

**BEHIND THE PIXEL:  
PRACTICES AND CONCEPTS IN VIRTUAL ARCHAEOLOGY**

**WORKSHOP PROGRAM**

**14 December 2015, Barcelona, Spain**

**Organizers: Laia Pujol Tost (UPF, Barcelona)  
Sandra Montón Subías (ICREA-UPF, Barcelona)**

<b>8.45-9.15:</b>	<b>Registration</b>
<b>9.15-9.30:</b>	<i>Welcome address</i> , Angel Lozano, Vice-Rector for Scientific Research (Universitat Pompeu Fabra); Marició Janué, Director IUHJVV (Universitat Pompeu Fabra), and <i>Conference Background and Goals</i> , Sandra Montón and Laia Pujol (Universitat Pompeu Fabra).
<b>09.30 – 10.15</b>	<i>What are memories made of? The untapped power of digital heritage</i> , Neil Silberman (Coherit Associates).
<b>10.15 – 11.00</b>	<i>From pre-digital images to virtual reality: something new for archaeology communication?</i> , Paloma González and Clara Masriera (Universitat Autònoma de Barcelona).
<b>11.00 – 11.15</b>	<b>Coffee break</b>
<b>11.15 – 12.00</b>	<i>Interpreting Virtual Archaeology</i> , Sandra Montón and Laia Pujol (Universitat Pompeu Fabra).
<b>12.00 – 12.45</b>	<i>Smartbarcino. Technology as a tool for research and dissemination of archaeological heritage</i> , Carme Miró (Ajuntament de Barcelona).
<b>13.00 – 14.15</b>	<b>Lunch</b>
<b>14.15 – 15.00</b>	<i>Seeing the past; shaping the future: evaluating and developing augmented reality for public history</i> , Kevin Kee (University of Ottawa) and Timothy Compeau (Brock University).
<b>15.00 – 15.45</b>	<i>Beyond mere visualization: reverse engineering in archaeology</i> , Joan Anton Barceló (Universitat Autònoma de Barcelona).
<b>15.45 – 16.00</b>	<b>Coffee Break</b>
<b>16.00 – 16.45</b>	<i>Vision, space and society: communicational issues in archaeological applications of visibility analysis in three-dimensional architectural spaces</i> , Eleftheria Paliou (University of Heidelberg).
<b>16.45 – 17.30</b>	<i>The reflected past: exploring the processes behind digital reconstruction</i> , Grant Cox (Artasmedia).
<b>17.30 – 18.00</b>	<b>General Discussion</b>

## ABSTRACTS

### WHAT ARE MEMORIES MADE OF? THE UNTAPPED POWER OF DIGITAL HERITAGE

Neil Silberman, Coherit Associates LLC

The ICOMOS “Ename” Charter on the Interpretation and Presentation of Cultural Heritage Sites (2008) was one of the first set of global heritage policy principles entirely devoted to the general practice of cultural communication—in sharp contrast to earlier guidelines on the interpretation of specific subject matter (i.e. medieval architecture, rock art, or military history) or as a component of a wider heritage activity (i.e. site management, documentation of monuments, or cultural tourism). The Charter’s focus on the role of local and associated communities in the interpretive planning process, the inclusive representation of all groups linked to a site, and multiple written and oral sources of information it marked a clear departure from the traditional top-down paradigm of heritage practice. The traditional techniques of heritage interpretation were essentially object- or site-centered monologues, in which facts, dates, and historical figures were woven into an authorized narrative that “taught” the visitor to recognize what was important about the past and why its iconic material remains should be lovingly restored or protected from change. In contrast, the ICOMOS “Ename” Charter attempted to shift the focus to people, describing interpretation as a form of public polylogue about the contemporary relevance of all the activity, research, and creativity stimulated by a cultural heritage site.

Where do emerging Digital Heritage applications cluster along the spectrum from top-down to bottom up? And what are the actual and potential roles of Digital Heritage practitioners in shaping contemporary collective memory in a time of unprecedented social and demographic change? Why and how should the public be encouraged to interact digitally with the tangible and intangible remains of the past? Is it a matter of education, identity, patriotism, cultural assimilation, or just leisure time entertainment? Or is it a powerful manifestation of 21st century globalization? In attempting to provide insight into these fundamental questions, this paper will examine some of the conscious and unwitting motivations that lie behind the pixel and will suggest that Digital Heritage has enormous potential to creatively shape the future—rather than enhance the persuasive power of various vested interests and ideological orthodoxies in the world today.

