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Digital 3D models of heritage artefacts: Towards a digital dream space



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ABSTRACT

This paper explores the use of digital 3D models of museum artefacts in a creative context. It investigates how creative engagement with digital 3D models of heritage artefacts can stimulate learning and foster new forms of engagement with digital heritage artefacts. This paper is illustrated with examples of creative works from a case study undertaken in collaboration with the National Museum Cardiff.

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1. Institutional practice

Digital media are increasingly incorporated in museum exhibitions (Lovejoy, 2004) and an increasing number of museums and other heritage institutions are now undertaking 3D digitisation of their collections. Digitisation is used to support museums' core duties of collection, preservation and display; 'the collection and creation of digital objects is seldom a goal in its own right, but rather a consequence of other institutional activity' (Newell et al., 2012: 291). Digital 3D models of heritage artefacts are used in a continuation of the traditional activities, which scholars and professionals in cultural heritage institutions have been pursuing for centuries; to document museum artefacts, heritage sites and archaeological finds, to study heritage materials without the need for physical access, to simulate real-world scenarios and to test restoration and hypothetical reconstructions. Furthermore, digital reconstruction from photographic data can 'restore' lost heritage; the Buddhas of Bamiyan, for example, were digitally reconstructed from photographic images by a team of researchers from the Swiss Federal Institute of Technology, following their destruction in 2009 (Gruen et al., 2004). Whereas museum artefacts are perceived as a part of the past, 'digital historical objects are usually conceived as tools for understanding the past' (Newell et al., 2012: 291). Within the context of documentation and restoration, it is of key importance that digital 3D models are as historically accurate as possible. At the same time, a certain amount of objectivity is unavoidable in the preparation of digital 3D models. There are on-

going debates concerning the accuracy of digital heritage materials.

Many researchers and practitioners in the field of museums, heritage and archaeology see the creative use of digital 3D models of heritage materials as anathema to the established uses of digital heritage materials to assist in research and education. The open and creative use of digital copies continues to be seen as a threat to museum culture and practise, based on the long-held fear that simulations could render physical collections of authentic artefacts obsolete¹. Another common fear in the heritage sector is that open engagement with digital heritage materials will distort the context and meaning of the original artefacts. These fears are heavily debated, with some arguing that multiplication of an object can increase its fame and lead to increased awareness and interest in the original item itself; 'the intensity of the search for the original depends on the amount of passion and the number of interests triggered by its copies' (Latour and Lowe, 2010: 4); 'Benjamin has the aura of art exactly the wrong way around. It is the (...) reproduction that created the aura of the original' (Walsh, 2007: 29).

2. Liminal 3D models

The digitisation of heritage artefacts is not as objective as the use of hands-free technologies might suggest. Digital 3D models have to be edited in many small and often imperceptible ways. There is no fixed point at which a digital model of a heritage

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¹ In his seminal piece *The Work of Art in the Age of Mechanical Reproduction* Walter Benjamin argued that the 'aura' of original objects would be lost through their reproduction and distribution. Jean Baudrillard further suggested that the shift from perceiving real objects to perceiving copies and simulations would result in a loss of reality.

artefact can be said to be 'complete'. Consequently, the choices and decisions of the editor play an important but often downplayed role in their creation. Digital 3D models look real, even though they are just a hypothesis of an artefact or space. However, while digital copies are not necessarily 'truthful' to the original objects, they can be seen to possess a different kind of authenticity. In *Languages of Art*, Goodman (1969) argues that any performance of a piece of art, which corresponds suitably to its notation (such as musical scores or code), can be counted as authentic. Digital 3D models are stored in bits, as ones and zeros. Bits lack intrinsic meaning until they are read and performed as, for example, a visual image or a physical print. Such performances exist as entry points to different perceptual planes, or interfaces, that render data into recognisable representations. Digital 3D models of museum artefacts are perceived 'in an unreal, virtual space that opens up behind the surface' of the computer screen (Foucault and Miskowicz, 1986: 24).

Digital 3D models are not fixed; they remain open to exploration and transformation. Digital 3D models can be accessed online all over the world. In this way they exist in multiple locations and states at the same time. However, digital models of physical artefacts remain embedded in the physical world and continue to share a meaningful relationship to the physical originals. The relation between digital 3D models and physical objects is not a duality between virtual and real, as 'human activity takes part in both' virtual and real spaces (Dziekian, 2011).

