to archaeological collections. Apart from institutions for cultural heritage preservation, there are, at the moment, many museums who process—digitizing their material collections in order to take more interest in their awareness. In this sense, digital artifact representation (3D reconstruction) will be as crucial to archaeology as conventional photography if the current trajectory continues. Given that photography and representational media, in general, continue to have a contentious place in the creation of archaeological knowledge, it is vital to confront these same challenges with the growing use of 3D visualization in heritage preservation. Therefore, it is necessary to illustrate the issue as both an opportunity and a danger. This chapter ultimately attempts to illuminate how 3D digital copies of heritage are understood by various institutions and practices. By doing this, it tries to construct the current role of information and communication technologies in the practice of 3D visualization and transferring heritage digitally to future generations. For these reasons, it would be appropriate to first explain the concerns and responses against the erasure of the cultural heritage and then the mediatization by the technique of 3D visualization and eventually its emergence around the concept of digital preservation.

The Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention) was enacted in 1972 and entered into force in 1975. As Lynn Meskell and Claudia Liuzza argued recently (2022), The Convention established a

set of commitments, specifically signatory states' duty to designate sites and their responsibility in conserving them. By signing the World Heritage Convention, each nation agreed not only to safeguard World Heritage sites inside its boundaries but also to protect its national heritage in general. Ideally, the devotion would be worldwide, as seen by the early international rescue operations. UNESCO urged the international community to work together to save endangered monuments such as Abu Simbel, raising funding and collaborating to strengthen international solidarity. As a result, the Convention's institutional architecture was initially designed to unify international activities and financial pledges, creating a trust fund for the world's common treasures. Certainly, the Convention has raised public awareness of the numerous dangers to cultural and natural sites across the world. However, foreign financing for UNESCO's worldwide preservation initiatives has been substantially cut and is now being redirected among the expanding number of other bodies seeking to capitalize on World Heritage's appeal. The most serious financial problem for UNESCO happened in 2011 when the United States stopped paying its dues (Hüfner 2017). Other donations have not made up for the significant gap. Some countries have directed their subsequent contributions to UNESCO's Funds-in-Trust, while many others have created their own independent programs outside of UNESCO's purview. While such projects increase and frequently duplicate preservationist efforts throughout the world, they also signal that UNESCO's responsibility to consolidate and regulate global property is weakening.

Growing issues within the World Heritage program over the past several decades have led to acquisitive inscription methods that add more and more sites to the World Heritage List with less consideration for the preservation of those that are already inscribed. A hybrid heritage environment has arisen over the past two decades as a result of new global problems and the emergence of new stakeholders. Apart from consensus on the impact of COVID-19 on the heritage given above, museums, and their collections; the elision of non-state participation generally has precipitated the rise of alternative agencies, non-governmental organizations (NGOs), civil society, and corporate initiatives. As such, the globe has undergone a significant transformation in the fifty years since the World Heritage Convention was established, and new alliances and spatialities are redefining international institutions. Thus, rather than open a discussion about the top player for the

preservation of heritage (UNESCO) and its work model for heritage conservation, it is timely to consider what emerges from the novel modes of communication technologies that exhibit a new kind of paradigm shift in preserving World Heritage and other collective treasures for the future generations. These new global challenges and the rise of new players in an instrumentation of heritage across digital mobilization raises many opportunities in scientific research, education, and recognition, but also more broad concerns about the future of the World Heritage or any cultural relics in the digitalization practices. In the light of this manner, I follow these new directions and examine together their effects and production of global social movements through the digitization of heritage in the next paragraphs.

UNESCO and other governmental organizations quickly adopted such agencies to focus on the emerging technical possibilities and rhetorical conservation through World Heritage. It is, then, also necessary to take this articulation as a two-folded process of globalization of the heritage sphere where all actors play fundamental roles between the construction of the creative captivation (3D visualization) and the span of several algorithmic productions (3D digitalization within various research fields). My intention here is not to imply that UNESCO is obsolete, but rather that many other projects are actively attempting to duplicate, improve upon, or fundamentally re-envision the task once claimed by the World Heritage program (Meskell and Liuzza 2022). For example, there are established organizations founded in the 2000s and afterward, owing to the innovations in imaging and computer graphics technologies, but as a response to the heightened destruction of cultural properties such as the Bamiyan Buddhas and Islamic State attacks on Syrian heritage. Global Digital Heritage, Preservica, CyArk, International Dunhuang Project (IDP), Digital Heritage Research Lab (DHRLab), Our World Heritage, Endangered Archeology, or the Association for the Protection of Afghan Archeology are only a few organizations to protect cultural heritage while using emerging technical possibilities that clearly shows how digital technologies are becoming a valid tool for in conventional protection, rehabilitation, or reconstruction. As this transformation is a response to the erasure of the heritage, Ben Kacyra, co-founder of the CyArk, says, cultural heritage properties are rapidly disappearing while we trying to be

preserving (2011). In this sense, it is a time-relational matter that such initiatives are rowing against a strong tide.

As Gabriele Guidi and Bernard D. Frischer argues (2020) any scholar in the Humanities and Social Sciences, such as Archaeology, Art History, or Architectural History, generally begins by cataloging the surviving evidence of tangible heritage. Photography has been the standard method for rapid and efficient documentation since the eighteenth century, and it is still useful for displaying two-dimensional things like paintings or aerial views of archaeological sites. A photograph of a cultural item, however, is typically insufficient for the purpose of complete recording when it has more geometrical complexity, such as, for example, a statue in the round. A scale may also be used to depict an item in a photograph in metric units, although this method only produces approximations rather than the submillimeter accuracy that can be attained by a digital model created using 3D digitalization (visualization) technology. This lack of precision may cause a loss of information and a subsequent misunderstanding, depending on the field. A cultural artifact may be examined through its 3D digital model in ways that are not even conceivable with the real physical thing, such as navigating, sectioning, seeing through, measuring, and comparing the heritage artifact. This enables academics from all over the world to do in-depth research on historical sites that are even extremely far from where they now reside, utilizing all the instruments at their disposal for an unbiased and quantitative examination. Thus, 3D visualization is ever increasing research field that is providing various tools for any integration through cultural heritage. This can be the main reason why UNESCO or other initiatives started to merge such technologies into the preservation of cultural heritage in order to bring new solutions dealing with the increasing lack of interest and rapid dissolution of cultural properties.

The "Study on quality in 3D digitization of tangible cultural heritage," (Cyprus Institue of Technology 2022) demonstrates that the digitization of cultural heritage is a successful attempt to classifying artifacts to preserve common heritage in the digital storages. As the DHRLab and Director of UNESCO Chair on Digital Cultural Heritage Marinos Ioannides emphasizes:

> "The digital recording of cultural heritage is an essential step in understanding and conserving the values of the memory of the past, creating an exact digital record for the future, providing a means to educate, skill, and communicating the knowledge and value of the tangible objects to the society" (2022).

The study illustrates that 3D digitization projects are directly related to the amount of funding and technical devices, but also intellectual knowledge who uses complex structures to create a final product, which is in itself scientifically challenging to obtain the "exact" documentation in such complicated network of digital and technical systems. For this reason, there have been various research running on in the last two year that technologies adopted and developed by many purposes and methodologies. For instance, NVDIA, the global leader in graphics processing units (GPUs) and artificial intelligence hardware and software company (McGregor 2020), published its platform for conducting factory scale to planetary scale in order to create faster and higher fidelity to virtual replicas (digital twins) of unique objects, processes, and environments.[1] While this example comes from a high-tech company's commercialization of technological development, there have been many other specific illustrations. For example, Istanbul Fatih Municipality Cultural Heritage Conservation Directorate started to use the technical capabilities of 3D visualization in the same manner that other global initiatives work on already (Fatih Belediyesi 2021). From this point of view, the documentation of cultural properties in Cartesian coordinate system (x, y, z), resulting from corporates to philanthropic capitalism (e.g., Ben Kacyra), private-public partnerships, or social responsibility initiatives converted itself into a virtual gaze where heritage can be saved and locked in between technical devices and digital data storage. This enacts the question of who is responsible for the real accuracy of such visualization, even if it is well captured and processed. But it also brings the question of how the concept of digital preservation emerged through 3D visualization.

According to Guidi and Frischer (2020), the first work on 3D digitization of cultural artefacts was done in 1997 by the National Research Council Canada's Institute for

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[1] A virtual representation of a real-world physical system or product that acts as its indistinguishable digital counterpart for practical applications such as system simulation, integration, testing, monitoring, and maintenance.

Information Technology, which created and patented the first triangulation-based laser scanners (Taylor et al. 2003). There were a number of different objects. However, it was most likely the Stanford Digital Michelangelo Project which began in 1998, that first brought the new technique to the attention of specialists in the relevant departments of Humanities and Engineering. Including the well-known, 5-meter-tall statue of David, the team led by Marc Levoy scanned 20 Michelangelo sculptures in Italy (2000). The Digital Michelangelo Project also demonstrated to the public how much more educational the interactive 3D model might be when compared to the type of documentation previously employed, namely a still image. This was made possible by extensive news coverage of the project. In the same years, Cyrax (CyArk's innovation company), subsequently acquired by Leica Geosystems, introduced the first large-scale 3D laser scanners owing to research in the field of laser radar, where the radar techniques for measuring distances with electromagnetic waves are translated to the optical field. The original Cyrax 2400 was first designed as a tool for inspecting intricate industrial facilities (like NVDIA's latest products). It had a maximum range of 50 meters and could measure 800 points per second with a 6 mm error (Jacobs 2020). Soon after, it was used experimentally to build 3D surveys of cultural heritage sites. The Florentine Pietà, another early attempt, also involved a Michelangelo statue. The findings of a scan of the monument conducted by Fausto Bernardini and his group at the IBM Research Center were released in 2002. A 3D document was thought to be beneficial for this monument because of its intricate geometry since it would be able to capture details that other methods, including photography, would not be able to (Bernardini et al. 2002). In contrast to the Digital Michelangelo Project, a different method was employed in this project. The scanner was a non-contact active scanner, but instead of using laser triangulation, it took several photographs that were then combined into a 3D model using structured light and a stereo system. Once more, the outcomes were fairly successful, and the art historian saw advantages to working with both the original sculpture and a 3D visualization (2002, 9) Other pioneers can be listed as "The Great Buddha Project" (Ikeuchi et al. 2007), "Three-dimensional modelling of statues: the Minerva of Arezzo" (Fontana et al. 2002), "The Eternal Egypt Project" (Tolva and Martin 2004), "The Beauvais Cathedral Project" by Allen et al. (2003), *The Angkorian Temples Project* (Sonnemann et al. 2006).

Since then, significant advancements have been achieved in terms of faster data capture (at present, even mobile devices can capture spatiality in 3D, for instance iPhone 12 Pro), resolution, the inclusion of color overlaid on the geometric data, and the decrease of measurement uncertainty. One such project is the IU-Uffizi Project, which is based on the 1000 Roman sculptures that are preserved in the Uffizi Galleries and all the associated locations (Guidi et al. 2017). The Archeological Institution of Milan was the first museum to comprehensively digitize its collection as part of the 3DICONS European Project (2012-2015) (D'Andrea et al. 2012). The goal was to enhance EUROPEANA, the website (http://3dicons-project.eu/) devoted to European culture, using 3D representations of artifacts from the cultural heritage. All the collections related to the history of Europe, including artifacts from the Greek, Roman, Etruscan, late Egyptian, and medieval eras, were taken into consideration. Consequently, 427 museum-owned structures and artefacts were 3D modeled.

