

## Original Study

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# Challenging Heritage Visualisation: Beauty, Aura and Democratisation

**Abstract:** In this paper I will pose a challenge to digital heritage visualisation that takes as its starting point the weirdness of the digital world in comparison to everyday experience. Related to this is the apparent inability for digital objects to benefit from or acquire aura from their originals. I contend that, unless mitigated, these properties will cause a continuing lack of engagement with digital heritage visualisation beyond the professional and academic circles in which they are created. Contrary to expectations, I will argue digital objects can indeed manifest an auratic quality and that this is in fact fundamental to how they are received by various audiences. I contend that both aura and the intimate relationship between digital representation, aesthetics and the creative imagination need to be understood and embraced in practice. Finally, I will suggest some ways of addressing the challenge by looking at modes of co-production, physical replication and aesthetic quality.

**Keywords:** visualisation; digital heritage; aura; aesthetics; replication

DOI 10.1515/opar-2015-0008

Received December 4, 2014; accepted April 17, 2015

## 1 The Challenge

Over the last two decades, digital visualisation methodologies have become firmly embedded in the canon of archaeological practice. Archaeologists and heritage managers have drawn on a range of recording technologies to generate highly accurate datasets of historic objects, monuments and landscapes. They have also increasingly drawn on the rich functionality of 3D modelling packages to create visualisations and reconstructions of the past. 3D datasets, and the visualisations generated from them, are used in site recording, site management, structural analysis, archaeological interpretation and hypothesis testing, and increasingly, as a dissemination mode for broader audiences. In this paper I will focus on the challenge we face in using heritage visualisation to help us think anew about the past itself, rather than strictly in relation to their function as digital documents of real world heritage objects, structures and landscapes.

In the digital domain long-standing issues of data integration, discovery and long-term preservation have now begun to be tackled in a meaningful way. Engagement with multiple audiences through digital visualisation is possible and, if good practice is followed, the visualisations are discoverable, referenceable (e.g. via DOI), contextualised and permanently available. This should herald a Golden Age in heritage visualisations. However, there is a danger that the quest for new technological approaches, precision, accuracy and apparent realism becomes an end in itself, following a path that Huggett has referred to as technological fetishism [1]. In this paper, I will argue that there remain significant challenges that need to be addressed if we are to capitalise on this potential Golden Age.

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**Article note:** This article is a part of Topical Issue on Challenging Digital Archaeology.

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These challenges are exemplified by the fact that there is little broad community engagement with digital visualisation, despite community interest in the technologies themselves [2]. Expert forms of knowledge and/or professional priorities invariably inform digital visualisations, consequently, the resulting digital objects fail to engage broader communities as a means of researching and representing the heritage. The low levels of public use and re-use of these resources also suggests concerns relating to perceptions of authenticity, aesthetic appreciation and value.

I will argue that the 'aura' of the digital object is fundamental to how it is received by its audiences. We need to understand and embrace the potential for digital objects to manifest, or accrue, auratic qualities. I suggest these qualities are intimately related to modes of production, aesthetics, and creative imagination. In what follows I will explore what I hope are fruitful avenues for addressing these challenges. Firstly though, it is important to acknowledge the 'weirdness' of the digital realm, this is a realm which is inherently otherworldly and strange in comparison with the rest of human experience. This weirdness, unless mitigated, tends to produce sanitised and alienating representations, which many audiences find difficult to engage with, let alone to use and re-use.

