



McDONALD INSTITUTE CONVERSATIONS

# Authenticity and cultural heritage in the age of 3D digital reproductions

Edited by Paola Di Giuseppantonio Di Franco,  
Fabrizio Galeazzi and Valentina Vassallo



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Edited by Paola Di Giuseppantonio Di Franco,  
Fabrizio Galeazzi and Valentina Vassallo

*with contributions from*

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## Foreword

# The era of digital replication

Sarah Kenderdine

A digitally recorded copy... can be both a lode of 'forensically accurate information' and a vehicle for provoking a 'deep emotional response.' (Zalewski citing Lowe 2016).

With our increasingly sophisticated processes of digital replication, the debates surrounding issues of aura and authenticity of the copy have emerged with vigour in the public domain. Let us consider the case of *The Next Rembrandt*. Purportedly devised by advertising executive Bas Korsten as part of an advertising campaign for ING Bank in 2016, *The Next Rembrandt* is the product of a computer program that utilizes data derived from 168,263 Rembrandt painting fragments to compose and 3D-print a textured, 'painted' image (Brown, 2016). *The Next Rembrandt* is considered by its creators as new work of 'art' in the sense that it is not a composite of features from Rembrandt originals, but the result of a pattern recognition program that has generated new features. However, the responses to *The Next Rembrandt* have been polarizing. While Korsten hoped the project would be 'the start of a conversation about art and algorithms', mixed public and critical responses to the images signified the strength of traditional concepts of fine art, genius and authenticity and, the reverence for auratic masterpieces prevalent in society today. The inevitable comparison between *The Next Rembrandt* and actual Rembrandts resulted in the accusation of 'fakery' and the presumption that Korsten and his team have been engaged to reduce artistic 'genius' to a series of imitable features. Jonathan Jones of *The Guardian* wrote:

What a horrible, tasteless, insensitive and soulless travesty of all that is creative in human nature. What a vile product of our strange time when the best brains dedicate

themselves to the stupidest 'challenges', when technology is used for things it should never be used for and everybody feels obliged to applaud the heartless results because so revere everything digital... What these silly people have done is to invent a new way to mock art. (Jones, 2016)

Despite Korsten's insistence that he has 'creat[ed] something new' through algorithmic processes and that 'only Rembrandt could create a Rembrandt', Jones clearly resents the perceived implication that 'great art can be reduced to a set of mannerisms that can be digitised' (Brown, 2016; Jones, 2016). For detractors of digital facsimiles, several key structures of art are at stake in *The Next Rembrandt* including, the aura of the masterpiece, that which is deserving of the 'Rembrandt Shudder', the impact of the artist's psyche on the work of art and the exclusive rights of the original and authentic art object to be a result of 'genius'. Aura is tied to authentic originality and context, and the possibility of artificial processes for creation calls into question which aspects of the context and provenance of a work of art are most important to the category of 'art'. Jon McCormack et al. (2014) ask, 'Why dismiss outright that a machine and a human might share experiences that result in something meaningful and worth communication?' (p. 135). In Korsten's words: 'Do you need a soul to touch the soul?' Besides the implication that the creators have attempted to pilfer a portion of the aura of a Rembrandt, the sheer resemblance of the computer-generated piece to that of an actual Rembrandt prompts questions of the importance of authentic experience. Jones's outrage is at least in part motivated by the notion that *The Next Rembrandt* is a fake – even though it is not a copy or computer-generated duplicate of an extant composition.

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These forceful debates sit within a period in our history where iconoclasm, the destruction of cultural property for political ends, is a weapon of choice. While the annihilation of heritage and its keepers have been with us for 1000s of years, it remains one of the most powerful political & socio-cultural weapons of our times. Director General of UNESCO Irina Bakova says we are currently witness to extreme forms of cultural cleansing. And she reminds us that education about heritage is a cultural emergency and this should be taken a political and security imperative. Add to this crisis, climate change catastrophes, natural disasters and destruction of sites through mass tourism, digital replication has emerged as the key topic for cultural heritage in the present. The authors of the chapters in this book are at the heart of a potential revolution of safekeeping of cultural objects and heritage sites, afforded by high quality digital facsimiles. The assemblage of chapters provides us much-needed theoretical scaffold to validate 'the copy' in perilous times.