### FROM PRE-DIGITAL IMAGES TO VIRTUAL REALITY: SOMETHING NEW FOR ARCHAEOLOGY COMMUNICATION?

Paloma González and Clara Masriera, UAB

Iconographic analyses have a long tradition in historical studies and, of course, in the study of art. In the last years the study of trends in image formation about prehistoric and ancient societies and iconic has been also increasingly tackled by archaeologists, with a special emphasis in the theoretical sources that nourish them. Stemming from

these studies it has been established the great communication power of these images, relating the viewer with reconstructed past scenes and objects. Both operate as metonymy of the periods they are designed to represent and lead, by a cognitive-interpretive process, to a specific creation of a social imaginary about the distant past. In this talk we intend to address the question whether or not the use of digital archaeological representations, especially those associated with Virtual Reality have generated a significant change in his power communication, which has been (or may be) its impact on the representation of the past, and if so, what are those aspects that make these digital images a new way to visualize archaeology.

## INTERPRETING VIRTUAL ARCHAEOLOGY

Sandra Montón and Laia Pujol, UPF

Any (re-)presentation of the past is an interpretation of the past. Different scholars in different disciplines have for long accepted that the construction of knowledge is situated, and thus influenced by the context where it takes place. Both in archaeology and history, critical theory has precisely scrutinized the logic that guides the production of the past in the present. However, it seems that Virtual Archaeology has heretofore “escaped” such examinations in the belief that it is able to convey objectivity and truth.

The analysis of VR technology and concept, and of the evolution of 3D models, from the first VR applications to the current field of research called Virtual Archaeology, has led us to the conclusion that this is due to factors related, on the one hand, to VR’s origins and capacities; and on the other, to some of the epistemological and methodological assumptions operating in Archaeology, which have been reinforced by the recent techniques in data acquisition. Yet, in our view, VR is far from such objectivity, assumed both by some experts and audiences. In fact, it often times reinforces a Western, masculine, positivist view of the past, and implicitly supports traditional (and much criticised) grand narratives. In this presentation, through literature review and empirical studies, we will discuss the underlying mechanisms by which this is made possible.

## SMARTBARCINO. TECHNOLOGY AS A TOOL FOR RESEARCH AND DISSEMINATION OF ARCHAEOLOGICAL HERITAGE

Carme Miró Alaix, Ajuntament de Barcelona

Although not always visible, the Roman past is present in current-day Barcelona. To put it into value, the Pla Barcino has been created under the motto "engage citizens with archaeology". Pla Barcino includes the project SmartBarcino: the use of new technologies in order to research and disseminate the Roman colony’s archaeological heritage.

One of its first actions has been “Barcino 3D”, an application available for computers, tablets and smartphones. It has been created by an interdisciplinary team directed by the Barcelona Archaeological Service and the Systems Department of the Institute of Culture. Doubts emerging during the working process have been sorted out following historical and heritage rigour. The resulting model has been recreated after work

conducted in the last hundred years by archaeologists, historians and epigraphists, amongst others. Information from scientific research conducted on Barcino has been complemented with data from other contemporaneous Roman cities and with urbanism treatises from the period. Accordingly, we have generated an ideal model and pose hypothesis about aspects of the Roman colony that are not yet known.

## SEEING THE PAST; SHAPING THE FUTURE: EVALUATING AND DEVELOPING AUGMENTED REALITY FOR PUBLIC HISTORY

Kevin Kee, University of Ottawa and Timothy Compeau, Brock University

Augmented Reality, like virtual reality, has the potential to revolutionize how we work, play, and study. For almost a decade, writers and thinkers have been predicting that AR will disrupt the museum environment and fundamentally change how historians and museum professionals convey knowledge to the public. Yet as a medium AR is still very new, and has not yet lived up to the initial hopes and predictions. It remains difficult to work with, it is prone to malfunction, and its uses remain tethered to traditional methods of museum interpretation.