## 2 Weirder than the Past

Our internal construction of the past comprises what we think we know, what we know is unknown and of course the famous 'unknown unknowns'. Thus any reflection on the distant past and how it was experienced conjures up a catalogue of uncertainties. Concepts fundamental to a modern western way of being; politics, family, gender, personhood, divinity, to name but a few, were all demonstrably fluid historically and are assumed to have been equally fluid in prehistory (e.g. see [3]). The differences between our ancestors and ourselves are in many ways so profound that even some magical form of direct contact would likely only move us a small step closer to truly understanding them. The past should, and does, appear to us as a very weird place, a place where what we assume to be certainties are constantly challenged, although it is also 'domesticated' and reproduced in the image of the present [3, 4]. The challenge offered by the past is of course a large part of the pleasure in studying it. Weird though the past may be, I would argue that, for many people, the digital world, specifically the world of modelled digital objects, carries with it a similar degree of weirdness. Bearing in mind that one of the ultimate objectives of digital visualisations is to help us understand the past, not only is it a peculiarly modern medium, but conceptually it represents a huge break from all previous ways of interacting with the world. The leap from analogue to digital represents both a more rapid and larger step change in the technology of representation than virtually any that have gone before. In this I would include the invention of photography, cinema, radio and television (all of which have now been near universally subsumed into the digital world). A key component in understanding the scale of this difference lies in the immateriality of the digital object itself. The objects we use for delivery; internet infrastructure, computers and mobile devices are at least physical things, but the digital object itself is fundamentally immaterial and this raises significant issues.

The strangeness of the digital object as a record becomes clear in comparison to real world objects (and the physical analogue records that might have been created to describe them). Traditional records and representations of an archaeological monument, say of a carved stone cross, would likely consist of documentary records, photographs, measurements and, going back in time, even casts or rubbings. These may be collated, edited and published or gathered together and placed in a document archive or finds store. Where these records are located, and how they can be accessed, should in theory never be in doubt. At the very least we know that the records exist somewhere and if we had the will we could get to them, pick them up, read them and analyse them. Compare this to the nature of a digital model of the same monument. If we look at some of the actual properties of the digital world, a number of previously unheard of features emerge:

- *No substance* – barring the nascent field of haptics which offers a peculiar analogue for the sense of touch, the object has no physical substance that we can sense, no weight, no texture, no smell and no temperature.

- *No location* – it is not clear to us what physical space the object actually occupies, this is especially true when they are dormant, i.e. not being actively viewed or interacted with. Until fairly recently it might have been possible to think of them as existing on a hard drive or a removable disc, but where is ‘the network’? Where is ‘the cloud’? Where is the internet? These locations are a separate class of locations that share little with the notions of physical space that we are most used to dealing with.
- *No degradation* – All physical things decay, and this is an important element of our understanding of them. Much of archaeological practice involves trying to categorise and quantify processes of decay. The digital object apparently lies outside this universal physical process.
- *Infinitely reproducible* – the reproducibility of a physical object is contingent on material, there is a cost in reproducing it and that cost is part of the intrinsic physical nature of the object. Again, this apparently does not apply in the digital realm where infinite, perfect, cost free copies of an object can be created.
- *Ownership vs licensing* – ownership of all kinds of digital content appears to be a dying concept. Digital music, film, books and much else is unlikely to be owned in a real sense by the consumer. Instead the relationship becomes one negotiated by licensing arrangements. We buy a licence to consume a digital version of a book on an eReader, we don’t own the book. Almost all digital heritage objects fall into this category. This has a profound effect on the relationship between the audience and the object, particularly in terms of re-use. There is also a relationship here between ownership, location and access. Where objects are poorly curated the sense of a lack of location is compounded by the apparent transience of links to the object (e.g. URLs), engagement with an object is discouraged in an environment where long-term access is beyond one’s control and is unpredictable and capricious.

I am acutely aware that, in terms of both electronics and physics, digital objects are being somewhat misrepresented here, as ultimately they do have a form of physical existence perhaps encoded on magnetic media, in solid state devices, or as dynamic charge states in RAM. I have also myself written on the types of loss and decay that digital content suffers in reality, including software redundancy (e.g. [5]). However, the vast majority of users rarely consider these realities (or find them difficult to conceptualise) and nor should we expect them to. It is the properties as they actually appear to users that should matter to us when considering them as media for visualisation and modes of dissemination.