CyArk is one of the most popular initiatives among the other NGOs or corporate institutions that aimed to challenge to document of 500 World Heritage in their virtual collection (Haynes 2013). As such, these documents not only attempted to preserve cultural heritage in the digital realm but also their almost all detail within 3mm accurate representations (Figure 2.1) for any rehabilitation, reconstruction, exhibition, or scientific research. Their digital data, like the 3D representations from previous large-scale efforts, is highly beneficial for experts monitoring and managing slow architectural degradation at cultural properties. In this sense, the practice not only brings aid to destruction but also creates blueprints for reconstruction following catastrophic events, such as the current war in Ukraine (Tucker 2022). Based on this transformation through the possibility of digital—virtual archeological protection, the utilization of digitization and its complete development is under construction by enhancing experiences with 3D visualization. While also recently, North Karnataka beings the process of preserving over 400 monuments in 3D, according to Hindustan Times (Bengaluru News 2022), the studies in 3D visualization are to imply that the relationship between the potential or actual danger (caused by any global conflict or lack of interest) which documents digital cultural heritage is demonstrating tangible achievements.

Figure 2.1. CyArk's 3D Reconstruction of Recinto mausoleo - Huaca Cao Viejo (2021).

To give a more concrete example, the Factum Foundation collected some essays to show how 3D visualization technology can be used for the preservation of cultural heritage that accompanied their exhibition on 18 May 2020 – 15 February 2021 (Factum Foundation 2020). The exhibition and publication entitled "The Materiality of the Aura: New Technologies for Preservation" and divided into two chapters which one rethinks the functions of high-resolution recording, digital restoration, and creative re-materialization,

and the other one presents the cases that technology is used for. In this work, an article about the exploration of the original and the migration of the aura was penned by Bruno Latour and Adam Lowe. The article articulated the technology around the 3D reproduction of Paolo Veronese's vast painting *Les Noces De Cana* (1562-1563), which was put in its original space apart from its original, which is currently staying on the wall of the Louvre Museum. This particular study is the most advanced reproduction until today, which defines the concept of aura and digital preservation (or what they call digital facsimiles) in a new manner where 3D digitalization initiatives can be inspired and work more consciously through the implementation of digital technologies on actual preservation of the heritage. While there is no consensus about the emergence of 3D digitalization and its adaptation to the preservation of cultural heritage, these kinds of studies might enact a roadmap, rather than focusing on questions, debates, and technical problems, to how such technologies can be used in order to document, preserve, and exhibit the outstanding collections of cultural heritage. Given that, the "outstanding universal value" described by UNESCO can more broadly diffuse cultural heritage's existence to deliver more attention to their value but also vulnerability.

The distinctive flèche and a large portion of the roof of the Notre Dame Cathedral in Paris, which is a UNESCO World Heritage Building and possibly the most well-known historical site in France, were promptly destroyed by fire on April 15, 2019. The massive public uproar led to the raising of more than 1 billion dollars for the reconstruction in less than a week. Before the fire was fully extinguished, digital heritage projects and 3D-scan artists started posting photos of and laser scans of models of Notre Dame on social media, claiming that their 3D data would be useful in reassembling the gothic structure.[2] In addition, the destruction of the 12th century Gothic cathedral gave digital heritage organizations like CyArk and the Arc/k Project the chance to publicize their generally covert mission to digitally conserve architectural and material sites of historical properties around the world, which is also demonstrating the value of information and communication technologies of capture and display to make present again what in this case has been lost to history. The partial devastation of the cathedral indicates that, even

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[2] This is ironic because, according to reports, it was the reconstruction work that started the fire. See Sean Captain on this issue (2019).

though Notre-digital Dame's models unwillingly achieved their "documentary" character, the promise of such records resides in their rapid mobilization on behalf of proving the objective state of the referent.

Figure 2.2. Andrew Tallon's 3D reconstruction of the Notre Dame Cathedral.

However, Andrew Tallon had already implemented this practice four years before the fire. In this context, the system and documentation method he used to eliminate the destruction caused by the fire was glorified and revealed for use in the restoration of the church (Sandron and Tallon 2020). Afterward, BIM Community published an article (Rebuilding Notre Dame under a 3D BIM Model 2021) about the involvement of 3D software company Autodesk who also performed the same procedural study to obtain recent scans for comparison and reconstruction process (Figure 3).

Figure 2.3. Notre Dame Cathedral model from Autodesk (Autodesk Life n.d.).

Research into 3D imaging of artifacts from cultural heritage is still under progress. The approaches and studies described above are still in use, from early studies to recent developments, although during the past ten years they have gotten better in terms of quality, adaptability and speed of use. 3D imaging (visualization, reconstruction, or modeling) has many technical names but eventually refers to a representation of an object in Cartesian space is the process of capturing the shape and appearance either by photography or laser scanners and constructing their precise size in numerical applications. While it can be traceable through the photography's invention (photogrammetry is the method that combines multiple photos in different angle to achieve the 3D representation of a single object), the required technologies are developed in the last ten years. For instance, the best example can be Apple's approach that adds the technology to their mobile phones which creates 3D captures in just few minutes. Of course, scientific studies provide much more advanced technologies such as in the case of Latour and Lowe's study, yet today, such developments are coming to the end-users which put forwards clearly that non-governmental agents involve in the protection of the cultural heritage.

Within given context, echoing Gabriele Guidi and Bernard D. Frischer (2020), these be divided into as (1) interaction (e.g. head-mounted display, 3D view on flat screen), (2) remote visit (reasoning from dangers to visitors such as during wartime, fragility of object or environment, temporary closure owing to restoration work, inaccessibility of the location, (3) study and research (virtual archeology), digital restoration and reconstruction (pigment analysis, surface recognition), (4) heritage monitoring for conservation (degradation on a time scale that cannot evident to the naked eye), (5) physical replication (Les Noces De Cana), (6) 3D archives of cultural heritage (CyArk's virtual archive). This division can be understood as both a technical and methodological framework of 3D visualization through the 3D digitalization of cultural heritage. However, as regulations and guidelines are still lacking to cover the emergence there is still a need for more research on such transformation and potentiality which preserves cultural artifacts in technical and digital infrastructures.

Sketchfab is a 3D modeling platform website to publish, share, discover, buy, and sell those creations. While the company was founded in 2013, however in 2021, it was bought by Epic Games, which is another company for game development and 3D environment creation. While there are discussions on the preservation of cultural heritage within technical and methodological issues, this platform is the pioneer and most prominent network that has sought to overcome the web projection of such reproductions. Mobile applications such as Scaniverse, SiteScape, Polycam, and Scandypro also provide a wide variety of possibilities to scan (visualize) spatialities to create 3D digital models. These applications depend on Apple's algorithmic code published almost a year ago (Apple 2021). There is also some other software which includes more advanced visualizing methods and frameworks. For instance, Capturing Reality provides more detailed digital reconstructions to send digital data across other software. While such companies can be easily demonstrated in the entertainment sector, their functions, in fact, are developing and legitimizing the preservation of cultural heritage. For that reason, communication studies must take a role in this emergence.

As such, the field is developing around multidisciplinary research fields. From computer vision to archeology, both innovations in the increase of computational power have made

digital preservation an ongoing development, while many challenges still exist when building (digitally) an entire reconstruction pipeline. To clarify the context of the 3D digitalization of cultural heritage in the concept of digital preservation, this chapter maintained some of the most influential works which emerged from social sciences to engineering. At the end of this chapter, perhaps, it will be beneficial to conclude with an open definition of digital preservation. According to UNESCO's statement, "digital preservation can be seen as all those processes aimed at ensuring the continuity of digital heritage materials for as long as they are needed" (UNESCO 2019). While this definition stands on the site of digital materials (born-digital) and their continuity in the progression of technological development, my consideration throughout this chapter was the digitization process itself which physical-tangible cultural heritage was constructed within digital technologies. In this sense, digital preservation consists of not only the already documented objects but also those in the process of coming out with a virtual replica of themselves, within or without any scientific contributions. As said above that, any individual can become a participant in this transformation; thus, there are many issues with all those implementations of an evolving range of strategies to use the symbolical value of cultural heritage. In the end, while such documentation can be used to obtain their symbolic power and realistic appearances in video games, Augmented and Virtual Reality practices, or in the instrumentation of cultural heritage, this chapter tried to maintain the situation between the plane of reproduction and the plane of the image itself. In the next chapter, I place the reproduction into a root mode of production in between digital imaging and their infrastructures, in which it will present the plane of the image within critical understanding.

3. DECONSTRUCTION

"… the necessary deconstruction of artifactuality should never be allowed to turn into an alibi or an excuse. It must not create an inflation of the image, or be used to neutralize every danger by means of what might be called the trap of the trap, the delusion of delusion: a denial of events, by which everything - even violence and suffering, war and death - is said to be constructed and fictive, and constituted by and for the media, so that nothing really ever happens, only images, simulacra, and delusions" (Derrida and Ree 1994, 5).

"We now have the aesthetics of the disappearance of a numerical, unstable image of fleeting nature, whose persistence is exclusively retinal" (Virilio 1991, 36).

Michel Foucault's *The Order of Things: An Archeology of the Human Sciences* (2002) and Baudrillard's *Systems of Objects* (1996b) have fostered a materialist shift in philosophical inquiry. Now, what cultural objects are but what they do began to cast "an astonishing utopian vision that invites questions about the notion of the simulacra and the digital archiving of our planet" (MUBI's take in the Our Ark's page). *The Sky Is On Fire* (van der Auwera 2019) and *Our Ark* (Tortum and Hamilton 2021) have questioned this emergence with the digitalization of spatio-temporal reality through the practice and demonstration of 3D visualization mechanism. As Hugh McCabe reported (2019), the architectural historian Mario Carpo discussed the situation of modern imaging technologies and makes the case that we are transitioning from an image culture to a spatial culture (2017). Given that the image is more widely used than ever, this notion may seem counter-intuitive, but he is not suggesting that the image's cultural significance is waning or disappearing. He asserts that a new conceptual understanding of images is necessary in order to deal with the new imaging environment and that the processes for producing images are changing. The premise that contemporary imaging technologies have shifted from a concentration on the *digitization* of the image to the *digitalization* of space is what drives Carpo to identify this new spatial culture.

