REINTERPRETING VIRTUAL HERITAGE

JANICE AFFLECK AND THOMAS KVAN
The Department of Architecture, The University of Hong Kong, Pokfulam Road, Hong Kong SAR, PR China.
janiceaffleck@hkusua.hku.hk; tkvan@arch.hku.hk

Abstract. This paper describes the context and proposal for an alternative approach to the common pattern of application of digital tools in the area of cultural heritage, also know as Virtual Heritage (VH). It investigates and addresses rising issues in a digital case study developed to implement a theoretical framework and investigate how and if existing technology can support it.

1. Introduction

Digital technologies including multimedia and Virtual Reality and high-speed communication technologies have been increasingly employed in the documentation, representation and dissemination of cultural heritage. The term 'cultural heritage' refers to both the tangible and intangible aspects of the collective elements of a culture. These are increasingly perceived as commodities and as a result there has been much funding and activity over the last ten years, from individual researchers, academics, government bodies, research and commercial groups active in investigating applications in the field of Virtual Heritage (VH).

Although a digitally recreated artifact or site can never replace the experience given to us by the original, information and communication technology has a supporting role to play.

In this paper we address theoretical issues surrounding current VH and traditional heritage interpretation practice and utilise these to create a theoretical framework with which to investigate arising issues relevant to the creation of a digital case study.

2. Descriptive and Discursive Approaches to Virtual Heritage

The majority of VH projects follow a descriptive approach to the interpretation of data. This is categorized by projects whose focus was on creating a realistic representation of a cultural heritage site, aspect or artifact, at present or how it had stood in the past. Many of the authors had a background in computer graphics or computer engineering and were focused on the quality of technological and visual

aspects. The development of computer graphics hardware and software has been led by the leisure or gaming industry whose focus is on balancing real-time interaction with the creation of a realistic environment. In the context of this the descriptive focus of the majority of past and present VH is not surprising. The effect of this on the perception of computer generated images in VH, by the users is that the measure of a successful project is in its production of photorealism (Roussou and Drettakis, 2003). They further discuss that in VH the general perception is that the degree of realism directly maps the degree of authenticity. Authenticity of cultural heritage dominates public and professional expectations. There is reasonable concern regarding interpretation of historic data in VH. It is identified that how the data is interpreted is not communicated along with the model to the end users (Van Scoy, 2000). It is not always clear how accurate the information is, how far what is visualized is legitimate and what has been made up by the creators. Thus the level of accuracy, legitimacy and realism of content is analogous to the level of perceived authenticity. This perhaps is the most compelling reason behind the tendency of descriptive practice in VH.

In addition to the necessary continuing development of hardware and software to create virtual environments that have all the technological imperatives of 'real' environments, research should also address issues beyond photorealism such as interpreting and communicating the complexity of both tangible and intangible cultural heritage in a meaningful way. It is becoming apparent that digitally depicting heritage, no matter how seductive the resulting graphics are, does not represent the only research challenge and increasingly hypotheses made by technologists assume a mantle of reality. The users of VH and their needs have to be assessed and the projects focused beyond mere appraisal to a rigorous and complex critical review.

A smaller number of published projects utilized a discursive approach to the interpretation of cultural heritage, categorized by those whose motivation was on discovering, discussing and portraying the underlying meaning and character of a cultural heritage site, aspect or artifact. They tended to include authors from theoretical as well as technical backgrounds, such as archaeologists, who require active tools to aid in a process rather than the focus being on the end product.

3. Interpretation Theory and Practice: Recreation vs. Reconstruction

Interpretation is a key principle governing the management of cultural heritage and a field in its own right. Any interpretation attempts to understand the significance of cultural heritage in relation to a contemporary perspective. In the context of museum or heritage site interpretation, it covers all means of communication, first person such as a guide, printed and spoken word and a variety of multimedia presentation techniques.