We see then that for a non-computer science specialist the digital object has no substance, it exists nowhere, it can be infinitely copied, there is no cost in its replication, it never degrades and, most likely it can never be owned, only consumed under license. How does this strange nature impact on the user? I would contend that these factors combine to create an apparently sanitised, distancing and disengaging artefact, and one that, for a certain conception of authenticity, would be the antithesis of an authentic object. Whilst the last few decades have seen critiques of the notion of authenticity, or at least its reconceptualisation as a cultural construct, in heritage contexts it is still assumed to be intimately tied to the physical historic object [4,6,7,8]. Linked as it is to historic fabric, setting, and use, and more experientially, processes of aging, patina and decay, it is hard to see how the digital reproduction could acquire authenticity. Thus, the issue of authenticity lies at the heart of the problem and, via its strange immateriality, digital representation faces challenges even beyond those faced by mechanical reproduction as a transformative technology. The elimination of the authenticity, or what Benjamin [9] calls ‘aura’, might at first glance suggest that digital visualisations will never operate in the way that an original authentic object or work of art might do. But what if it was possible to imbue the digital with its own aura?

### 3 The Digital Aura

Translations of existing artefacts, sites or monuments into the realm of the digital, and even born digital reconstructions, can be thought of as a form of reproduction and the problematic nature of reproductions as a medium for engagement with the original has long been recognised. The seminal statement on this by Walter Benjamin draws on the key issue of authenticity, he describes the problem this way:

*“The authenticity of a thing is the essence of all that is transmissible from its beginning, ranging from its substantive duration to its testimony to the history which it has experienced. Since the historical testimony rests on the authenticity, the former, too, is jeopardized by reproduction when substantive duration ceases to matter. And what is really jeopardized when the historical testimony is affected is the authority of the object.*

*One might subsume the eliminated element in the term “aura” and go on to say: that which withers in the age of mechanical reproduction is the aura of the work of art” [9]*

Even with Benjamin’s definition, the aura seems to me a difficult concept to pin down precisely, although most people will admit, at least to themselves, that when faced with an object rich in history and meaning that they experience something beyond intellectual stimulation. For me, it is this extra, but ineffable, sensation that actually catalysed my desire to engage with the process of archaeology in the first place. A key aspect of the aura is that sensation of being close to the past. This sensation, the thrill of proximity, is not essentially about the physical object itself, it is about the people who have been close to it in the past and our connection to them. For example, an ancient crown is only an important object because of the heads that it has sat upon or which were associated with it, and the the hands of the people who crafted it. Without these connections, it is only an interesting piece of metal. To excavate such an object, and to be the first person to hold it in ones hands for a long time, is often acknowledged to be a thrill, and a key part of that thrill springs from that sense of proximity to people in the past that the object allows us to experience [7,10].

Each object, monument or place has a biographical chain of events that leads back from the present to its creation and each link in the chain is redolent of the people who handled the object, used the monument, or occupied the space. Our direct personal experience of the object, monument or place, is simply the latest link in the chain and somehow connects us to every other person on the same chain however distant they are in the past. For real world objects, such as the ancient crown, or monuments, such as a stone circle, the biography and the chain of events emerging from the past into the present can be seen to have a clear expression in our notions of its authenticity and the aura surrounding it. As described here, this chain can extend into the deep past linking us with known or unknown individuals but it can also operate in the recent past. An example of this is the peculiar value that is assigned to lower numbers in limited editions of, for example, photographic prints. Print 1/1000 is more valuable than print 463/1000. Such prints may even be sold at the same initial price, and the change in value will emerge at re-sale. The same can be said of the editions of books or prints of an artwork. Why is this? For photography somehow the closeness to the original negative (in terms of the sequence of prints), brings the buyer closer to the photographer, and possibly therefore closer to the photographer’s subject. With chemical print technology the chain is decidedly a physical one and it might be possible to argue that each subsequent print is slightly less ‘true’ than the previous one through the action of some infinitesimal physical process. This again raises the question of authenticity, and particularly aura, in relation to digital records and recreations. It is the translation of the record of the object from the analogue to the digital, with all the changes in material quality that this entails, that has the biggest impact on the aura. In effect, the weirdness of the digital medium somehow breaks the chain of proximity. The digital representation is no longer part of the same chain as a chemical photograph or sketch drawing might be. It has been sanitised and its intangibility, its infinite reproducibility and it’s imperviousness to the ravages of time all conspire to eliminate the aura.