Digital 3D models are liminal objects located on the threshold between external reality and our own minds. Turner (1969) defined the liminal condition as 'the state and process of mid-transition in a rite of passage'; a 'moment in and out of time' (Turner, 1969: 96), the liminal phase of a transition represents an instance of incompleteness, when the liminal subjects 'elude or slip through the network of classifications that normally locate states and positions in cultural space' (Turner, 1969: 95). Although Turner locates liminality within ritual action the concept of liminality can be applied more broadly.

The liminal object has its origins in Winicott's notion of the transitional object (Winicott, 1971), and appears in discussions of technology and virtuality by Lévy (1998). A liminal object can combine seemingly irreconcilable binary oppositions, such as subject and object, mind and body, digital and physical. Digital 3D scans are such liminal objects; they exist on the threshold of reality and imagination. Interaction with digital 3D can also be considered to be liminal; when a user operates a conventional mouse and keypad to edit 3D files, pushing a button can be regarded as a metaphor for sculpting an artefact, which exists in a removed space (see Woo et al., 2011).

Liminal objects exist midway between two identifiable states, in 'a realm of pure possibility whence novel configurations of ideas and relations may arise' (Turner, 1969: 97), they are the 'basis of symbolism and creativity' (Turkle, 2011: 228). Liminal objects provide a 'basis of symbolism and creativity'; people frequently use liminal objects to weave 'a continuing narrative of caring and relationships as well as self-identity' (Fitzpatrick, 2012: 89). Liminal 3D models of heritage artefacts thus hold the potential to enable engagement with heritage artefacts that takes place on a personal and narrative level.

2.1. Fluid artefacts

Frequently museums and other heritage institutions respond with a certain alarm to the questions of interpretation and authenticity raised through 3D digitisation. However, heritage objects and museum artefacts can also be considered as a fluid medium. Without the knowledge and contextual material that give meaning to an object they possess little fixed content. Annis

(1986) identifies three conceptual realms in which visitors interact with museums; the cognitive space, the social space and the dream space. The cognitive space engages with factual information, it is supported through museum signage and other contextual data. The social space describes the socially interactive nature of the museum visit. The dream space, on the other hand, describes personal and subrational responses to museum objects. In the museum dream space loose associations, memories and emotions, popular media, personal experiences and thoughts can all influence how viewers make sense of our cultural heritage (Annis, 1986; Kavanagh, 2000). The thoughts and states of mind, which they carry into the museum influence how visitors see museum artefacts. This paper proposes that 3D technologies create a liminal space, somewhere between the tangible and the imaginary, with the potential to enable creative engagement with the experiential realm of the museum dream space.

Artefacts are useful devices to facilitate creative processes and museums frequently provide artists with rich material to inspire their art making. Creative thinking involves a number of processes in which sensory and cognitive stimulation impacts on thought patterns in order to generate novel concepts (Treadaway, 2009). Access to museum objects provides them with cues that can, for example, inform the use of colour, texture or form in new artworks. Memories of personal or cultural stories that are linked to prior knowledge or experience can be stimulated by physical characteristics of objects (Annis, 1986; Kavanagh, 2000). In this way museum objects can generate a wealth of associated ideas; these can be synthesised to produce completely new concepts (Smith et al., 1995). Digital 3D models of museum artefacts can inspire creative processes and promote the exchange of ideas in a similar fashion. Digital 3D models of heritage objects can provide a means of rapid interaction and translation from physical form to malleable virtual form that can help synthesise imaginative thought.

The creative engagement with digital heritage materials can be understood as a form of cultural 'poaching' (Certeau and Rendall, 2002). In his seminal work *The Practice of Everyday Life* De Certeau proposes, that human consumption is itself a creative act. During consumption, he argues, users recontextualise products, alter them and find unexpected uses for them. Certeau compares this to poaching; illegally hunting or catching game or fish on land that is not one's territory. Digital cultural materials can be 'poached' and recontextualised in ways that move beyond the control of the museum and other heritage institutions. This goes against the notion that there are appropriate and inappropriate ways of understanding and engaging with digitised historical materials.

3. From audience to users

For this research, a case study was undertaken in collaboration with the National Museum Cardiff, during which a range of artists was given access to digital 3D models of museum artefacts (Fig. 1). These artists were invited to create new work from the digital 3D models and the resulting artworks were presented in the National Museum Cardiff and online². This project follows a larger trend; the digital 'poaching' of heritage artefacts (see Section 2.1. Fluid artefacts). For this study, data was gathered through interviews with artists and through a visual analysis of the remixed artworks.

Increasingly, digital 3D models of museum artefacts, as well as digital tools and tutorials are available online. These resources enable larger audiences to engage creatively with digital 3D

² For more information see (<http://immaterialartefacts.blogspot.co.uk>), (accessed 09.04.2015).

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