High-fidelity digital copies have often struggled to escape the stigma of data-driven, didactic visualizations. Stuart Jeffrey argues, for example, that digital objects have been perceived to possess an inability to inherit 'aura' due to a neglect of creative imagination (Jeffrey, 2015). He identifies five key traits that digital objects must overcome: their lack of physical substance compared to real objects, their lack of

native location, the ease of their infinite reproducibility, their inability to degrade and the difference between original ownership and digital licensing. Through critical theory and a series of case studies, data standards and fieldwork techniques, the book addresses issues raised by Jeffrey and others concerning diverse themes such as authority, authenticity and aura, new materialism, circulation and reproducibility and the experience of (digital) aura. Each chapter is part of an emerging and critical restructuring of how we perceive the copy in relation to the original. As a collection of perspectives on these issues, it is both timely and essential reading.

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# Introduction

## Why authenticity still matters today

Paola Di Giuseppantonio Di Franco,  
Fabrizio Galeazzi and Valentina Vassallo

This blind man, an old friend of my wife's, he was on his way to spend the night... Something about the church and the Middle Ages was on the TV... the TV showed this one cathedral... Then something occurred to me and I said: 'Do you have any idea what a Cathedral is?'... 'Cathedrals' the blind man said. He sat up and rolled his head back and forth. 'If you want the truth, bub, that's about all I know... But maybe you could describe one to me?'... 'Hey, listen to me. Will you do me a favor? I got an idea. Why don't you find us some heavy paper? And a pen. We'll do something. We'll draw one together. Get us a pen and some heavy paper. Go on, bub, get the stuff,' he said... He closed his hand over my hand. 'Go ahead, bub, draw,' he said... 'Close your eyes now'... 'Don't stop now. Draw'... Then he said, 'I think that's it. I got it.' 'Take a look. What do you think?'... My eyes were still closed. I was in my house. I knew that. But I did not feel like I was inside anything. 'It's really something,' I said. (Raymond Carver, *Cathedral*, 1).

### Defining authenticity

The idea for this book came after a session organized by the editors at the 2015 Annual Meeting of the European Association of Archaeologists (EAA), entitled 'Re-defining Authenticity in the Age of 3D Digital Reproductions'. The book includes contributions from some of the panellists attending the session and from invited scholars who have been working on the theme both theoretically and through specific projects. The general scope of this book is to introduce and discuss the epistemology of the concept of authenticity with

the focus on how it can be defined and 'achieved' through digital replicas. The challenge of this work is to analyse the concept from different perspectives and with different multi-disciplinary contributions, together with theoretical debate. This volume represents the first attempt to collate an organic collection of contributions on authenticity and the digital realm in heritage and archaeology.

Why authenticity? This is a much debated concept as it is assumed today that authenticity is defined by Western views of heritage. To study the etymology of the term, in a fascinating paper Lionel Trilling (1973, ii) goes back to the medieval term *sincerity*: 'Before authenticity had come along to suggest the deficiencies of sincerity and to usurp its place in our esteem, sincerity stood high in the cultural firmament and had dominion over men's imagination of how they ought to be'. Long debates on how heritage should be defined have brought authenticity into play. While organizations such as ICOMOS and UNESCO (to name just two of the best-known) have institutionalized the term, conflicting and sometimes more decentralized views have criticized, even denied, the existence of authenticity (going back to Baudrillard and his idea of heritage as 'a real without origin or reality: a hyperreal'; 1994, 1). Even though efforts have been made recently by members of UNESCO to incorporate conflicting views of heritage and authenticity, we believe that they have failed at least in part, since what Laurajane Smith defines as Authorised Heritage Discourse (AHD; Smith 2006) is principally defined by the idea that we need to preserve the authenticity of our heritage. For this reason, we believe that a study of authenticity is central not only to the definition of heritage, but also to the practice of digital heritage. Digital heritage practices have the power to replicate infinitely the AHD or, conversely, to find new ways to re-define the authenticity of heritage and incorporate conflicting views on this concept.