As Jonathan Crary has put forward in his book *The Techniques of the Observer* (1992), our imaging technologies and source of knowledge have derived from the camera obscura's philosophical adaptation to scientific inquiry and to optical gadgets where photography mimicked the same physics of the ancient dark room's same position. Early imaging techniques aimed to duplicate and advance earlier imaging techniques. In digital

photography, by swapping the film for a sensor for a sophisticated software to edit the resulting image, digital photography imitates analog photography. In both cases, though, the emerging point is that we take this to mean a two-dimensional representation of same part of a three-dimensional space. William J. Mitchell examined digital photography's main power as a physical signifier of the signified lied in verisimilitude or the indexical value in his book *The Reconfigured Eye: Visual Truth in the Post-Photographic Era* (1992). A different history in digital imaging technology begins with the notion of creating a representation of that three-dimensional space before utilizing software to produce imaging from that representation.

Similar to modern production schemas (second order of simulacra), for instance, a virtual model of cloth can be created by using Computer Aided Design (CAD) software and then can be rendered images of such model to mass produce its numerical instance (last order of simulacra). While the cloth that the designer is creating is not (yet) a real object, the same process can easily be applied to real objects using techniques such as 3D lidar scanning and photogrammetry (McCabe 2019), which are the methods that digital heritage studies use, as illustrated in the previous chapter. In each case, the result is not a single image taken from a single fixed angle, as conventional techniques did, but rather a quasi-mathematical description of the object that exactly (accurately) describes its extension in Cartesian three dimensions. Given the advancement in rendering techniques we have seen over the last twenty years, 3D imaging technology uses such spatial representations as its initial step to generate real objects indefinitely. Cultural heritage digitalization underpinning this has been in existence for some time and forms the basis of now familiar imaging technologies such Computer-Generated Imagery (CGI), VR, AR, or architectural visualization (Cohen 2022). Even so, I contend that recent advancements in accessibility, usability, and result quality should encourage us to view 3D visualization—scanning spatial agents as now central to the image production processes of contemporary visual culture due to the legitimacy of digital archiving of space and spatial objects as well as the digitalization of cultural heritage.

My interest in this ontological implication for the image itself derives from Walter Benjamin's widely quoted essay on mechanical reproduction and Baudrillard's

conceptualization of hyperreality, where images reorder the physical instances into mass production and where images function without any referential being or substance. As this linkage can be seen in almost every media critical study on the reproduction, my proposition tries to apply the roots of this framework to the digitalization of cultural heritage, which can better to understand how we should think of these new types of images. However, my approach goes further than McCabe's study on 3D imaging technologies, to explore the digitalization of cultural heritage emergence to situate it within the theoretical framework of Baudrillard's sign, simulacra, simulation, and hyperreality. To be more specific, this chapter draw upon the reformulation of the concept of the simulacra and hyperreality that Baudrillard offers in his *Symbolical Exchange and Death* (1993), *Simulation and Simulacra* (1994), and further discussed in his late works *The Violence of the Virtual* (2002) and *Why Hasn't Everything Already Disappeared* (2009). Baudrillard presents a highly provocative account of contemporary image circulation as a transcendental flux of simulation, with the perception being an acentric process that creates selections through this flux. Furthermore, I argue that this provides a valuable means characterizing and describing the digitalization of the cultural heritage milieu in which we find ourselves, particularly concerning how it recontextualizes conventional notions of preservation as generally employed within materialistic inquiry that is in itself problematic according to architectural, anthropological, archeological studies (Tanyeli 2016). Still, while the position is out of scope to cover all dimension of preservation of cultural heritage, in this chapter, I intend to focus on virtuality of the digital preservation in terms of providing a more detailed explanation of the simulation within recent practices of 3D digital archiving of the cultural heritage.

Going back to the seminal essay, *The Work of Art in the Age of Mechanical Reproduction* (1936), Benjamin discusses the presence of authentic cultural objects and stresses the value of material authenticity, contending that mechanical reproduction result in the loss of aura and iconic qualities. He examines the historical and technological advancement in art reproduction techniques and how they have affected how society values the work of art. These advancements that he exemplifies include the industrial arts of Ancient Greek foundry and stamp mill, as well as the historical skills of woodcut relief-printing, engraving, etching, lithography, and photography, all of which are reproduction methods

allow for a higher degree of accuracy in work of art's dissemination. His main articulation is how we copy any material instance to mass produce. He makes the following points to articulate that the uniqueness of *objet d'art* decreases over their reproduction by photography, simply imaging technologies:

> "Even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be. This unique existence of the work of art determined the history to which it was subject throughout the time of its existence. This includes the changes which it may have suffered in physical condition over the years as well as the various changes in its ownership. The traces of the first can be revealed only by chemical or physical analyzes which it is impossible to perform on a reproduction; changes of ownership are subject to a tradition which must be traced from the situation of the original" (Benjamin 1936, 3).

Almost a century later, it is highly difficult to redefine the digital reproduction of materiality or deconstruction of reality as a legitimate source of knowledge and the values that might emerge with digital reproduction technologies in the context of the materiality argument, which is inseparable from the deployment of vision as an objective source of knowledge and the object-centered practices it establishes. On the distinction between reproductions made by hand and those made using technology, Benjamin emphasized that while the original work retains its authority over copies made by hand, it cannot do so over copies made using technology for two-reasons: first, technical reproductions are independent of the original because they highlight the original's features and instill new standards of perception. He makes a point about the topic by using photography as an example since it may depict original elements that are only visible to the lens and not always to the human sight or perception. Second, by recontextualizing itself in space and time, the duplicates might be used in lieu of the original:

> "…technical reproduction can put the copy of the original into situations which would be out of reach for the original itself. Above all, it enables the original to meet the beholder halfway, be it in the form of a photograph or a phonograph record. The cathedral leaves its locale to be received in the studio of a lover of art; the choral production, performed in an auditorium or in the open air, resounds in the drawing room" (Benjamin 1936, 3–4).

That is the crucial circumstance, according to Benjamin, that devalues the material object's temporal and geographical uniqueness and separates it from the realm of tradition. This position is elaborated with the concepts of cult value and exhibition value

which photography surpass over the reproduction of such valuation as a new magical value. Kevin Robins opens up this position further in his article *Virtual Unconscious in Post-Photography* (1992) in order to reveal the unconscious motivation of new image technologies that insert themselves through visual culture. The particular assessment derives from Benjamin's original location that photography reveals an optical unconscious that we cannot achieve by our naked eye, whereas reality, in fact, gives new features to the lens of the camera.

The same analogy can be considered with the 3D visualization of cultural artifacts. While a work of art derived from authenticity and geospatial location and degraded into copies with photography, for Latour and Lowe (2011), this formulation can be two-fold so that reproductions can diffuse more authenticity to the original, with 3D visualization, such work of art can perfectly manufacture that permit even greater accuracy in reproduction of the work of art, but also a new optical unconscious which is miniaturization and decentralized point of view within Cartesian dimensions. In Benjamin's conceptualization, the relationship can be thought of only as horizontal or vertical if we dare to think of cultural artifacts' spatial plane in materialistic inquiry or camera's physical condition where it stands. This relationship with digital reproductions is now altered, even if they lie on the flat screen, the virtual space, so to speak, 3D software viewport, virtual camera and digital file formats open a new depth to such reproductions allowing us to view without any fixed angle. They become even more mobile and magical.

Following Benjamin's lead, Baudrillard asserted that digital reproductions would be marketed as an exact replica of reality and serve as a continuous, faithful, and impartial reproduction. He agrees that all historical and political reality will be reduced to information, a semiotic self-referential life (integral reality) since he sees digital imagery as a tool for the elimination of the real and mode of production. Baudrillard suggested that as there are more plausible surrogates, the power of the original to engage the senses, elicit an emotional response, and jog memory will be compromised, rendering the collection useless. In this sense, according to Benjamin and Baudrillard, one might claim the unique reveal of essence (aura) is connected to the history, ritual, and everyday life

that gave rise to the thing, giving it a voice that may elicit an emotional reaction from the audience that can only be found in the original material object. They both regarded reproduction as a tool for shifting the politics-based authenticity criteria away from rituals and away from the reality of objects, freeing them from their reliance on the real. While the digitalization of cultural artifacts removes any spatial practice (Lefebvre 1992), symbols, systems of signs, and the bodies themselves (observers), it appears as only a mere image. This can be what Baudrillard calls a surrogate reality as the "perfect crime" (Baudrillard 1996a). The actuality of reality has quite simply vanished under the glimpse of virtual real-time projections, for instance, in those cases that are illustrated as figures in this thesis. There is no longer needed to visit or interact with the original object, while its digital one provides more immersive experiences.

Paul Virilio (1991) also criticized the displacement of the dimension of direct observation and common sense, which resulted in the loss of the materiality and concreteness of the objects of perception, forming the realm of appearance and lived experience, as well as the loss of the object of ocular perception in the emerging forms of technological vision and representation. Within this context, one could say that our imaging technologies not only organize social relations over the present, but also recontextualizes the shared past and future of materiality in the body of digital reproduction technologies themselves. However, even if so, one cannot easily redefine that such technologies preserve our heritage; in fact, one should always consider the practice of reproduction that massifies and transforms cultural objects into digital/virtual objects where we shift the idea of cultural heritage preservation through the digital conservation of cultural heritage.

Regarding the primacy of "actual time" (over space and materiality) in his critique of technological extensions of reality, Virilio quotes Rodin's observation that the camera lies because time does not stand still (1994, 2). This is a clear distinction between the virtual and the actual time that technologies reveal from actual happenings in any image as real-time. However, there is no invention to claim the fact that we can see the reality in real-time in our display technologies. The media theorist Wolfgang Ernst has elaborated on this point of view, as he argues there is always a delay in the transmission of numerical information between digital devices and, so-to-speak virtual archives (2014;

2018). This supposition is also can be linked with digital preservation's actuality which only reveals a "reality effect," not the real itself, while clearly there is always a mediator and always a virtual temporal connection of the image: computers, cables, electricity, and so on. Like Baudrillard, who said once, "the war did not take place," (1995) while resonance that technologies only reveal events as a mere image rather than their truths, Virilio also analyzed and schematized the history of seeing under the aegis of "logistics of the image" in his book *The Vision Machine*:

> "The age of the image's formal logic was the age of painting, engraving and etching, architecture; it ended with the eighteenth century. The age of dialectic logic is that age of photography and film or, if you like, the frame of the nineteenth century. The age of paradoxical logic begins with the invention of video recording, holography, and computer graphics…" (1994, 63).

As the digitalization of cultural heritage preservation becomes functional within the reproduction of appearances, and always with human-computer interaction in the end, Virilio's multi-layered survey may be even more provocative than Baudrillard in terms of letting us reconsider that visualization only captures disappearances of the real, cultural heritage, or work of art. While the digitalization talks with already destroyed cultural artifacts such as Notre Dame and Temple of Bel and those that already disappeared along the passage of time and over the resurrection within Virtual Reality practices (History of Information 2019; Cohen 2022), Virilio's articulation can be a reminder to who claims that we are preserving our cultural relics with progression and development of such technologies: "So, we move from the persistence of a material - marble or the painter's canvas to the cognitive persistence of vision" (1999, 22–23). This is the critical translation that we must keep in mind on the digitalization of cultural heritage where in the case of the replacement of cultural properties is total, they repeat themselves identically in digital infrastructures, as Baudrillard might say, the violence of the virtual, "a perfect lure" (2002). In this sense, one must raise the question and ask, what happens to cultural heritage in common sense when it is freed from its truths and appearances within the process of digitalization?