In 2011 Bruno Latour and Adam Lowe published a paper called *The migration of the aura or how to explore the original through its facsimiles* [11], which responds directly to Walter Benjamin’s 1937 paper *The Aura in the Age of Mechanical Reproduction* [9]. In this paper, Latour and Lowe make a number of important points about the concept of the aura with regards to replicas and reproductions of works of art. The most important of these arguments in relation to this paper is their belief that, contrary to Benjamin’s position, some part of the aura of an original object can indeed migrate to its replicas, as opposed to the replicas simply accruing their own aura through time. This is dependent on a number of factors relating to the quality of the replicas production such as expertise, intentionality and the expenditure of resources. For Latour and Lowe the complex digital techniques required to create a physical facsimile are an intermediate

phase of the replication process and the aura migrates to the final replica. While the concept of aura in the digital realm has been previously recognised, the focus has been on a general crisis of the aura or the accrual over time of a new form of aura [12, 13]. I would contend that Latour and Lowe's argument regarding physical replicas or reproductions can also be applied to digital replicas and reproductions i.e. the digital representations that we now use daily in archaeological practice. As discussed above the digital replica is clearly a different from the physical, however they are still produced subject to the already noted factors of expertise, intentionality and the expenditure of resources and these may act on the digital in the same way as they act on the physical. I would like to argue that aura can migrate from an original to its reproductions, in our case a digital visualisation of a real world heritage site or monument or a virtual reproduction of some scene from the past. These representations can add to or change the aura or authenticity of the original, becoming part of the ongoing biography of the original in the process. However, some forms of reproduction/representation will still facilitate this more than others. Ultimately Latour and Lowe argue that this depends to some extent on how good or bad a reproduction is, their evaluation of this seems in part to come down to technological sophistication as well as value and intentionality, but what does it mean for a digital visualisation to be a good or bad reproduction?

In the following three short sections I will not dare to try and define what is a good or bad visualisation, but I will discuss what I think are means by which the issue of the digital aura can be addressed. These are community co-production, 3D printing as a mode of co-production and the recognition of the value of creativity in visualisations, both by their creators and in collaboration with creative practitioners. Each of these approaches offers a means by which the tyranny of a purely technical engagement with digital objects can be meaningfully challenged.

## 4 Democratisation and Co-production

It is argued above that replicas and reproductions, including digital representations of original historic objects and monuments can acquire authenticity, but that this is dependent on their means of production in terms of intentionality, value and quality. Other research around physical replicas and reconstructions suggests that networks of relations created through community ownership, design, and/or participation are important in the creation of value and the experience of authenticity [7, 14]. If 3D models produced by 'experts' can seem disconnected, clinical, and irrelevant to the communities of interest that accrue around heritage places, the response should be to find ways to facilitate broader engagement with the production process and to evaluate what these audiences actually want.

As Benjamin argued in his 1936[9] article, mechanical reproduction (comparing theatre to cinema) is both liberating and problematic. Developments in new recording technology combined with the growing affordability of some existing technologies means there are increasingly low technical and financial barriers to production of three dimensional datasets and their subsequent visualisation. The potential for mass engagement with the production of 3D records and visualisations is very real. In response experts have sought to engage in training exercises to democratise the recording and modelling process (for UK examples see [15,16]), but this still maintains a form of authority, especially with regards to the selection of the types and nature of the heritage deemed appropriate for recording and modelling. Co-production, which implies working together, rather than directing community work, can potentially create the kinds of networks of relationships around the production of the digital objects that would facilitate the migration of, or creation of the aura.

The ACCORD project (Archaeological Community Co-Production of Research Resources) [15] is a direct attempt to investigate this aspect of co-design and co-production (for another recent example of co-production see Micropasts 2014[18]) and specifically to examine if, when and how authenticity and value is produced. Work has taken place with ten community groups across Scotland using low cost or free software (often highly sophisticated, but easy to use) and consumer grade hardware to co-create 3D models using photogrammetry. Models are created in tandem with statements of contemporary social value. Focus groups are also carried out with each group in order to capture their responses to the co-produced

digital object(s). Analysis of the results of this work is ongoing, but it is already clear that this approach creates records that are valued very differently from those generated solely by professional and academic practitioners. Whether the sense that a digital object is more valued when created through co-production extends beyond its immediate creators, to more distanced viewers, or to viewers in the future or not, has yet to be demonstrated. However, it is demonstrable from ACCORD work how powerful the process of creating a digital record or replica is as a way for communities to validate, or enhance, the significance of the original site or object.