Heritage and museum specialists have institutionalized authority to protect and preserve the authenticity of the past, especially in the Western world (e.g. NARA Document 1994; Venice Charter 1964). While audiences, communities and the public usually engage with this institutionalized past, new media, 3D technologies and the internet can, potentially, challenge the AHD. The use of 3D replicas for the preservation, analysis and dissemination of cultural heritage is well established today. The practice of digitally replicating heritage goes hand-in-hand with the central question of if and how the 'authenticity' of heritage can be 'reproduced', which is also an ontological question on how we define authenticity and an authentic object. As is well expressed by Andrea Witcomb (2010), contemporary discussions on the impact of multimedia technologies on both museums and archaeology and heritage more broadly tend to assume a radical difference between the virtual and the material world, a difference that is conceived in terms of a series of oppositions. The material world carries weight – aura, evidence, passage of time, the signs of power through accumulation, authority, knowledge, and privilege. Replicas, on the other hand, are perceived as the opposite of all of these – immediate, surface, temporary, modern, popular, and democratic. In other words, this discussion emphasizes a dichotomy between original (authentic) artefacts and inauthentic replicas. This discussion is based on the assumption that while original artefacts possess an 'aura' – arising from their uniqueness as an effect of a work of art being uniquely *present* in time and space – once the objects are reproduced they become merchandise, and as a consequence they lose their aura. This point is connected to the idea of *authenticity*: if there is no original, it is never fully present anywhere. Authenticity cannot be reproduced, and disappears when everything is reproduced. Benjamin (1968) argues that even the original is depreciated, because it is no longer unique. Along with their authenticity, objects also lose their authority. The masses contribute to the loss of aura by seeking constantly to bring things closer. They create reproducible realities and hence destroy uniqueness.

The contributions to this book, however, suggest that these dichotomist distinctions between originals and replicas are far more complex than they might at first appear. As was well demonstrated by the international discussion that resulted in the NARA Document (1994), the *authenticity* of cultural heritage is culturally mediated and implies specific *significance* and *values* that are applied to cultural heritage by *diverse* groups of people in specific and/or different *times*. Similar assumptions can be applied to the replica, whose level of authenticity can be defined based on its mode of

production and consumption and the social values attached to the replica by different cultures and in different times (see the contributions of Jeffrey and Beale in this volume).

Based on these assumptions, some scholars even question Benjamin's statements about the loss of aura experienced by replicas and see instead a 'migration of aura' from the original to the copy. This claim is reiterated by most of the contributors to this volume. Recently, Bruno Latour and Alan Lowe considered how it might be possible to migrate the aura to the reproduction or reinterpretation of the original (Latour & Lowe 2011, 283). They underline the obsession of the age for the original, and how this obsession increases as more accurate copies of the original become available and accessible. Latour and Lowe argue that 'the real phenomenon to be accounted for is not the delineation of one version from all the others but the whole assemblage of one – or several – original(s) *together with its continually rewritten biography*' (Latour & Lowe 2011, 278). The possibility of retrieving the aura from the flow of copies has to be reconsidered today.

Digital replicas have complex and dynamic relationships with the original heritage objects they represent. These involve forms of partial migration of aura and the generation of new types of value and authenticity (Jeffrey et al. 2015; Jones 2010; Joy 2002). 3D printing creates a further element of complexity as the digital object 'migrates' back into the material world.

In this monograph we intend to challenge and reconsider the notion of authenticity in digital archaeology and digital heritage studies. Our papers explore the concept of authenticity in a comprehensive way, engaging with theories relating to the commodification of ancient material culture, heritage-making processes, scholarly views, and community engagement. These papers also take into account current digital practices for the study of past material culture and how their use affects and redefines interpretation processes in archaeology. Various sub-themes related to the topic of authenticity are discussed in all the contributions to this volume: materiality vs constructivism theories, object biographies, authority vs power, and experience vs performance.

### Materiality vs constructivism

According to Fiona Cameron and Sarah Kenderdine (2010), in the last few years much of the discourse about the relationship between cultural heritage and digital technology has been descriptive and introspective, focusing on projects and their technical considerations. In other words, the discourse has often started from a materialist view of authenticity that relies on the idea

that there is an objective basis for the definition of authentic cultural heritage. This is exemplified by the contribution of Sorin Hermon and Franco Niccolucci (Chapter 3) who were involved in the creation of the London Charter, an essential document for digital heritage practitioners as it sets out guidelines for a transparent process of digital replication and reconstruction of cultural heritage. The London Charter focuses on what we might call the reconstruction of surface-authenticity or the authenticity of surface, that is, the metric reconstruction of surface information. The chapter by Lola Vico Lopez (Chapter 2) shows how the London Charter, combined with guidelines dictated by other charters for the restoration of original monuments (e.g. Italian Restoration Charter), has influenced digital processes of 3D reconstruction.