According to Uzzell (1994), two approaches dominating interpretive theory

are *Re-Creation* and *Reconstruction*. The *Re-creation* approach attempts to bring the past to life, for example at a heritage site recreating all aspects of a fixed time period sometimes including interpretation by costumed guides. This requires a suspension of disbelief on behalf of the visitors in that they are actually interacting with artifacts and people of another time. The disadvantages to this approach, according to Uzzell are more fundamental. The presence and volume of public access alone interferes with authenticity. Instead of critical analysis of the surrounding social and political issues, a romanticized and health and safety conscious construction of the *past* is offered. Writers such as Lowenthal (1985) debate whether we can actually access or know the past, as we have the gift of hindsight. This calls into question the popular approach of transporting viewers to the *past*.

By contrast the *Reconstruction* approach debates the explanation of historic recollections in relation to and in the context of the present. It has influences from postmodernism such as plural interpretation and examining the past from multiple viewpoints. Postmodernism was in part a move away from Western ideas of the existence of scientifically proven, "*absolute truth*" (Lakoff and Johnston, 1980) which allowed significance to be deliberated by the individual. There is no need to create an atmosphere or suspension of disbelief as the past is related to the visitors' experience of contemporary life. Similar to the approach taken in theology, where the Bible is reinterpreted from a new perspective by each generation, independent of a scientific approach (Collinson, 2001).This approach is not as popular in heritage and museum interpretation as *Recreation*, possibly because it is more difficult to follow for the uncommitted viewer and is not entertainment led. At heritage sites there is an increasing trend to focus on the entertainment value offered to leisure-time users and tourists, rather than attempting to interact with the past in a meaningful way. The public expect authenticity when visiting a heritage site, this differentiates the experience from a leisure-based site such as a theme park but at the same time expect to be engaged and entertained during their leisure time. The field is increasingly absorbing ideologies from disciplines such as marketing, partly in order to be cost effective and also to compete in the market place with other leisure activity sites. This may in part explain the dominance of Uzzell's *recreation* approach.

Uzzell's categorization of interpretive theory into *Recreation* and *Reconstruction* parallels the two approaches in VH, of descriptive and discursive, respectively. This paper will attempt to utilise the *Reconstruction* approach to the discursive interpretation of cultural heritage within VH to explore if technology can offer new opportunities of portraying meaning in an engaging manner.

4. Theoretical Issues of Computer-Generated Models

Traditional media employed by historians, archaeologists or architects to

communicate significant sites or artifacts were drawing, photography and text. They recorded and represented the sites as manifest and according to standard conventions such as measured drawing. Excepting the use of painting or sculpture, for scholarly purposes the data was generally presented and described as accurately as possible. Digital media however, breaks with traditional linear descriptive representation, allowing the manipulation of data. The process of communicating the significance of a site or artifact, using digital capturing, modelling and rendering techniques are lengthy, labour intensive and therefore costly. Thus the resulting content has to be worth this expenditure and extend the characteristics of traditional media. Computer models have distinguishable experiential attributes, such as the ability to be dynamic for instance allowing deconstruction of parts, be inhabited by avatars to simulate social activity or by other *living agents* to simulate nature, and can be augmented by sound or viewed from any viewpoint. Digital tools extend the senses, such as sight and sound to enable the users to see and hear what is not immediately available or which does not exist. They have the potential to enable a shift from "*image capture to model capture*" where the users can direct the viewpoint, materials and lighting conditions to suit their own requirements. (Mitchell, 1998) The computer model would allow the content to be driven by the user instead of the author, similar to the development of text to hypertext.

Virtual reconstructions allow us to experience, amongst other things, heritage that is inaccessible and sometimes no longer existing. The manner in which they are produced however, is full of ambiguities. Reconstructing cultural heritage is an intellectual process, drawing from a variety of sources and data, which will not always be complete. It is important that the process of interpretation is discussed and highlighted and the results not presented as *absolute truth*.

5. Case Study: Aims and Objectives

This paper will investigate and develop a discursive approach to interpretation in a digital environment, similar to Uzzell's *Reconstruction* approach, and implement this in a proof of concept study. It will be developed initially on a theoretical basis. Specifically, it aims to allow the users to construct and generate interpretations using digital tools and techniques, rather than attempting to transport them back to the *past*. The users will be able to actively interact and interpret content, rather than simply passively navigate through it. The digital environment is flexible in the ability to evolve which is important as cultural heritage and the interpretation of it is constantly changing.