## 5 Closing the Analogue-Digital-Analogue Circle

Perhaps the most direct way that the weirdness of the digital will be mitigated in future is by allowing the digital object to break back out into the real world. This of course is exactly what has been happening with the widespread adoption of low cost 3D printing (additive manufacture). The challenges and opportunities that this technique raises for archaeology are discussed in depth elsewhere in this journal [19], however one aspect of the process is particularly pertinent with regard to digital aura.

The analogue-digital-analogue cycle creates a new moment of production, which again has the potential to activate processes that facilitate a migration of aura. If the users are themselves producing the print, for example by downloading a file from an online archive (e.g. the Smithsonian X3d, currently in Beta testing [20]), then they are in fact engaging in a co-production process. The final object is essentially a collaborative work between themselves and the creators of the purely digital version. They have entered into a relationship with the source of the digital object involving production rather than simply consumption.

Home or school production of a print also counters one of the key oddities of the digital world, the physical output not only has substance (however strange) and location, but also has the ability to be owned. Ownership consequently allows specific types of reuse that might not be allowed under license. The physical version can be used in any way the owner wishes, coloured, reshaped, sculpted or integrated with other objects. This type of reuse clearly creates a new representation of both the digital object and the original real world object (if there is one), but, does not fit exactly into the realm of reproduction discussed by Latour & Lowe. For them, the aura of the reproduction is contingent on the quality of the reproduction, determined by, amongst other things, its value, technical sophistication and level of expertise deployed [11]. Cheap additive manufacturing technology hardly fits these criteria. However, I would argue that creating a physical object from the digital would fit into a framework that sees aura as a function of both the intentionality of the replica and network of relationships around the process of production.

## 6 Beautiful by Accident

I personally find many visualisations of 3D archaeological data quite beautiful. There is an irony though, as despite the striving for realism apparent in many visualisations, the examples that are most attractive to me are often those that are least realistic. False colour, dense point clouds, cut planes through structures giving impossible views and especially representations where details and shapes have to be mentally reconstructed from the fragments represented - all these have their own particular beauty. The appealing, abstract qualities of these visualisations seem to be largely accidental, or at least incidental, and this both misses an opportunity and does an injustice to the creative imagination of the visualisation's creators. Digital representations of the past continue to struggle to overcome the perception that they are either purely scientific tools for analysis and management or flashy and unnecessary demonstrations of technological prowess offering no real insight into or connection with the past. This is a perception which, I would argue, many digital heritage practitioners are complicit in perpetuating. They value the scientific and technical nature of the production process and impress these aspects of the production on the aesthetic of the final product.

Whilst there have been numerous efforts by archaeological practitioners to overcome the questions of interpretation and emotional engagement through collaboration with artists (for recent examples and

discussion see Russell and Cochrane 2014[21]), this has so far been much less apparent in the field of digital archaeology (for a notable exception see Watterson [22]). As academic representations of the past are still struggling to achieve the levels of realism that one might experience in the cinematic context, there is some sense that we should revert to the technique of facilitating the ‘suspension of disbelief’ that has occurred through the ages, but which depends on a strong narrative. Simply put, if the narrative engages an audience strongly enough then the deficiencies of the stage set, the cinema special effects or the unrealism of a visualisations rendering do not matter.

In archaeological heritage, rather than a straight dramatic narrative there has been some focus on the potential for gamification, basically an interactive narrative (not just via the use of games engines e.g. Rua and Alvito [23]), to provide this engagement and allow audiences to feel immersed in the past (for an example see the VMUST Keys to Rome project 2014 [24]). I suggest that this is a problematic approach for a number of reasons, not least the necessity of disambiguating multiple interpretations of the past in order to construct meaningful game objectives. However, I would also argue that we could borrow from the strong aesthetic element of computer games. For the time being many efforts to make virtual representations realistic still produce a weird, almost sinister, aesthetic. However, if the struggle for realism is tempered with creative responses to the past we can create a deeper engagement than a photorealistic image itself might do. It is our natural curiosity towards the artist’s intention that acts as a lever to draw people into a visualisation or representation of the past. It is also the clear, but implicit, understanding between the artist and the audience that there is no single correct interpretation of their work that liberates the visualisation from the constraints imposed by clashing archaeological interpretations of the evidence on which the representation is based.