Cameron and Kenderdine concur that there is a need to move away from the formalist notions of technology and materiality that make digital objects fit into the specific rubric of 'replicant' which has constrained their value, meaning, and imaginative use. Nonetheless, we believe that this formalism, as defined by the London Charter, is an essential starting point for both the specialists that study and try to reconstruct heritage from scientific cues, and those people that 'live' heritage through performance. This is because some societies (especially in the Western world) see metric digital reproductions of heritage as a crucial baseline for the 'authentic' experience when accompanied by a transparent description of the data-making and interpretation processes.

This aspect is well expressed in Chapter 5 by Peter Jensen, where he emphasizes how meta- and paradata, as defined in the London Charter, support the transparency of the interpretation process. Archaeologists and heritage practitioners make assumptions about heritage that are based not only on the archaeological context, but also the currently available scientific methods and practice. Meta- and paradata show in a transparent way how interpretations and representations evolve over time, as new data and new knowledge become available.

### Object biographies

From the perspective of object biographies, the digital form of monuments and artefacts is simply another stage in their long life-span, which does not undermine the authenticity of these objects. As stated by Jody Joy and Mark Elliot in this volume (Chapter 1) and Jody Joy in previous works (2002), the copy simply emphasizes the spatiality and temporality of an object and implies a transferability of the aura (or part of it) from the original to the copy. This argument is also

followed by Nicola Amico et al. in Chapter 9. While Bruno Latour and Alan Lowe argue that the aura can 'migrate' from the original to its potentially infinite copies (Latour & Lowe 2011, 278), to them the central question about authenticity and aura is not 'is it an original or merely a copy?' but 'is it well or badly reproduced?', thus reconciling accuracy and transparency (i.e. the material perspective toward the replica), with aura and experience (i.e. the constructivist view). They go on to say:

[F]acsimiles, especially those relying on complex (digital) techniques, are the most fruitful way to explore the original and even to help re-define what originality actually is... To say that a work of art grows in originality thanks to the quality and abundance of its copies, is nothing odd: this is true of the trajectory of any set of interpretations. (Latour & Lowe 2011, 278–9).

From this perspective, the authenticity of an object is maintained thanks to this temporal and material fluidity. The continuous path through time and space of humanly made objects has been exhaustively studied by several scholars when trying to study 'things' through analysing their biographies (Holtorf 2002; Knappett 2002; Tringham 1994; Kopytoff 1986; Pred 1984). This concept of material fluidity needs to be reconsidered, however, in relation to the digital and the web, which favour an unprecedented dissemination of digital copies. We need to consider what happens to *the original* now that no great distinction can be made between the various digital copies that populate the World Wide Web, raising issues relating to distribution and copyright, authority and power. It is always more relevant in a web-connected world to keep track of the flow of the copies described by Latour and Lowe, and develop 'fluid' and 'transparent' biographies of 'things'.

### Authority and power

As expressed at the beginning of this paper, archaeologists and heritage and museum specialists have authority to manage the original object/cultural heritage. Archaeologists are the first people to experience the object during its discovery. After studying the object and giving their personal/subjective interpretation, they give back to the public an 'authentic' piece of their cultural past. From the moment of its discovery, a set of power relations characterizes the life of the object out of the ground and identifies 'those people who have the ability and authority to "speak" about or "for" heritage ... and those who do not' (Smith



2006, 12). As pointed out by Laurajane Smith in her book *The Uses of Heritage* (2006), archaeologists and conservation architects dominate the preservation and management of most heritage sites and places both on a practical level – since they have a significant presence in UNESCO and ICOMOS, government heritage bureaucracies and amenity societies – and on a philosophical level, due to ‘the ability of both disciplines to claim expert authority over material culture’ (Smith 2006, 26). Specialists decide how to manage and preserve the material heritage and its ‘physical’ authenticity.

When material heritage is taken inside a museum, new forms of authority and power come into play. Russo and Watkins (2007, 157) argue that in the modernist museum paradigm, the geographic address, with its defined real spaces, drew the visitors through its doors. These visitors engaged in an interaction with the artefact(s) and institution in a personal and physical way. Such engagement led to the definition of cultural experience, providing meaning through authenticity. The connection to reality, with its promise of authenticity, endowed the museum with authority. Physical boundaries, as well as hierarchies of practice, protected the territory the museum occupied and the social/cultural structures derived from this philosophy. This paradigm is still prominent in quite a few museums today, empowering curators and other museum specialists who become the authority entitled to handle the objects, reinforcing their status and right to touch. ‘In contrast, the public – those people who are not entitled to touch – have grubby hands that potentially render objects filthy’ (Candlin 2007, 95). In this way curators and museum specialists become the only intermediaries between the relics and the public, carrying ‘the sacred flame of the institution – the museum ... These same people question when anybody doubts the apostolic succession’ (Taverne, quoted in Gibbons 2001). 3D digital and especially printed replicas offer new possibilities for tactile (virtual touch in the case of 3D digital replicas) interaction with tangible heritage. By extending the number of people that are entitled to touch the object, these innovative technologies force us to reconsider the traditional concept of authenticity.