5.1. CONTEXT AND USER REQUIREMENTS

The focus of the study is a digital interpretation of a traditional Chinese temple

called Lo Pan Temple, located in Kennedy Town, Hong Kong. An existing 3D model by students of The University of Hong Kong, as shown in Figure 1, was utilised to investigate how to add further interaction and interpretational techniques to a computer-generated model created as Internet content.
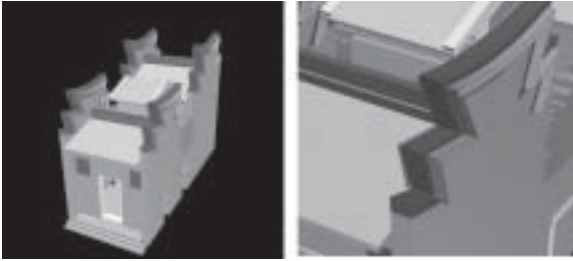

Figure 1. Existing 3D Model of Lo Pan Temple.

The need for interpretation to be planned is highlighted by Carter (2001). His format for an interpretation plan has been employed to create an interpretation plan for identified typical users of the site. This was then used to storyboard typical user scenarios before being implemented digitally.

5.1.1 Lo Pan Temple

Lo Pan Temple, shown in Figure 2, was constructed in 1884 in Kennedy Town, Hong Kong. Lo Pan is the Patron Saint of Chinese Builders and Constructors and worshipped by construction workers. It was built by donations to the Contractor's Guild, which consisted of local immigrant populations from southern China. This highlights the significance of Chinese associations in colonial times which the local Chinese residents set up to protect their interests.

Figure 2. Lo Pan Temple.

The temple is in a residential area, not on a tourist route, and is an active community building in Kennedy Town, one of the oldest residential areas of Hong Kong. The temple is in everyday use and hosts festivals such as the Si Fu Festival, the birthday of Lo Pan. The temple is privately owned and has not yet been declared

as a monument by the Antiquities and Monuments Office. This means that there is no legal, statutory protection of the building.

A building such as this, a privately owned religious site in everyday use, is not suited to onsite interpretation, especially the addition of onsite computer facilities.

Two identified typical users were residents and tourists, which could be further broken down into adults and children. Unless stated in this paper the users are assumed to be adult.

5.1.2. Structure

The system was designed around the assumption that content would be accessed offsite via the Internet. It enables content to be accessed onsite via mobile phones or PDA's with minimal disruption. The purpose of which is to enhance visitor understanding onsite.

It addressed problems of creating an environment that has authentic content but is flexible enough to allow users to deliberate a range of possibilities. It attempted to do this by the content being accessible to and driven by the users, in this case typical users of the building, in order to create meaningful and multiple interpretations of the significance of Lo Pan Temple. It focused on combining interaction with interpretation by allowing the users to personalise their workspace, to add their own interpretations of the history, function, form and usage, to manipulate the 3D model and to have the ability to interact with data onsite in a sensitive manner.

The 3D model acts as a visual metaphor and a key for orienting the interpretation

Function	User Access
INTERPRETATION Add information and interpretation to text, photographs and animations	Community
PERSONALISATION Personalisation of content and layout: take on site	Community
Engagement 2: Model capture Interaction and personalisation of the 3D model	Personal
3D MODEL 3D Model used as an interactive key to information—rollover hotspots to contemporary and historical multimedia content.	Community Personal
Engagement 1: Puzzle Model used as an engagement activity	Public

Figure 4. Structure of the system.

of significant features of the temple. In an endeavour to combine interpretation and interaction with the 3D model, two engagement tasks were designed to help the users interact with the form and layout of the temple in an enjoyable way. It is important to engage the users and task-based activities are enjoyable. It is a way of addressing users' preference for entertainment over educational content. Figure 4 indicates the functions and the type of user that can access each function.