The reproduction of the Temple of Bel Arch is a fine illustration of what can happen to common past and material relationships through 3D digital archiving of cultural

heritages. The Institute for Digital Archaeology (IDA) utilized digital photogrammetry method to create a virtual replica of the Temple of Bel Archway in Palmyra, which is situated in Syria, by taking pictures of the structure. A two-third-scale replica of the Palmyra's Temple of Bel Archway was erected in Trafalgar Square, London, in April 2016, which has shown a practice of virtual model generation from reality can finalize its materiality with physical duplication. There, it acted and erected as a political protest against the Islamic State's destruction of the original arch and as a historical reminder of the original. However, the IDA's arch has received some critical responses simultaneously (Factum Foundation 2019); for instance, Edwin Heathcote wrote, "…the publicity stunt has not been without controversy. It is costing a reported £2.5m, and some archaeologists believe the money could have been better spent on Syria's existing monuments" (2016).

Figure 3.1. The model of how the arch will look in Trafalgar Square. Source: Institute for Digital Archeology (2015).

Figure 3.2. After the 3D reconstruction processes the reproduction of arch erected in a geospatial location, and various media news reported (MINI 2020). Photograph: Pierre-Michel Virot.

In a Baudrillardian perspective, with the 3D visualization of cultural artifacts and generation of digital models, they simply become simulacra that such creations only serve as a simulation or a hyperreal of reality itself. In both cases, the generated model was not created only by CAD or CGI (simply an image *ex nihilo*); however, as they become subject to such production pipeline, they, in fact, reveal a new kind of interpretation that simulation now turns out an indicated computerized virtual reality where everything would be turned into a simulation of objects: a double-movement towards the death of the real. Today the whole system is drowned by indeterminacy, and every reality is of the code and simulation, says Baudrillard (1993, 2). The obsolete reality principle no longer guides us, and "we feed on those forms whose finalities have departed" (ibid.). The archival achievement in the digitalization of cultural heritage is that all kinds of material reality can be perfectly storage in the sphere of digitalized networks of preservation

systems.[3] For instance, when the arch of the Temple of Bel is captured in 3D, it can be reproducible through any content in any digital reproduction. For that reason, they can reveal more detailed standardization so that digitalized models can now function the same as the original, what they call it the accuracy of the scanning—capturing.

The capturing and reproduction mechanism are similar to what Baudrillard discussed in his conceptualization of simulation, ranging from Medieval counterfeits to Renaissance's production schemas. While going to the most extreme stance in his late work, he says "with the disappearance of the simulacrum as such, a later stage in the process of simulation has been reached, namely the simulation of a real more real than the real, the simulation of a hyperreal" (2002, 5). Echoing Baudrillard, "my hypothesis is that, a new kind of radical fetishism resulting from the eclipse of every process of meaning, underlies the transformation of the real into pure information and the cloning of the real by virtual reality" (ibid.) The virtual reality here is not the technical meaning of VR but the reality of the reproduction that we depend on so that we can preserve our cultural heritage rather than confess that we only conserve them in digital infrastructures and make their virtual copies within a tele- and hyper-presence.

While both critical thinkers traced reproduction with the development of technological tools and their position on the mode of production, today, we achieved a position that tools only turn out a digital network system to work it. As the final repository is digital, and we store such objects in digitalized networks, it would be beneficial to think with Baudrillard's conceptualization of simulation, where he starts from the generation of maps to the circulation of images as a departure from reality to hyperreality. With *The Mirror of Production* (1975), Baudrillard first departed from the Marxian metanarrative to examine the inceptions and workings of coding processing. Given the significance of sign exchange value and the code, he comprehends how the new political economy creates "a form of a general code of rational abstraction," which in turn supports "the circulation of values and their regulated equivalence of values" (Baudrillard 1975, 129–30). As such, digitalization's productivity (or UNESCO's shift on definition of cultural

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[3] Virilio argues that "whence the crisis in traditional forms of public representation (graphics, photography, cinema…) to the great advantage of presentation, of a paradoxical presence, the long-stance telepresence of the object or being which provides their very existence, here and now" (1994, 63).

heritage preservation) forces us to think about such abstraction or the displacement of the political where Baudrillard argues that the logic of hyperreality functions in accord with the structural law of value on the basis of simulation (1983, 81–102). He defines simulacra, in terms of commercial value, linked to a dominating production scheme in the industrial era, and natural value based on a logic of counterfeits during the preindustrial period by using the historical precedent of phases of the development in the functioning of the sign. In fact, the reproduction processes of its forms emphasize an eternally repeating succession of identical productions, resulting in an endlessly reproducing manufactured system of meaning and value.

In his usage of an analogy to the fable from Jorge Luis Borges' "On Exactitude in Science" Baudrillard embodied and reverberated this particular idea that the medium's presence exceeds that of the explicit content. Borges portrays an empire's concern by meticulously charting out its territory in it. As the plot progresses, the map enlarges to the size of the empire itself; it eventually ages and withers, blending into the surroundings as the empire shrank. This phenomenon is described by Baudrillard in the chapter "The Precession of Simulacra" as:

> "Today abstraction is no longer that of the map, the double, the mirror, or the concept. Simulation is no longer that of a territory, a referential being, or a substance. It is the generation by models of a real without origin or reality: a hyperreal. The territory no longer precedes the map, nor does it survive it. It is nevertheless the map that precedes the territory – precession of simulacra – that engenders the territory, and if one must return to the fable, today it is the territory whose shreds slowly rot across the extent of the map. It is the real, and not the map, whose vestiges persist here and there in the deserts that are no longer those of the Empire, but ours. The desert of the real itself" (Baudrillard 1994, 3).

It is not the territory's actuality that is shown in Baudrillard's interpretation of this story as the most exquisite allegory of simulation, but rather its simulation as a map that endures and in which individuals live as creatures caught one-to-one by cartographers. In this sense, any narrative that puts simulation only into computer-generated imagery does not explain Baudrillard's conceptualization. According to his interpretation of the simulation, one might wonder if the digital reproduction of cultural artifacts is comparable to the creation of a one-to-one map of the World Heritage with a vast number of digitally reproduced objects overlaid on it without a limitless scale (from 10cm objects

to high mountains). The map that the concept of digital heritage creates might one day become as pointless and unnecessary as the fictional one itself, which might mean to perish in the unfathomable digital datascape of the future.

As Mark Featherstone says, "the key theme of Why Hasn't Everything Already Disappeared is the symbolic violence of the empire of the good, the totalitarian drive to eliminate evil, eradicate nothingness, and create a self-identical image that has no external referent" (2011, 459). Whence the model of representation departs from the confines of the conventional Platonic relationship between form and image or thing itself and ventures into the hyperreality of the integral image where there is no referent or thing. In this sense, Baudrillard's concept of integral reality might help what transpires digitalization of cultural heritage:

> "Let us now enter this sphere of integral reality (we have yet to determine if this reality has one, or two, or three dimensions). Here is an example – integral music. It is heard in quadraphonic spaces and it can be "composed" on a computer. A music whose sound has been clarified and purged, a music restored in its technical perfection. The sound there is not the result of a form; it is actualized by a programme. A music reduced to a pure wavelength. The final reception, the sensorial impact on the listener is also programmed with precision like that in a closed circuit. A virtual music in other words, flawless, deprived of any imagination, mistaken for its own model, the enjoyment of which is also virtual. Is it still music? Nothing is less certain; it has even been suggested that noise be reintroduced to make it sound more "musical." The same can be said about synthesized and digital images, images that are pure creations, with no real reference, and from where the negative itself has disappeared – we are not only talking about the negative of the photograph but about the negative moment at the core of the image, an absence that makes the image vibrate. A digital image is technically perfect. There is no room there for fuzziness, no tremor either, or any space left for chance. Is it still an image then" (Baudrillard 2002, 3)?

By the same token, the emergence of 3D visualization, the technical perfection of heritage, and the birth of a new undead mode of reality and subjectivity—in a Baudrillardian sense it is tragic because it does not know that it is dead—results from the disappearance of reality into integral reality as opposed to the standard circuit of evolution, which revolves through cycles of birth and death. While 3D digital systems of representation may endeavor to appropriate representation of cultural artifacts, the dynamics of material reproduction turn all representations into simulacra, reducing the particular unique sign of the cultural artifacts to a valueless, free radical vagabond which can be paste to any exchange and anywhere in digitalized "preservation" network

systems. Hyperreality, simulation, and integral reality, therefore, can also be crucial for the digital preservation of heritage, which exist in a kind of vegetative state, caught somewhere between what is actual and virtual: a hyperreal heritage—exceeds and becomes transparent any ritual, tradition, materiality, or reality.

In the same vein, Zhang Xiao and Yang Deling (2019) recently provided a broader articulation of this emergence where they practice and conceptualize the cultural heritage's dissolution in VR but also its simulated empowerment within such technology. The homogenized heritage is turned back in time and represents for the viewer a plausible likeness of the original-like form in the present. Considering the Temple of Bel Arch's reproduction, it is a creation of materiality out-of-the-cycle that cultural heritage spectacle creates based on the need for symbols and dissemination; in other words, it is a "theatrical illusion" extending humanity's cultural memory (Debord 2014; Baudrillard 1994). While their consideration circled the collective memory using VR and hyper-presence as information interaction, I instead offer to investigate Baudrillard's thought of absence in the image, which is crucial to him as he also practices throughout his photographic theory (Smith G 2020).

While Baudrillard views simulation as a kind of erasure of reality, Virilio views it as a substitution in which technological reality takes the place of earlier methods. For example, film replaces the static representation of the real with moving images, virtual reality takes the place of real life. In the same vein, digital heritage replaces cultural heritage in the practices of 3D digital archiving. In contrast to Baudrillard, Virilio held the view that reality does not vanish but is instead replaced by another form of reality, a virtual reality: "Thus, there is no simulation, but substitution. Reality has become symmetrical. The splitting of reality in two parts is a considerable event which goes beyond simulation" (Wilson and Virilio 1994). Therefore, although for Baudrillard reality vanishes in hyperreality, for Virilio new technologies offer a replacement reality, a virtual reality that develops into something more potent and alluring than ordinary reality. In this comparison, the digitalization of cultural heritage might be a new mode of virtual reality in which UNESCO and other practitioners confront themselves as they are intensely preserving cultural relics.

Let me return to the beginning, where Carpo's indication and my proposition inserted a new paradigm shift that we are moving from two-dimensional representation to three-dimensional sophistication; starting from the cultural heritages, a new technological view has arrived. In today, with our imaging technologies, we have the ability to see spatial reality in Cartesian space geometry, which intersections progressively with the development of a new replacement reality. These reproductions might be informationally and symbolically would provide a new mode of seeing that depends on our environment rather than virtual recreations, but their networked social production shows that there still has to be sensorial mimetics to construct collective memory in virtual reality that they unconsciously provided. As our environment exploded with models (automobiles, furniture, clothes, smart devices, or anything that is digital), which gives way to simulation, this is a new achievement for hyperreality that we can copy what is already a copy into a new layer: *a copy of a copy of a copy* (Fincher 1999). Anything that can be created by CAD or CGI and put into reality (Disneyland), can be now turned into their initial model which is the case of digitalization's new horizon. However, what still remains problematic is how we can preserve the unique presence of the materiality of objects in space and time that Benjamin warned us from the beginning of visual reproduction.