Given the power of the visualisation tools that we use, why do we so often abandon beautiful things in favour of an anti-aesthetic that privileges the scientific and technical nature of the process? The challenge here is to find ways of collaborating meaningfully with artists, creative practitioners and the creative public, as well as acknowledging our own creativity as digital craftspeople. An important element of this approach is its ability to mitigate against the tendency towards a data-centric view of the world. The data-centric view favours the collection and collation of data that fits with the pre-existing technology. In the case of digital visualisation it is the geometric representation of the external surfaces of structure that best fit the approach. There is of course much more to a site, monument and object than this, past and present stories, sensations, memories and ideas. We experience a world deeply coloured by these intangibles, as it was in the past. However, we often represent the past simply as the physical framework in which reality was experienced, but the framework is apparently empty of the things that actually constituted that reality. I would argue that our visualisations should be trying to represent this richness, both as it might have been experienced in the past and how it is experienced in the present. I would favour the visualisation equivalent of the sensuous and reflexive GIS argued for by Gillings and Goodrick [25] almost 20 years ago.

By adopting these strategies we should be able to demonstrate that our digital records, models and visualisations have acquired an aura of their own, or benefitted from migration of the aura from their original subject, and that they have been imbued with a deliberate and meaningful aesthetic that has an appeal beyond the present age. In one or two hundred years’ time will our visualisations be well considered enough to stand on their own as objects of intellectual fascination and aesthetic value? Will there be exhibitions of early 21<sup>st</sup> century archaeological visualisations in the way that the diaries and sketches of antiquarians or ancient maps are displayed today? I hope so.

## 7 Conclusion

The challenge posed here clearly does not highlight a general existential crisis for 3D recording and visualisation in archaeology and heritage. There is absolutely no question that the utility of these techniques in terms of metric recording, analysis, site management, disaster planning and a whole range of other important roles will mean that they will continue and grow in usage. However, I firmly believe that digital visualisations of the past, be they of sites, monuments, landscapes or populated worlds have an unfulfilled

potential to consistently and meaningfully engage broad audiences. They can facilitate an individual's or community's own intellectual exploration of the past and perhaps most importantly to provide them with that elusive thrill of proximity to that past. If we do not consider how digital representations actually feel to access, to use and re-use and, significantly, how they make one feel connected to the past emotionally as well as intellectually (i.e. their auratic quality), then digital visualisations will continue to exist as remote, disconnected and sanitised entities trying to express a vision of the past that was highly inter-connected and profoundly personal. They will remain a tool for the professional and the academic in their intellectual pursuits, but they will miss the opportunity to act as a powerful mode of collaboration, facilitation and emotional inspiration that I believe broader audiences would welcome.

Digital visualisations, either of existing or re-imagined heritage, are not simply a technical exercise, they act as powerful expressions of our present world view, and if not considered in this light, they fall short as meaningful representations of the past. Digital visualisation lies on a continuum of representations that begins with the first cave paintings. The meaning and power of each mode of representation between then and now should be used to inform us how best to utilise the technology at our disposal and to enable everybody to share their thoughts and feelings about the world as it was. In my view, the initial response to this challenge should employ co-production of the digital object and/or of a physical version of it and at the same time wholeheartedly acknowledge and embrace the creative and craft elements of digital visualisation production. These approaches, if successful may have a profound effect on the relationship between heritage professionals, the broader community and our engagement with the past.

**Acknowledgements.** I would like to thank Sian Jones for her input regarding issues of authenticity and her comments on drafts of this paper. I would also thank Sally Foster, Paul Reilly, Mhairi Maxwell and Emily Hamilton, as well as the reviewers, for their helpful and constructive suggestions.

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