5.1.3 User Requirements: Residents

The significance of the temple for residents is the role it plays in the social interaction of the community. The temple is a tangible expression of this and plays host to the intangible elements of their culture. The structure of interpretive objectives, taken from Carter's interpretation plan, is threefold. It reinforces the concept developed by Tilden (1977) that an interpretation should *provoke, relate and reveal*. The visitors should be affected on an educational, emotional and behavioural level.

Educational: to enable residents to share memories passed down by the older members of the community and understand the significance behind the architecture and imagery of the temple. Emotional: to assist the residents feel a sense of identity and pride. Behavioural: encourage the community to actively utilise and protect the temple.

In the context of creating the digital environment, a framework for harnessing community interaction was developed. It consists of a workspace, on top of which community groups can be organically formed to add multiple viewpoints, interpretations and narratives. Included is Engagement Task 1. The users deconstruct the model, which comes apart like a puzzle by directly dragging with the mouse. They can access further information about the elements.

The groups are self-administered and are able to access and contribute to the documentation of historical and contemporary living cultural heritage, including oral reminiscences, video footage of festivals and other community events, historical records, calendar of religious and community events and interactive community notice board. The groups have administrators who have the authority to ban users thus keeping the content controlled. The groups may range from residents, to local history enthusiasts to members of the Association whom may be resident or may be overseas. Group users are registered and log into a shared workspace, which allows them to add content. This is important to the theoretical framework as it facilitates first person interpretation and uses narrative to give different perspectives. In any historical account it is always the human aspect that interests us and storytelling is one of the oldest methods of cultural transference. Educationally, the system contains interpretations of the architectural form and the imagery contained in the ceramics, woodcarvings, frescoes and layout of the interior. The content would be created initially by a professional in the heritage field, which will then be added to and personalised by members of the community, as shown in Figure 5.

Figure 5. Interaction & interpretation with text & photographs.

Top left screen: model as interface for the content. *Top right screen*: accessing multiple interpretations. *Bottom left screen*: Adding an interpretation. *Bottom right screen*: Adding an interpretation to a photograph.

5.1.4 User Requirements: Tourists

The significance of the temple for tourists is the context of Hong Kong and Chinese architecture. The interpretative objectives for this group are: Educational: users will learn about the tangible and intangible heritage of Hong Kong. Emotional: users will be communicated the sense of place and identity. Behavioural: users will show further interest in the heritage of Hong Kong and China.

These users are not able to add interpretation, unless they join a group. However, they can benefit from first-person interpretation and can add to the visitor book, which is not administered. The system links to other relevant heritage interpretations both in Hong Kong and in China. It allows the users to create personalised content, which they can keep or access onsite in order to identify interesting features they highlighted.