More broadly, we believe that 3D digital and printed replicas have the potential to challenge the AHD (Smith 2006), providing the possibility of extending the interaction and critical participation of non-expert users/the public in accessing and using heritage, an aspect which, according to Laurajane Smith, was absent in the AHD which established top-down relationships between expert, heritage site and ‘visitor’ (Smith 2006, 34). These new tools also favour the creation and diffusion of ‘subaltern’ discourses about the nature, meaning and use of heritage, characterized by the participation

of different communities in heritage management and conservation, as is well illustrated by both Stuart Jeffrey and Gareth Beale in Chapters 4 and 7.

### Experience and performance

Most of the scholars dealing with the concept of authenticity as applied to tourism and the public focus on the nature of engagement and experience with objects, rather than a quest for authenticity in the objects themselves. From this perspective, ‘authenticity’ is defined by the ‘experience’ (Wang 1999, 352). This view has followed the idea that tourism leads to commoditization, which many writers consider destroys the authenticity of heritage (Greenwood 1977; MacCannell 1973; Boorstin 1964); instead a surrogate ‘staged authenticity’ (MacCannell 1973, 597) or ‘pseudo event’ (Boorstin 1964) is sold to tourists as an original cultural product, to respond to their genuine desire for authentic experiences.

A more positive approach toward this idea of the ‘experience’ is based on the assumption that visiting heritage sites and museums is a performance. People (visitors, audiences, communities) interact with cultural heritage for a variety of reasons and in a variety of ways, and this consumption of identity and place is as valid as the performances of heritage that are historically legitimized. Silverman (2015) defines the contemporary process of heritage performance as ‘contemporary authenticity’ and states how this process ‘rather than being kitsch, inappropriately labelled post-modern, or demeaned as a simulacrum (as per Baudrillard) is a vital force driving much national and local culture and cultural entrepreneurship today.’ (Silverman 2015, 85).

Even though it is true that a fundamental aspect of authenticity in heritage is its problematic relationship to the global tourism economy (Silverman 2015, 79), and digital reconstructions are a part of it, the papers in this book demonstrate that studies on the authenticity of the ‘experience’ with heritage relate not only to tourism, but also the concepts of performance and authorship.

The first of these harks back to the idea of aura and suggests that the aura of heritage is not necessarily intrinsic to the objects themselves, but must be constituted in performance (Joy 2002). When the replicas allow performance with heritage, the aura of the original partly migrates and new meanings help to regenerate the original aura. In a 3D digitally reconstructed environment, performance and experience are achieved through ‘immersivity’ and ‘presence’. Embodiment is one of the key components of immersive systems which have been implemented

and used in heritage, based on the idea that both our experience and understanding of the past are mediated by our embodied experience with past remains (Dant 1999; Malafouris 2004). According to this idea, cognition depends on our bodily, sensory motor capacity to experience the material (Varela et al. 1991, 172–3). 3D immersive systems have therefore been designed following theories of embodiment (Forte 2014, 22; Camporesi & Kallmann 2013; Kenderdine et al. 2012; Galeazzi et al. 2010; Levy et al. 2010; Kenderdine et al. 2009; Forte 2008). Immersive systems allow for a sense of ‘presence’, as defined by Draper et al. (1998, 356): ‘a mental state in which a user feels physically present within the computer-mediated environment’; and by Dawson et al. (2011, 389) as involving ‘feelings of being transported to another place and time (“you are there”)’. This presence is defined as ‘physical’, ‘social’, and ‘cultural’ (see Pujol & Champion 2012 and Dawson et al. 2011, which also provide a definition of ‘presence’; see also Forte et al. 2006; Petridis et al. 2003; 2006; Di Blas et al. 2005).