As cultural heritage ownership becomes blurred, which is meant to belong to all of us, digitalization might enact a new authority that is virtually created by the system of politics, imaging technologies, and virtual reality. Thus, I attempt to redefine the digitally "preserved" heritage as *hyperreal heritage* through the simulation in which Baudrillard's "systemic anti-system" (Baudrillard 1997) "that tracks the disappearance of the object and its appearance as image, sign, simulacra, simulation, hyperreality, and integral reality" (Smith G 2020). This is a new realization of hyperreality where anything that has proper light conditions can also be turned into a simulation (not a simulation of computer imagery) by the network of imaging technologies. Yet, whether it is a simulation or virtual reality, one thing is clear, our imaging technologies' achievement has reached a new stage that cannot be overlooked and cannot simply be entitled as an accurate representation. Thus, the simulation of hyperreality arises from the erasure of

the distinctions between reality and representation, concept and object, and true and false copies. Does digital archiving of our cultural heritage can provide preservation to any extinction then?

At the end of this chapter, I aim to demonstrate how we started to turn from the digitization of images to the digitalization of space. By engaging with Baudrillard's phases of the image, which is simulacra's historical development, I propose an integral space of a new image that turns from a bare real (a reflection of a profound reality) to a molecular real (pure simulation in which the image or sign has no relation to any reality whatsoever). This visual study *makes an analogy* with Baudrillard's indication of successive phases of the image and questions how 3D visualization—digitalization of cultural heritage might resurrect an old fairy tale that is re-presenting the spatiality with its all dimensions. On the one hand, the study shifts from the plane of reproduction to the plane of the image itself, as the thesis itself tries to do so, in terms of executing the methodological and theoretical approach; on the other, it tries to get engage with digitalization processes' failures, errors, and glitches in order to add a new articulation that those documentation practices also include the practice's other side rather than conserve their perfectness, goodness, or achievements. Therefore, I try to break the ready-made assumption that these reproductions are pure simulation—virtual real. In contrast, I instead try to illustrate that this visual mechanism has just started to copy the real, it is a substation of the reality as Virilio disagrees with Baudrillard, yet, it has the potentiality to become the simulation of the real. Further, both senses of Baudrillard and those who elaborated this conceptualization with cyber technologies since the beginning of the emergence. What I am offering with this visual study is mainly that even our contemporary counterfeits, models, or simulations (the historical development of simulacra) are also waiting to be visualized in the legitimization of digitalization-digital archiving of our spatial real.

Through the use of iPhone 12 Pro's lidar scanning feature and mobile applications such as SiteScape and Scaniverse, which use Apple's *scanning and detecting 3D objects* algorithm (2021), this particular visual study challenges the value of the image and explores the possibilities of 3D visualization as digital preservation of cultural heritage

in the plane of the image. The procedure is split into five stages, each of which has been influenced by one of Baudrillard's tenets. *The sacramental order* is employed with a single snapshot which is digital and, therefore, can be also turned into itself the last stage as a pure simulation in which there is no real referent to be covered from the start. However, I assume that it somehow reveals a truth of the object, a bare reality, in relation to the plane where is the digital networks—protocols of information transmission that every image goes through simultaneously within a standardized code to be shown. *The order of maleficence* is demonstrated by the fact that perversion of reality is total in that it masks and denatures reality where the image does not faithfully reveal reality but can hint at an obscure reality. *The order of sorcery* is elaborated with the lidar scanning, capturing reality without any camera as conventionally invented, to prove that is a copy with no original. The image in this order claims to present something real, but there is no relation, let me provoke the process even further and say that there is no relation bound to even to the digital image or photography itself. The fourth stage shows its own pure simulation of the object, in which the image of the object has no relationship to any reality of the object whatsoever. This stage is illustrated with the point cloud of the object. The final stage, which is hyperreality or the *hyperreal heritage* (more heritage than the cultural heritage), can be thought of as two-fold: for once, it is the simulation of the reality that we cannot attend with our bodies or naked eyes, and second, it is the hyperreality of the image itself that the reflections of object create a new virtual spatial space, a space of virtual reality itself.

On the morning of December 2, 2022, the public water fountain was captured in the Scaniverse and SiteScape mobile 3D reconstruction applications to prove that the 3D visualization practice has reached a new stage. For the process to be successful the captivation needed to achieve the mobile device is moved without shaking as much as possible. The process is done in about two and half minutes to produce the digital copy of the object. The visual study intentionally shows the speed of technology without any intellectual or scientific knowledge to capture—preserve the cultural heritage (applications in use free of charge and works with a single button to record or digitally document). The height at which the process has been taken, however, has remained a glaring constant throughout the documentation process. Although the same production

method can be produced by the method of superimposing photographs (photogrammetry), the method of recording without a camera on a mobile device was created because Baudrillard's concept had not been addressed before within this technique to reconsider 3D capturing new media technology. The first-person point of view, or, in other words, my physical state or the actual recording device's physical position in actuality, is never exceeded because the documentation was done utilizing a mobile phone. The point cloud file created from side to sidewalk to cover as much of the cultural artifact's façade as possible. In order to prevent software misinterpretations, ensure a high level of application and mobile device's technological state-of-the-art, and demonstrate how digital preservation can mobilize to become a tool to replicate the space itself in digital repositories, a second capturing process or any external touches were not included in the process.


Figure 3.3. *It (the image) is the reflection of a profound reality.* The Fountain of Sultan Ahmed III is a public water fountain from the 18th century that was constructed in the Ottoman rococo style by the Ottoman sultan Ahmed III and is located in the grand square of Üsküdar in Istanbul, Turkey.
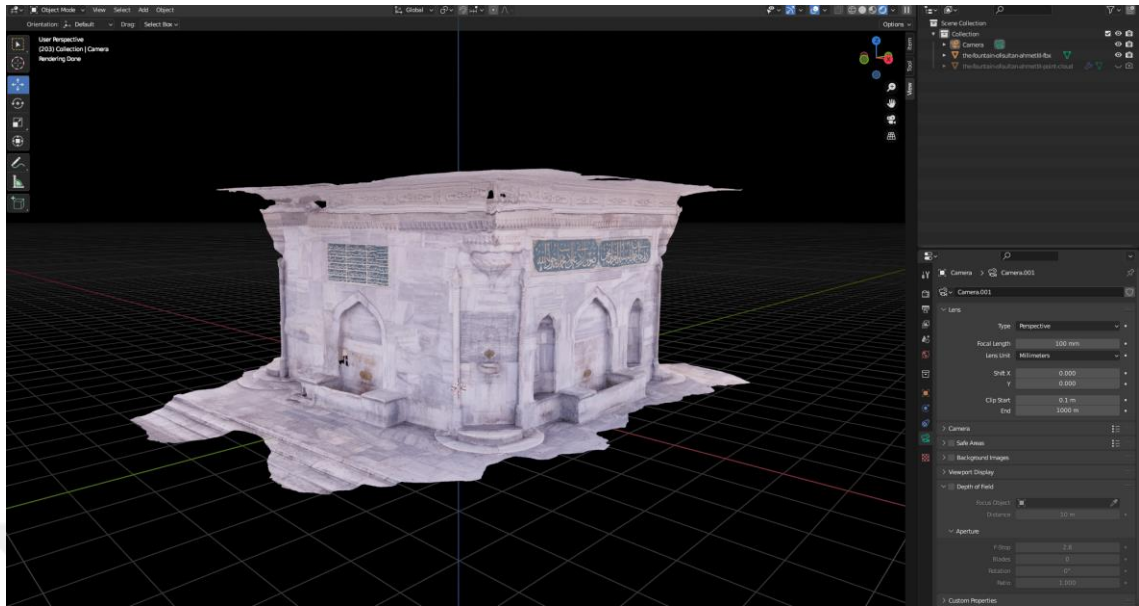
Figure 3.4. *It (the image) masks and denatures of a profound reality.* While there are an infinite number of points of view and ways to calculate the proximity-distance relationship without using a fixed scale, the virtual camera that is focused on the object deviates from an actual camera position where the displacement is double when we add the naked eyes of the observer. In this case, the sign or image may not accurately depict the cultural object but may suggest the existence of a hidden reality that the observer and the image themselves are unable to capture.
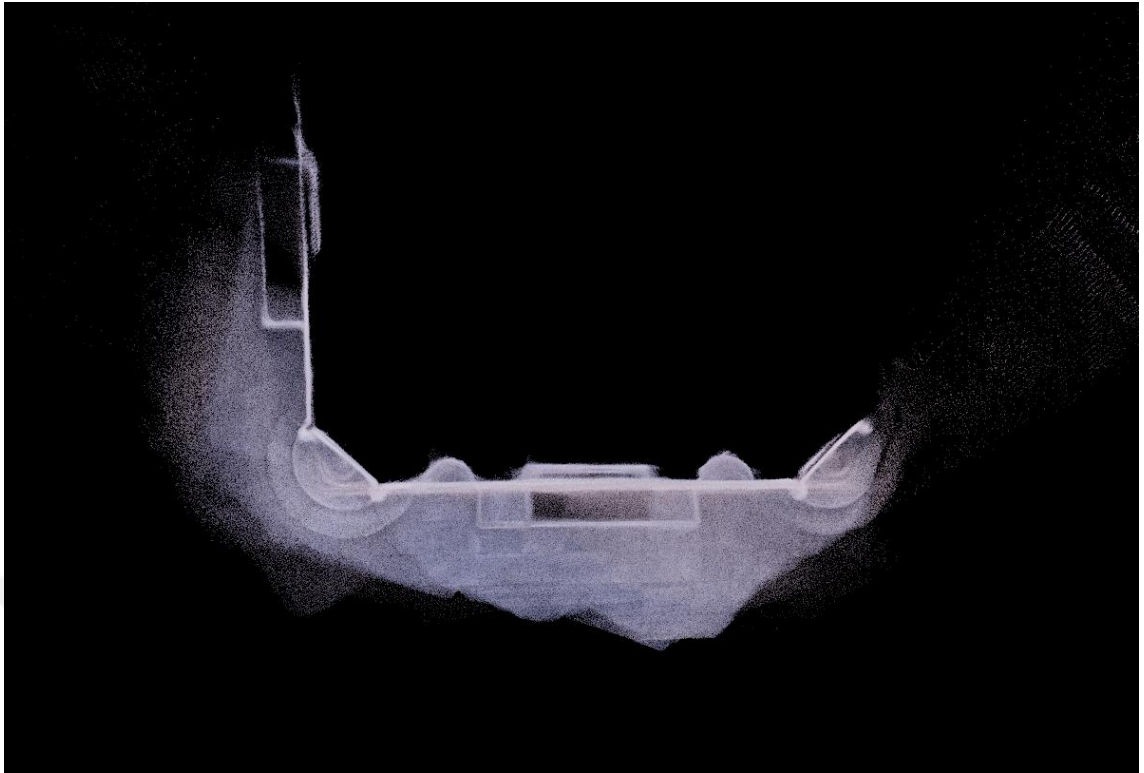
Figure 3.5. *It (the image) masks the absence of a profound reality.* The procedure, in this step, raises concerns about the validity, novelty, and how far a reproduction might be from the original until it becomes its own thing with no visible indication of its creator.
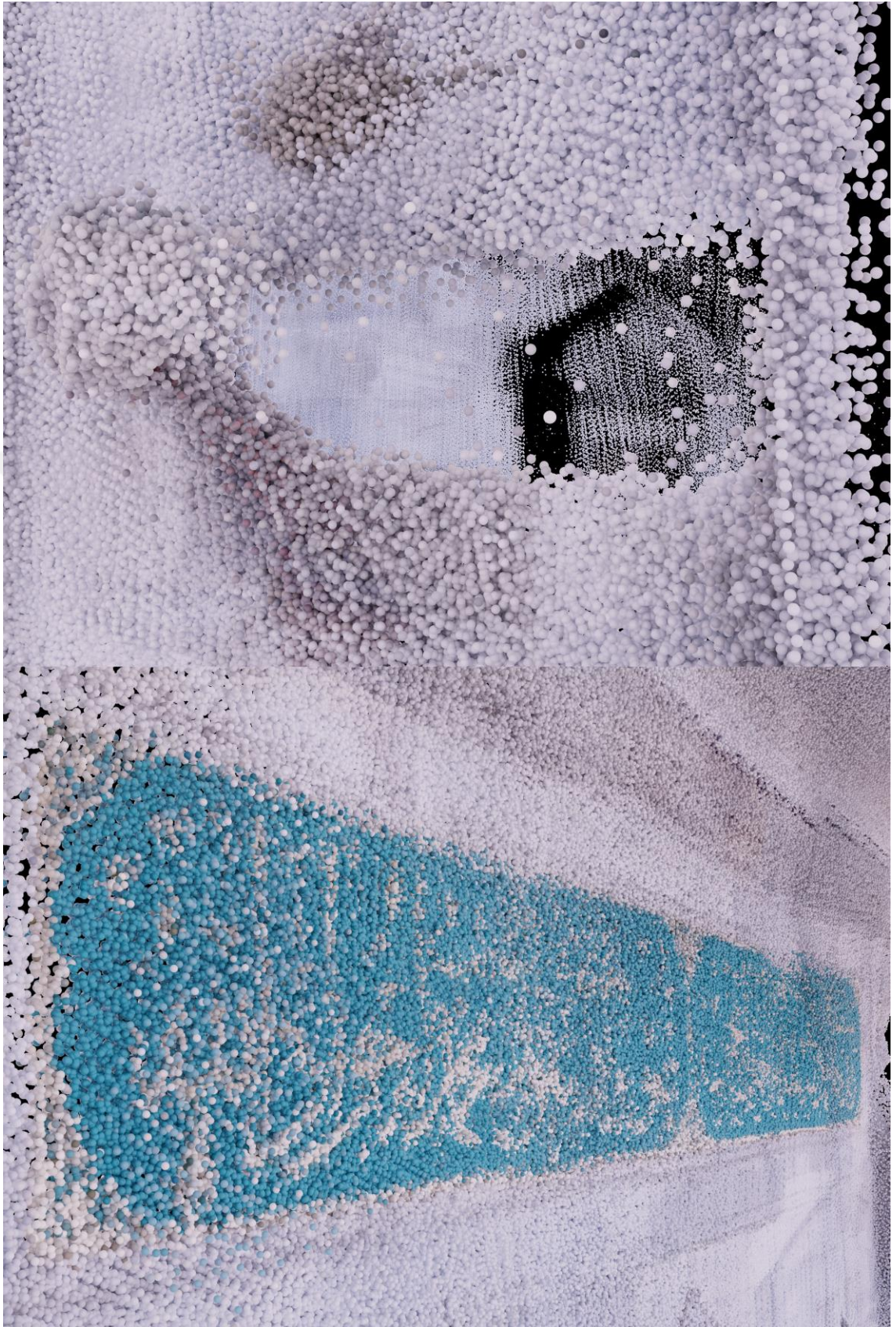
Figure 3.6. *It (the image) has no relation to any reality whatsoever: it is its own pure*