Further exploration of combining interpretation and interaction takes the form of Engagement Task 2. This time users create their own walkthrough animations and select viewpoints for stills of the model, following Mitchell's (1998) idea of '*model capture*'. This is particularly useful for users who will never visit the site. Figure 6 shows interaction with the 3D model in the form of capturing stills from an animation and adding interpretation to the stills.
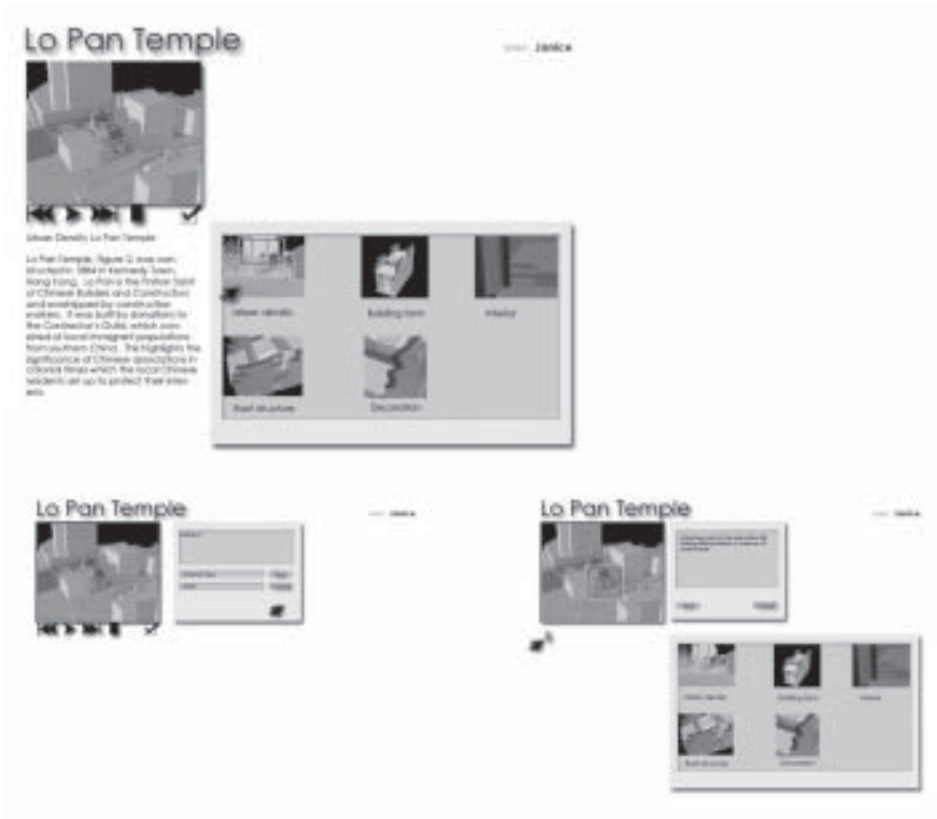
Figure 6. Interaction and interpretation of 3D model.

Top screen: browsing captured animation stills with associated interpretations. *Bottom left screen*: frame capture from animation. *Bottom right screen*: adding interpretation to still.

5.1.5. Children

This user group requires specific content designed for use by children. The nature of the content would depend on whether the children are participating in a school project or individually accessing the information. It would utilise devices such as narrative and would benefit from simple interactive manipulation tasks.

6. Future Research

The next step is to implement a system for a site that requires virtual reconstruction of the form. This will necessitate the investigation and testing of the process of enabling personal interpretation of a virtual reconstruction. The process is different than for an existing building.

A means for evaluating the system will be researched and implemented. This will be a method of highlighting and addressing potential benefits and pitfalls of this type of approach to the interpretation of cultural heritage to the public.

Acknowledgements

References

Carter, J. 2001, *A Sense of Place: An interpretative planning handbook,* Tourism and Environment Initiative, Inverness.

Collinson, D. 2001, Hermeneutics, Oxford, http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t118.e1190, accessed 2004/9 August.

Lakoff, G. and Johnston, M. 1980, *Metaphors We Live By,* The University of Chicago Press, Chicago, Chicago.

Lowenthal, D. 1985, *The past is a foreign country,* Press Syndicate of the University of Cambridge, Cambridge.

Mitchell, W. J. 1998, Foreword *Rendering real and imagined buildings : the art of computer modeling: from the palace of Kublai Khan to Le Corbusier's villas*, Rockport Publishers, Gloucester, p. 175.

Roussou, M. & Drettakis, G. 2003, Photorealism and Non-Photorealism in Virtual Heritage Representation, *in* A. Chalmers, D. Arnold and F. Niccolucci (eds) *First Eurographics Workshop on Graphics and Cultural Heritage,* Brighton, UK.

Tilden, F. 1977, *Interpreting our heritage,* University of North Carolina Press, Chapel Hill.

Uzzell, D. 1994, Heritage interpretation in Britain four decades after Tilden *in* R. Harrison (ed.) *Manual of Heritage Management*, Butterworth-Heinemann, Oxford, pp. 293–302.

Van Scoy, F. 2000, Documentation of Virtualized Architecture: A Proposal, *in* T. H (ed) *Sixth International Conference on Virtual Systems and Multimedia (VSMM) Connected: Next Generation Applications in Virtual Heritage, High Speed Connectivity and Commercial Collaboration*, vol., 1, IOS Press, The Netherlands, Gifu, Japan, pp. 185–189.