The concept of authorship relates to the experience of making a digital object and also ties back to the concept of embodiment. Both Stuart Jeffrey and Kevin Garstki (Chapters 4 and 6) demonstrate how when a community select and digitally replicate heritage, the 3D digital replica is felt as more authentic. We believe that the process of reconstruction is a performance that enhances the migration of the aura through affective bodily interaction with an object. In fact, digital replication and reconstruction involves ‘body-based image schemas’ (Csordas 1994), that is the descriptions, metaphors and metonyms of the body that mediate between physicality and sociality, the material and the virtual, the real and the copy. These schemas mediate through the feelings involved in crafting a replica.

### Structure of the book

This interdisciplinary edited volume gathers together 18 researchers affiliated to various international universities and research centres working in the fields of Heritage, Digital Heritage, Museum Studies, Archaeology, Archaeological Science, and Digital Archaeology.

The book aims to contribute to an ongoing commitment of the European Union to explore the role of 3D technologies for enhancing European heritage-making processes and to promote both access and preservation of heritage. This has been reflected in the funding of several research projects on digital media and 3D technologies, including the Marie Curie Intra-European Projects of two of the three editors of this volume. These projects have funded the publication

of this volume. We believe that this monograph will generate great interest in the international academic community, providing a key reference text for all readers interested in authenticity, in particular cultural heritage and 3D reproductions.

The chapters cover a variety of themes in a logical sequence from the history of replicas (e.g. museum casts and architectonic replicas) to cases studies showing the multiple applications of digital replicas in archaeology and the heritage field. The book is divided in four parts:

#### *Part 1. Histories*

Here readers can explore the fascinating stories behind the predecessors of digital replicas: museum casts and architectonic replicas.

In Chapter 1 Jody Joy and Mark Elliot tackle the issue of the ‘real replica’. These are the casts stored in museums: on the one hand they are considered not valuable because they are not ‘authentic’ or genuine objects from the past; on the other hand they are charming vintage reproductions of the past which can be contrasted with the modern replicas created using modern digital techniques. According to the authors, replicas can also be a valuable source of information for authentic objects that may now be lost, damaged or transformed. In a sense, these copies bring along their own biographies – their context of creation and use – and therefore can be studied as such. Joy and Elliot examine the use of replicas in museums and, among other purposes, their role as a teaching aid before the advent of digital technologies. The authors focus on a specific case study: the so-called ‘Maudslay Casts’, a group of plaster casts of Classical Maya monuments at the Museum of Archaeology and Anthropology (MAA), University of Cambridge. Through this case study the two scholars show changing attitudes towards replicas over time, and ask what will be the role of such casts in the digital era.

In Chapter 2, Lola Vico Lopez compares the axioms *authenticity/realism* with *virtual/real reconstructions*. The author argues that although principles and criteria for evaluating the quality of projects in terms of historical rigor and scientific transparency have been developed (e.g. the London and Sevilla charters), these are intended as general guidelines and not as prescriptive rules or standards, in contrast to architectural restoration, which is considered a well-defined science. Vico Lopez wishes to ‘demonstrate that virtual reconstructions share a part of the theoretical framework of the architectural reconstructions’, based on authenticity and scientific transparency objectives, and therefore one can attempt to build a theoretical framework for virtual reconstructions. More specifically, she aims to



discuss critically the contraposition between real and virtual reconstructions, applying the rules of the most famous restoration charters to virtual reconstructions. Consideration is given to a review of terminology, considered an important factor in any discussion on authenticity applied to the architectonic restoration domain and now expanded to the virtual one. In this vein, an architectonic method for virtual reconstruction is applied to some case studies, together with a series of principles for identifying architectural authenticity in 3D digital modelling.

### *Part 2. Definitions*

This part considers two apparently opposite definitions of authenticity in relation to digital replicas: the first (Chapter 3) is object-centred; the second (Chapter 4) is community-centred. As discussed above and shown later in the book, these definitions can be reconciled through practice and use.

In Chapter 3 Sorin Hermon and Franco Nicolucci discuss the London Charter, a document they wrote almost a decade ago, together with other scholars, which defines a set of principles to ensure methodological rigour for the use of computer-based visualization methods. They consider its outcomes for the research and communication of Cultural Heritage, and to what extent the Charter is still relevant. It defines authenticity from a materialist perspective, claiming a need for solid principles that justify the choices made by computer specialists who create digital replicas of cultural heritage. These principles allow for ‘intellectual transparency’ (Beacham et al. 2006), i.e. recognizing the replicas as the product of a scientific process. Liability and reproducibility are two basic requirements in any discipline, and they become even more meaningful in the digital frame. The London Charter principles help to address these issues in the scientific process and guarantee that the authenticity of a digital visualization outcome is expressed at its best.