simulacrum. This is the fractal stage of image, there is no point of reference at all. With the zooming even those captured with an accuracy of 3mm, "they all contract[ed] to a single focal point, to a fractal form of *point* [time]" (Baudrillard 2005, 31).

Figure 3.7. The final stage of the image can be its hyper realistic rendering in the software. However, as it is counter-wise to my proposal, I instead attempt to indicate that "without illusion or transcendence, a purely conceptual acting-out, generative of deconstructed object which deconstruct us in their turn" (Baudrillard 2005, 107). Therefore, digitalization of cultural heritage destructs the cultural heritage twice, as we conceptually preserve their presence rather than their existence in real-time.

4. RECONSTRUCTION

"The simulacrum is not a degraded copy, rather it contains a positive power which negates *both original and copy, both model and reproduction*. Of the at least two divergent series interiorized in the simulacrum, neither can be assigned as original or as copy. It doesn't even work to invoke the model of the Other, because no model resists the vertigo of the simulacrum. And the privileged point of view has no more existence than does the object held in common by all points of view. There is no possibly hierarchy: neither second, nor third…"[4] (Deleuze and Krauss 1983, 53).

In the last chapter, I aim to re-manifest the concept of digital preservation within the digitalization of cultural heritage in order to make a comprehensive and permeable conceptual reconstruction of the case. To accomplish my goal, which is to provide a new articulation of contemporary advancement of 3D visualization—digital archiving of cultural heritage, I discuss further simulacra, simulation, and the concept of deterritorialization. Within the context of new imaging technologies, which will be positioning phenomenon that can be better understood; for instance, the preservation of cultural heritage debate around digital technologies can be reconsidered, or at least put on a different plane where it would be easier to approach around this reconstruction. As elaborated along the study, in general terms, digital heritage emphasizes the use-value of imaging technologies where cultural properties can diffuse their hidden and extensive values according to their digitalized materiality but also more immersive experiences. To take a different approach to this techno-logical affirm in this chapter, I will reconstruct digital against the virtual, where they used to be understood together.

With this, I attempt to claim that virtuality (virtual reality that technologies advantages as a discourse) have nothing to do with the problematic of the preservation of cultural heritage, rather it reshapes our understanding of such problems. In other words, this chapter emphasizes that 3D digital heritage is something not pure virtual as opposed to the real; rather, it is an actual pact through the metaphysical extension (Deleuze and Guattari 1987; Virilio 1991). The extension highlights the concept of digital preservation itself can be problematic or continuum of the heritage whether glorifies, enlarges, or destroys the reality (truth) of the heritage (physical conditions, rituals, aura) of cultural

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[4] Deleuze goes to overthrow the essence/appearance or model/copy.

artifacts. Yet, echoing Derrida (1994), the sanctification of virtuality within the digitalization of cultural heritage brings a new layer of dissolution always to remember, or at least reconsider when engage, which is the problematic of the problematic: a delusion—a denial of danger and lost object. The final suggestion has its roots in an analysis of how we can comprehend the digitalization of cultural heritage and the concept of preservation within the articulation of the simulacra, simulation, and territorialization process while executing Baudrillard's and Deleuze's differentiation on the simulacrum.

The simulation and the simulacrum are the concepts most essential to hyperreality, as was attempted to be maintained in the previous chapter with the cultural heritage's preservation transition from a reality to a reality alters the original (digitalization), essentially without any reference whatsoever. The simulation is distinguished by a blurring of reality and representation, with no discernible line delineating the boundaries between the two. A copy without the original is a common definition of a simulacrum, or as Deleuze put it, "the copy is an image endowed with resemblance, the simulacrum is an image without resemblance" (1983, 48). According to Frederic Jameson, the mass production of simulacra is one of the characteristics of late capitalism, which results in an environment that "marks our object world with an unreality and free-floating absence of the referent" (1992, 22). For Umberto Eco simulations are the simulacra's productive force of illusion, that "stimulates the desire for it" (1986, 44). Although diverse historical events are emphasized by theorists to explain hyperreality, which is also my main aim to reconsider within the digitalization of cultural heritage, recurring themes include the proliferation of new media technologies, the loss of the materiality of objects, the advent of capitalism, and consumerism.[5]

In *Simulacra and Simulation*, however, more radically, Baudrillard asserts that a successful simulation will not only trick the observer into believing in a delusion but also signify the demise of the genuine reality that it has replaced (1994, 5). According to him, who has been preoccupied with the idea of simulation in place of how it interacts with our conceptions of the real and the original, visual imagery's identity is revealed in this

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[5] For instance, any object can be sold to game development companies in the Sketfchfab.com. Or they can be an asset to any artistic research or creation. In this sense, digitalization includes same characteristic of previously described by previous technical and technological productions.

preoccupation as one of representation (sign) rather than something real (2007, 26). He categorizes those experiences in our life that are overtly mediated as merely being of a higher degree of simulation, one that simulates simulation in an effort to misrepresent a reality that exists outside of reality. This indication might also be the most crucial position that digital heritage acts upon it: a hyperreal heritage without any essence of existence which leaves its previous territory to a new territorial practice: a retinal one.

The terms simulation and simulacrum have subtly different meanings; one is referred to as something having merely the form or appearance of a certain thing, and the other is emphasized as a static entity, a mere image rather than something that imitates the behavior of the real thing on which it is based. The most important distinction between simulacrum and simulation can be that for Baudrillard is essentially the copy of a copy, that is to say, the copy of something that is not itself an original or real, hence an utterly degraded form; for Deleuze, the copy or simulation is an image *with* resemblance whereas the simulacrum is an image *without* resemblance (the immanent processes always contain *difference* in itself) (1994). That is why, according to Deleuze's interpretation, the simulacrum is not just a degraded copy, it has its own positive power, which breaks off the dialectic of the original and copy. Therefore, the difference between simulation and simulacrum arises from the different features of their likeness or semblance, a beyondness of representation.

When the digitalization of cultural heritage is evaluated with their uncanny nature, the results are not as harmful as in Baudrillard's premise of the approaching death of the real—the desert of the real. Instead, they open new avenues for interpretation in a critical space where experience might reveal new concepts rather than meaning being the primary concern. Simulacra, unlike copies, each have a unique inherent identity-differentiating power that is never static but also dynamic in the emergence of ever more distinct identities in their immanent plane. They do not repeat the same thing or anything similar since, in Deleuze's view, there is no authenticity other than the simulacra's differences from one another (Deleuze and Krauss 1983). Their (simulacra's) primary drive is one that conveys individuality via the recurrence of the unique—not merely a play of various

forms, but the development of materials that are uniquely their own.[6] They participate in and are a part of the world in this way.