Through the case study of the church of the Christ Antiphonitis (Cyprus), the authors outline the principles of the London Charter and how they were addressed for evaluating the ‘authenticity’ (for the authors, ‘intellectual accountability and data transparency’) in the digital (2D and 3D) visualization research project.

In Chapter 4 Stuart Jeffrey argues how the shift from analogue representations of the past to digital representations brings new challenges and resurrects the issue of the auratic quality of new technologies, as discussed in Benjamin’s seminal essay on the aura in the age of mechanical reproduction (1968). Jeffrey provides a fascinating definition of authenticity, which is influenced by issues of authorship and ownership

as well as technical matters affecting the longevity of digital data. Authorship (who created the record or representation) and ownership (who legally controls the object) are often controlled by organizations and institutions and the names of the individuals responsible are relegated to contextual information or metadata, or are entirely absent, illustrating the power relationships that exist between the actual data creators and their host organizations. Jeffrey argues for the active participation of the creator, stating that the digital record is not the result of an entirely objective and/or automated process in which the creator is essentially a machine operator. At the same time, the possibility to own a version of a cultural object or work of art is one of the easiest ways to feel closer to its creator. Jeffrey describes how in the domain of digital heritage objects, the ‘status of ownership is already linked to authenticity as this is often considered as being constituted in part through regimes of value associated with authorizing institutions’, but also proposes an emerging alternative approach that sees digital heritage objects produced for a specific audience (or better, co-produced with them), free to use and re-use for any purpose, clearly creative, explicitly authored, and reliably and permanently accessible.

### *Part 3. Practices*

Here various issues relating to process and practice and how they might impact the use of replicas in archaeology and the heritage sector are explored.

In Chapter 5 Peter Jensen aims to answer important research questions regarding authenticity and practices of 3D documentation during archaeological fieldwork. As stated by the author, the use of the term authenticity when referring to archaeological documentation ‘at first glance appears somewhat ambiguous’. This is because the concept has mainly been associated with the analysis of objects, replicas, and reconstructions/simulations of sites and monuments. Using as case studies excavations at three archaeological sites in Denmark – Skelhøj, Jelling and Alken Enge – Jensen clarifies how ‘authenticity of the documentation has nothing to do with what is original, but simply how what we have now, the visual representation, relates to what was in the past; knowing that everything is derived.’ He describes the para- and metadata contained in the documentation as crucial elements for the creation of open and dynamic interpretations. He is confident that this kind of transparent approach can be crucial in answering specific questions on the documentation and interpretation process: ‘How certain am I?’ and ‘How well does this/my documentation reflect reality?’, concluding that the inclusion of all available data and embedded semantic information

would enable the authenticity of 3D fieldwork data to be evaluated.

In Chapter 6 Kevin Garstki demonstrates how the authenticity of a 3D digital representation of an artefact relates to ‘the full production process – all of the choices, inputs, and data manipulation that affect the final model.’ He outlines the similar trajectories of photographic technology and 3D scanning technology applied to archaeological practices and argues that these cannot be considered as completely mechanical processes. The operator has a significant influence, also defined as ‘technological authority’, over the final product and this should be interrogated and revealed, aiming for transparency in the replication process. In the conclusions to his chapter, Garstki argues that the creation of any visual representation in archaeology (photograph or 3D model) is an attempt to convey visual data to another person who may not have access to the original. For this reason, to increase the accuracy of the visual data and ‘avoid the assumptions of objectivity that often accompany the attribution of technological authority, we need to be as explicit as we can in how we produce these digital representations – from the decision of what 3D scanning technology to utilize to the edits we make of the final product.’

In Chapter 7 Gareth Beale discusses whether the concepts of authenticity, developed from the use of computer graphics in archaeology, are adequate when we try to describe and understand the role of digital image-making in an era of plurality, numerous methodologies, and different power relations. He discusses various uses of image-making within archaeological practice, considering the processes through which it is possible to negotiate new forms of authenticity. Three case studies are presented – the Basing House project, the Mesolithic microlith from Thorncombe Beacon, and the *Re-reading the British Memorial* project – through which the author describes different archaeological research models, such as interdisciplinary collaborations, community archaeology projects and public art projects. The author examines ‘the different ways in which authenticity is created and maintained within archaeological representations’, always emphasizing that in each example ‘authenticity cannot be said to reside in the image itself but in the interplay between image maker, image and audience’. These chapters provide a link between the practice of creating replicas and their use, which is explored in the final part of the book.