According to Baudrillard, those that aim to elucidate object-subject relations without the aid of external systems of reference are tautological insofar as they require negative difference as a mode of signification, whether explicitly or implicitly (1994). This might reveal that digital archiving only has relative worth within or among itself. In this sense, even digital blueprints of cultural heritage, like any image creation, are therefore a simulation of reality. Moreover, the simulacrum resists conceptualization that would construct deciding connectedness between spatio-temporal reality and, as it were, an external concept-object; thus, to assert the difference for itself of the simulation is illogical. Both intellectual power (scientific or artistic knowledge in the case of digitalization of cultural heritage) and the concept (digitalization's binary opposition between technological development of the capturing mechanism) lack specific points of comparison from which it would be able to develop the kind of critical distance while necessary for either representation or identity formation. For that reason, from the Baudrillardian perspective, there is no longer a space or a distance from which a digital preservation practice may have protection in building immortalization discourse based on reproduction since simulation has superseded representation. This is because, from our technological gadgets to everyday life objects, everything is a copy of models that does have not any original referent. Thus, creating a model of a spatial agent is erasing the original twice that cultural heritage turns into a copy without any ritual, essence, appearance, or whatsoever.

A Deleuzian mindset would emphasize and depend on the significance of the concepts "virtual" and "actual," as well as how they differ in the conceptualization of Baudrillard and Deleuze. For instance, when Baudrillard radically asserts that "theory no longer has any use-value," (1993, 44), he truly means is that here is no longer a concrete point of

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[6] While there can be several digital file formats and protocols, within the thinking of their differences, the captivated information always differs from one another and must be touched by software in order to analogize in the body of the technical device the final form of reproduction to be seen by the observer. In this sense, their first step always starts with differentiation but nonetheless, the retouch contrasts them as same as possible. The light and spatial information data in themselves are always different, not to mention the virtual lighting and camera positions.

reference through which to ground notions in a reality principle since the reality principle is dead.[7] Therefore, according to Baudrillard, all immanent features themselves are simulacra of one another that are incapable of distinguishing the actual and the virtual. They all float without actual referent point (as implosion) but only gain value by trading against one another.[8] Deleuze, on the other hand, believes that there is a connection between the real and the virtual since those two things develop via an intensive process. In this sense, it is not possible to reduce the actualization process to mere representation (2001, 193). Simply because, in Baudrillard's thinking, the virtual is the unreal, something that is no concrete referent to any material instance, yet, in Deleuze's thinking, the virtual is fully real that can be illustratable with the example of Notre Dame's 3D digital reproduction in Assassin's Creed computer game, and more significantly in the digital infrastructures, not to mention the internet, that makes a clear distinction of what is seen or experienced on screen is still real, even if it is not actual.

Moving towards the case of the digitalization of cultural heritage through this discussion, the main processes consist only of the body of technical devices but also of a virtual point of intellectual production to which connect technical devices to one another where they are not able to reach each other without any human touch. While the Baudrillardian perspective would continue to insist that these processes only reveal the disappearance of cultural heritage, the Deleuzian angle might argue that the actuality of these processes is already an image produced by virtual potentials where the actual cannot be reduced to just being a result of the virtual, but rather that everything actual possesses a virtual capacity to transform into something else. This indication also shows that in the understanding of both authors, there must be seen as something radically different than virtual reality, just like the point where Virilio differs from Baudrillard's viewpoint.

In this sense, as VR or 3D reproductions of cultural heritage are already real phenomena in the body of the digitalized networks, their degradation to an absolute virtual might be

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[7] His position on photography also indicates same proposition and his analysis of the absence of the chemicals and material instance of photography within digital photography drives this point home (Baudrillard 2009).

[8] 3D digital files can be a prime example to refer to an analogy in this point of view. The files can be sent to the any geolocation without any loss, however, as they become omnipresent and self-referential (integral) every referent system becomes invisible or rather visible at their extreme to be not be seen the real one.

false. As every digital information must be analogized in the bodies of technical devices, their virtuality is only dependent on the distinction between what is real and what is a mere image/information which posits the understanding of digital and virtual separation to the case. This is where I stand on the side of simulacra's immanent power which is always in the process of becoming to the observer, of being different, and of changing what constitutes its nature as well as what constitutes its appearance (Barthes 1982). Thus, the digitalization of cultural artifacts is more than any representation of any materiality with previous conventional imaging production. Their appearance and point of view are therefore always in flux within technical and digital infrastructures. This differentiation is what will make them unique and precious in the future even if they currently degrade the original. However, as they are only a function to a beginning of digital archiving of our spatial realm, their conceptualization should be considered within the concept of simulacra where we constitute the representation, appearances, or symbolized desire to capturing reality or copying into a different plane as *it is*.

The 3D viewport where cultural heritage presents their unseen dimensions without any fixed point of view is the new simulacrum. While navigating digital objects one can fly through without any fixed angle as illustrated in the previous chapter. This no-fixed perspective is what creates the simulacrum of cultural heritage rather than their continuous flow in the body of digital infrastructures and telepresence. Previously, models were thought of as rationalizes stops on the path to a flawless item. The model was only a depiction of reality, not reality itself. We are witnessing a change in the conventional link between reality and representation. We no longer advance from model to reality, but from model to model while realizing that both models are, in fact, real. The cultural heritage has become a model that is a co-producer of itself, and digitalization of preservation or re-materialization amplifies this articulation. The situation brings the question of where they stored themselves and how they manufacture a new mode of production, in other words, the plane itself.

Digitalization of the cultural heritage with the 3D visualization has the ability to merge all communicational instances into one homogenous system, it has as similar primary characteristic the territorialization (Deleuze and Guattari 1983) of all symbolical or

communicational production onto one digital plane. From this point of view, I assume preservation of cultural properties is not something newly established or only empowered by digital technologies, however digitalizing the concept of preservation, or transforming it into a simulacrum surely is. As framed in the second chapter, 3D visualization technology's development in cultural heritage preservation relies on hardware and software where standardization is still remained and highly needed as seen as common problem. In the last couple of years, the network of 3D visualization technology has apparently increased and diverged into various approaches. However, there is no clear distinction on how they should (or might) serve to social production of cultural heritage.

For instance, as mentioned earlier, while photogrammetry uses multiple photographs (approximately 50-250 images) to merge every photo to create one single digital object, lidar scanners flashes electromagnetic radiant energy to capture object's reflection as a binary code in which more information will be gathered. On the other hand, what remains semblance is that both methods depend on same protocols to read and extract the information where cultural heritage becomes mere image and code across various digital file formats such as point cloud (ply), fbx, and obj. As a result, such digital files are also in circulation thanks to internet, software, and web platforms in a double movement. One can download them and interpret them in every detail. As such, the discussion becomes a conceptualization between 3D digital reproduction across technical devices (as cultural properties physics can now become virtually eliminated) and reterritorialization (ibid.) of mode of production through digitalization (as cultural properties can now function in the same code (0/1) without an external referent, they can be stored in the cyber infrastructures by the 3D visualization). Therefore, while there is clearly a movement through making cultural heritage digitally immortal, started with World Heritage in dangers, in order to make them more visible to people, my proposition is to make them even more visible (Baudrillard 2007, 25–26) with the examination of their digitalization, standardization, and codification. These are actual forms of digital preservation among technical devices and their algorithms across networks of information and communication technologies.

There indeed are deep differences among video, or image formats (which we know they might not be accessible if they are out of use or lack of digital protocols to read by technical devices), but all formats have similar physical processes that are necessary for any digital code to properly work. For that reason, any 3D visualization of cultural heritage depends on such binary opposition, but also the connection of cables, transmission of electricity, storage of data and display technologies where digital information is analogized in order to perceived by human senses. In this sense, there will be always a hardware/software issue in the digital preservation of cultural heritage which brings my proposition into that they are not wholly virtual rather they still rely on physics of our contemporary gadgets.[9] Thus, even though the digital heritage is still highly emphasized by Virtual Reality practices, it is still analog when we think of our everyday life tools—perhaps the contemporary heritage of our information and communication technologies for the future.

It is obvious that 3D visualization processes towards homogenization strengthens the preservation of cultural heritage as it increases its scope, categorization, archival notions, and accessibility, but it does not cover by itself the cultural heritage preservation network. In this sense, gauging the net outcomes of the digitalization of cultural heritage over the past two decades is not an easy task to cover in all dimensions. Industrial, technical, and governmental concepts are still locked into other rhetoric, narratives, and technics that are not attuned to digital politics running on cultural heritage preservation. Thinking about the plane of cultural heritage digitalization will also require thinking about its immanent features on the internet, mainly because they are re-materializing spatio-temporal artifacts within digital devices and publishing via networks of technical devices, software, internet, and intellectual knowledge. As such, even when we might think of the digital preservation of cultural heritage as a ubiquitous network across media, NGOs, researchers, or computers, its core can be found somewhere else, which is digitalized network itself that preservation becomes functional in a network of digital information conservation.

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[9] This is perhaps the point of Virilio that he opposed Baudrillard's conceptualization of simulation. Technology always intertwines with actual instances. Even in the VR glasses, which are our day-to-best foundation of a new reality, there are still some gadgets to wear, put on, and touch upon bodily.

Nowadays we have achieved audio and video signals in a standardization where any musician can publish a song and it can be playable between various mediums.[10] There is no doubt that advancing in 3D visualization in order to reach a sort of uniformity on the digital preservation even though it is evident that not all formats are created equal as sound or image data is codified as binary information. However, the line of inquiry is neither just can be considered within the articulation of recent technologies nor reproductions that such technologies diffuse; instead, the consideration lies in examining how 3D visualization and digitalization of cultural heritage preservation de- and reterritorialize the properties into the body of the digitalization.

Deleuze and Guattari describe deterritorialization as the process of leaving a territory. All species were originally territorialized in the water, and then certain species deterritorialized themselves by moving to land. They were reterritorialized on land, in other words. Concepts such as territorialization, deterritorialization and reterritorialization can be used to understand how digital heritage processes can be defined. Making digital copies of cultural artifacts requires steps as follows: *construction* (territorializaton with the captivation of appearances and shapes within technical devices), *deconstruction* (deterritorialization within the 3D software and computer-generated imagery), and *reconstruction* (reterritorialization within networks of digitalized systems such as internet, web platforms, etc.). Thus, the digitalization of cultural properties can be entitled as a becoming-digital of the artifact or a becoming-artifact of the digital. Best illustration can be found in the articulation of orchid and wasp's natural reproduction given in the *A Thousand Plateaus* (1987) as a concept describes rhizome, territorialization, and lines of flight:

> How could movements of deterritorialization and processes of reterritalization not be relative, always connected, caught up in one another? The orchid deterritorializes by forming an image, a tracing of a wasp; but the wasp reterritorializes on that image. The wasp is nevertheless derritorialized, becoming a piece in the orchid's reproductive apparatus. But it reterritorializes the orchid by transporting its pollen. Wasp and orchid, as heterogeneous elements, form a rhizome. It could be said that the orchid imitates the wasp, reproducing its image in a signifying fashion (mimesis, mimicry, lure, etc.). But this is true only on the level of the strata-a parallelism between two strata such that a plant organization on one imitates

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[10] Previously this is done with Compact Discs. There are several compact disc companies that tries to maintain digital data against time. The protection of data itself is the digital preservation's other side to be consider.

an animal organization on the other. At the same time, something else entirely is going on: not imitation at all but a capture of code, surplus value of code, an increase in valence, a veritable becoming, a becoming-wasp of the orchid and a becoming-orchid of the wasp. Each of these becomings brings about the deterritorialization of one term and the reterritorialization of the other; the two becomings interlink and form relays in a circulation of intensities pushing the deterritorialization ever further. There is neither imitation nor resemblance, only an exploding of two heterogeneous series on the line of flight composed by a common rhizome that can no longer be attributed to or subjugated by anything signifying (Deleuze and Guattari 1987, 10).

According to Deleuze and Guattari, deterritorialization may be viewed as the catalyst for technological development (1987, 67). For instance, the division of labor results in the deterritorialization of tool-making expertise, which is a step of deterritorialization and correlates to the rise of urban concentrations in the form of ancient empires. The Middle Ages and the Renaissance, when the tool-making professions established their areas in the form of guilds (carpenters, stone masons, blacksmiths, watchmakers, tailors, etc.), further strengthened this division and specialization. We may say that guilds reterritorialize human beings' ability to create tools. Furthermore, another step of deterritorialization appears during the Renaissance when certain building-related processes leave the sphere of craft and establish new territories that are solely populated by signs. Plans, sections, and façades are produced as programs or schematics by the profession of architecture. These modifications are but a portion of a larger cultural shift that occurred throughout the Renaissance and Baroque periods, during which signs became a world unto themselves with a distinct autonomous order. This historical transition is what Jean Baudrillard calls orders of simulacra.

The deterritorialization can be extended further to the emergence of industrialization and mass production. The domains of the guild and their skill-based competencies are eventually fragmented by industrialization and mass production, and they are reterritorialized in the factory. As such, within an analogy of a cultural artifact's first purpose of creation in between its creator and users; and then it is becoming-heritage of the society or as becoming-society of the heritage: an artifact can function out of its initial scope and can reveal new symbols and signs according to its valuation.

Deterritorialization can be extended even further with the association of the birth of code which makes for a synthesis of two layers or strata: function and form (Baudrillard

1996b). Everything has a way of converting a rational process into a reasonable form. Form comes after the function. Not just in conventional preservation where technologies adopted in order to more advanced rehabilitation but also in the case of digital preservation where cultural properties can be functional for many other purposes such as game-environment (map) creation, education, exhibition as CyArk emphasized. In this sense, they exceed their particular value, geographical boundary, or material existence. They become a byproduct of this fundamental deterritorialization in 3D reproduction, which turns anything into a digital fabrication suitable for any industrial mass production through a reterritorialization. Thus, deterritorialization, which regarded as a key aspect of the globalization of cultural artifacts, denotes the increasing presence of social forms of contract and involvement that transcend particular territorial bounds, which leads to a closer involvement with the external, which creates closeness in distance, and to a relative distancing from what is close. This position is where that Benjamin (1936) articulated the aura of a historical work of art in which photography mass reproduced and degraded the particular uniqueness.

Another pinpoint can be dropped in the era of mass communication: tools' function is now only regarded as a subset of communication. As UNESCO's World Heritage Convention intension is initially developed and extended into this vision, cultural heritage properties now turn onto themselves in which their knowledge becomes more valuable than their actual existence. The focus turns from preservation of objects to preservation of object's notions. The connective synthesis of 3D digitalization produces not the closed binary couple, so to speak, this and that, but rather an open-ended series this and then that and then this… From this point of view, Deleuze and Guattari's conceptualization and application through this generative power of the digitalization of cultural properties can play a fundamental role where deterritorialization involves a "double-becoming." When a cultural item is digitally rematerialized, it loses its hierarchical, linear, or genealogical tree-of-structure qualities and instead develops a decentralized, reterritorialized, and rhizome-like root structure. This process, in summary, can be reconsidered in three reproduction steps such as reproduction to industrial mass production (game-environment assets), transformation into communication and system of signs, and transportation to absolute deterritorialization where they become lines of flight.

The last phase of deterritorialization can be reconstructed in the forms of heritage preservation with the networks of digitalization. As Stanford Encyclopedia of Philosophy (Smith, Protevi, and Voss 2008) on Deleuze argues, according to Deleuze and Guattari's interpretation of the anthropological literature, tribal societies mark bodies during initiation rituals so that the offspring of an organ can be mythically linked to a clan, which is then linked to the earth or, more specifically, one of its enchanted regions, which serve as the organs on the whole earth. As a result, material flows are territorialized, or tracked back to the earth, which is given credit for being the origin of all production. These tribal meaning codes are over coded by empires, who attribute productivity to the despot, who is seen as the divine father of his people. Despotic empires' material flows are therefore deterritorialized (they are no longer ascribed to the earth), and then they are promptly reterritorialized on the despot's body, who takes credit for all creation (ibid.). The signifier is created as a "deterritorialized sign" when tribal signals are overcoded, enabling communication between the conquered and the conquerors.

In today, we find cultural heritage of those tribal societies or despot's work of art are now reterritorialized in the body of the digitalization who takes credit for all new productions. Notre Dame's lost roof now belongs to its data storage which cannot be returned to its material existence but in fact, can be rematerialized thanks to the various applications of digital preservation approaches. Therefore, the duty is not to mention their "virtual" existence but rather talk about their reality of the virtual which is a real more than reality itself. The radical decoding and deterritorialization of the creation of materiality that earlier social machineries had diligently inscribed on the soil, the body of the despot, or the body of capitalism are what is meant by the digitalization of cultural heritage. The material flow now begins with digitalized networks from our spatio-temporal reality to our digital networks of the future.

In this sense, the question is whether virtuality (virtual reality) is sufficient to understand all the features surrounding new technologies that indicate a new realm to our banal environment. Digitalization cannot expand reality to satisfy human beings' exterior requirements. This chapter has discussed how the difference between the digital universe

and the analog world helps us understand the potential of digital, which only exists in the former. The digital expands the world without bounds under the conditions and possibilities of the latter, which are primarily logical and, by the same token, are limited by hardware constraints. However, it is this situation that Baudrillard criticizes that takes away the truth. As hyperreality, simulacra, or simulation of cultural heritage within digital archiving cannot be stored with only one perspective, there is indeed an urgent need for the involvement of critical media studies that might put this emergence to a different plane which can be better to develop this technology to further. I prefer to stand on the middle in against to any radical criticism, but we need to preserve particular work of art, architecture, in other words, our common heritage for the future to be inspire, remember, or at least be conscious that we arrived here from a point of view. In 3D display technologies we will get a vision that our naked eye cannot attend. However, one should always remember that it is not the actual real; it only can be a mediatization to be conscious about it. In this sense, as this emergent can be entitled as *post-post-photography* where Deleuze's articulation of montage (Deleuze 2001) did once, the hyperreal heritage might be compassed by symbolic and imaginary where the real eludes representation.

5. CONCLUSION

Different simulation approaches provide various conceptualizations of images and would depict the digitalization of cultural heritage, which has a significant influence on the social and political realm. This thesis explored the relationship of digitalization of cultural heritage through a transfusion of preservation and conservation entanglement. It is argued that the recent trajectory not only brings aid to heritage but also might bring the most fatal danger, which is constructed within the perspective of Baudrillard. While his approach to simulation historicizes the Platonic notion of the real, the real based on a reality is replaced by simulation; Deleuze's understanding of reversing Platonic simulacra defined the new avenues of cultural artifacts. Up to date, contemporary imaging technologies have created a more immersive experience; however, as it is argued, their actuality reveals that is still depends on our physical materiality itself. Our technological objects try to get rid of this problematic in order to provide an even more immersive experience of a new reality: the reality of our virtual creativity within the digital mode of production.

According to Baudrillard, reality is socially produced, and the contemporary world no longer adheres to the reality principle. As he explains the simulation theory inside the Platonic dualism that is taken for granted, he contends that images now serve as simulacra, replacing the real and producing the hyperreal. As every material investigation loses its source and core, hyperreality is defined by inferiority. In the case of cultural heritage digital archiving practices, there is indeed a long road taken and improved to how to see the hidden and exclusive feature of any materiality with the lens of the camera or cameraless capturing (lidar scanning). However, as the Baudrillardian approach would criticize this kind of transportation through the digital realm, their unique existence is in danger within such imaging progression. While the social life of cultural heritage (its onlookers, rituals, neighbors components) is removed by the 3D visualization, the digital objects promote themselves as a consumer good to keep heritage disseminated through the observer. Sketchfab is a pure example.

In this thesis, the conceptualization of hyperreal heritage is used as a theoretical basis for the critique of the dominant digital preservation practice that displays space not *as if*

(simulacrum) but rather *as it is* in a higher level (hyperreal). The utilization of the Notre Dame Cathedral and Temple of Bel is seen to be a phenomenon that is directly related to the body of the digitalization process, thus legitimizing this practice. In thesis critical perspective, reconstructing cultural heritage's material information as digital objects via several imaging operations such as digital photogrammetry, lidar scanning, 3D software editing, rendering, and virtual lighting does not bring any aid but reveals a denial of the lost object which is our common reliance on digitalized networks that everything can long live for to be used in the future. In this way, UNESCO and other organizations practice the possibilities of 3D visualization with the aim of resurrection and reterritorialization of the heritage

Deleuze's idea of reversing Platonism and his collaborative work with Guattari provide a distinct method of simulation that fundamentally transforms the foundation of identity, cultural legacy, and their interrelationship. His method considers simulation beyond the original/copy dilemma. The difference between the original and the copy is therefore not one of degree but rather of nature. This viewpoint challenges Platonism, which is founded on dichotomies such as "material" and "immaterial," "real" and "virtual," "original" and "fake," and "model" and "copy," and suggests a deterritorialization act to liberate the ideas of "original," "copy," and "simulation". As UNESCO's and other initiatives' destination is to make free the geospatial location of cultural artifacts, Deleuze and Guattari's proposal of change of thought can be a baseline for their intentions. As their goal was to develop a new way of thinking, one that is nomadic, always changing as life itself, digital archiving of our spatial realm can benefit from their thinking to process such technical potentials.

To find a political basis that permits any meaningful act to be carried out in a time when Baudrillard announced the end of reality, the moment of arbitrariness, and a meaningless flow around an empty orbit, Brian Massumi (2021) used the Deleuze-Guattarian idea of simulation. As objects, their images, and information embody potential mobility and new possibilities more than ever before, Deleuze and Guattari's philosophy might be the valuable source to redefine digitalization cultural heritage as not as negative but as a positive simulacrum. As such, with recontextualization and deployments of

omnipresence, telepresence, or hyper-presence; cultural heritage, in fact, create a new mode of simulation that makes a possible political statement in which it frees any pre-existing frameworks and frees the image articulation in between original/copy dichotomy. As a result, our shared heritage can also reveal the contemporary way of seeing, how we are preserving something real, but we must deal with the consequences of collateral damage, which is the consequences of a shift from a real to real without any referent or being: a simultaneous *becoming*. For that reason, finally, I believe that we still need to preserve particular artifacts to inspire us to show the *difference* between what *was* and *is*.

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