#### *Part 4. Uses*

This part provides an overview of how digital replicas can be used for various purposes: knowledge production and research (Chapter 8), display and public

engagement with archaeology (Chapters 9 & 10), and contemporary art practice using archaeological sites (Chapter 10).

In Chapter 8, Eleni Bozia discusses how in the work of archaeological epigraphists it is essential to find verifiable ways to determine the authenticity of historical artefacts. The author presents the study of *ektypa* (epigraphies’ squeezes) and argues that ‘their existence and usage as mediums of research redefine the traditional appreciations of authenticity’. Bozia also attempts to address the degree of authenticity *ektypa* afford, asking: ‘Can an ektypon rival the original inscription?’, and ‘Does the 3D model of the ektypon bring us closer to the real artefact, or [does] it simply fake reality?’ Taking into consideration the NARA (1994) document, particularly to explain traditional concepts of authenticity and how they affect the research point of view, she frames the question of authenticity in the literary and archaeological fields from two angles: on the one hand the nominal and expressive meaning of authenticity (Dutton 2003), and on the other hand the authenticity of experience (Phillips 1997). The author focuses on the *ektypa* through the application of the *Digital Epigraphy and Archaeology Project*, an online database for the digital preservation and analysis of the squeezes’ 3D models, providing also a discussion regarding the levels of authenticity and reality(ies) of an artefact. She argues, moreover, that the nature of an artefact (and consequently its authenticity) is based on the way it is used which therefore presupposes different levels of authenticity (and non-authenticity).

In Chapter 9 Nicola Amico et al. discuss 3D digital replication with a particular focus on 3D printing and the creation of 3D physical replicas of museum artefacts. Through the case study of the so-called Kazaphani boat, a Cypriot Late Bronze Age pottery artefact in the shape of a boat, the authors emphasize the importance of 3D prints for the circulation and exhibition of fragile artefacts. Using this case study, the authors also try to redefine authenticity based on the public’s experience with the 3D printed replica. The concept of authenticity is set within recent debates on the authenticity of 3D digital and physical reproductions of cultural heritage, with the focus on the specific concepts outlined by the World Heritage Operational Guidelines (UNESCO 2015): *truthfulness*, *credibility*, and *integrity*. In particular, the authors address the concepts of *integrity* and *transparency* in relation to the 3D digital and physical replication process, as these ensure the authenticity of the replica. Describing all the steps involved in the creation of the 3D digital and printed models of the Kazaphani boat, the authors trace the new identity of this object (i.e. its ‘new aura’

and ‘augmented authenticity’), which is also defined by the perception and perspective of the observer (i.e. museum visitor). Notably, the authors consider the museum visitor’s experience from the point of view of the curators; they discuss how the curators chose to display the replica and how the display might be considered a guarantee of authenticity.

In Chapter 10, Frederick Baker uses the myth of Prometheus by Goethe, where the Titan dreams of making static human figures rise from the rock and come to life, as a parallel for the digital revolution and the creation of 360 Virtual Reality: the Digital Archaeologist is compared to a modern Prometheus. Through the case study of a virtual reality movie about the Copper and Iron Age rock art from Valcamonica, Baker explains how the story can be told in an ‘authentic manner, that satisfies both academic and entertainment criteria’. Baker argues that different claims ‘for the authenticity of digitally captured archaeological artefacts requires a nuanced approach and must start with the nature of digital archaeology itself’. The author starts therefore with the terminology, arguing between digital and virtual archaeology, adducing a different influence to the question of authenticity accordingly. In fact, the term virtual presupposes a dichotomy between virtual and real archaeology. The choice is for the term digital, where the digital visualization makes additions to fragmentary material and requires an interdisciplinary approach. Questioning ‘How far should authenticity go, in a digital world where almost everything is technically possible?’, Baker states there are two concepts of authenticity regarding the portrayal of the past: naturalism and alienation, which in virtual reality can work together.

This anthology gathers in one place the issues pertinent to scholars involved in the study and definition of authenticity for replicas of cultural heritage. As outlined above, the volume offers a variety of perspectives that reflect the multi-disciplinary nature of the topic. We believe that each chapter will contribute to more general debates on the concept of authenticity and will influence future studies on the topic. We greatly appreciate the efforts of our contributors to articulate theories, as we believe that the practice of digital heritage and archaeology is still in need of a solid theoretical background.

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