In this talk, I will discuss how humanists and public historians can help guide the development of new AR and help pull the medium out of what the Gartner Technology Advisory Group refers to as the “trough of disillusionment,” and eventually reach “enlightenment” and “productivity”. Rather than wait for software engineers to develop AR for the museum space, museum professionals can be active in imagining new ways to use AR tell the stories of their artifacts and the people who created them. We will explore some examples of successful collaborations between humanists and engineers, and how artists, poets, and historians can play active roles in shaping the future of augmented reality. In this way we may open up the museum space to new voices and different cultural perspectives.

## BEYOND MERE VISUALIZATION: REVERSE ENGINEERING IN ARCHAEOLOGY

Joan A. Barceló, Universitat Autònoma de Barcelona

Why archaeological artifacts are the way they are? In this presentation I try to explain how to solve such a question by investigating the relationship between form and function. It is suggested a new way of studying how behavior in the past can be asserted on the examination of archaeological observables in the present. In any case, we take into account that there are also non-visual features characterizing ancient objects and materials (i.e., compositional information based on mass spectrometry data, chronological information based on radioactive decay measurements, etc.). Information that should make us aware of many functional properties of objects is multidimensional in nature: *size*, which makes reference to height, length, depth, weight and mass, *shape and form*, which make reference to the geometry of contour and surfaces, *texture*, which refers to visual appearance (micro topography –rugosity-, color variations, brightness, reflectivity and transparency), *composition*, meaning the combining of distinct parts,

elements or distinguishable entities to form a whole, and the manner in which such parts are combined or related, and spatial and temporal location. With the exception of compositional data, the other relevant aspects for functional reasoning have been traditionally described in rather ambiguous terms, without taking into account the advantages of quantitative measurements of shape/form and texture. The approach we adopt here is to follow current computational theories of object perception to ameliorate the way archaeology can deal with the explanation of human behavior in the past (function) from the analysis of visual and non-visual data, taking into account that visual appearances and even compositional characteristics only constrain the way an object may be used, but never fully determine it.

## VISION, SPACE AND SOCIETY: COMMUNICATIONAL ISSUES IN ARCHAEOLOGICAL APPLICATIONS OF VISIBILITY ANALYSIS IN THREE-DIMENSIONAL ARCHITECTURAL SPACES

Eleftheria Paliou, University of Heidelberg

Visibility analysis in three dimensional spaces refers to a set of techniques that aim to analyze the visual properties of 3D environments or objects situated in them by combining common functionalities of 3D modelling and GIS software. This presentation will discuss the ways in which computational visibility analysis can help examine in a formal way socio-symbolic aspects of visual communication in past architectural spaces. More specifically, through a number of archaeological case studies it will present a methodological framework that seeks to support scholarly endeavors to understand how viewers in the past could have experienced and conceptualized their architectural environment in the context of past social practices. Despite its quantitative nature this approach does not claim to offer an “objective” view of the past. On the contrary, it explores ways to incorporate uncertainty and fuzziness in the results of the analysis, and adopts a context specific perspective that aims to capture possible differences in the experience of stationary and mobile perceiver, to highlight divergent male and female experiences of space and fuse vision with other sensory modalities, such as sound.

## THE REFLECTED PAST: EXPLORING THE PROCESSES BEHIND DIGITAL RECONSTRUCTION

Grant Cox, Artasmedia Ltd.

For years the integration of digital technologies within heritage has been frequently viewed as an intensive application of algorithms, ‘one click’ solutions and computational objective processes. Due to this ideology, arguments regarding realism, misrepresentation and responsibility have not only masked inadequacies in practitioner application, but also exposed underlying inconsistencies and insecurities in the wider archaeological community. Misrepresented and often masked behind jargon and naivety, discussions relating to what these technologies can offer and how valuable they can become as interpretative and expressive tools at creating reconstructions and visually appealing imagery are highly underdeveloped in comparison to evocative visions of an artificially driven discipline, with very little human involvement.

Yet, as heritage professionals begin to master these adopted skills, assimilating them into a multidisciplinary proficiency, discussions regarding how and why they are initially adopted are beginning to arise and crucially, impact upon archaeological discourse. This is creating a renewed sense of responsibility from the creators of reconstructions and providing an increasingly open approach to the visualisation process.

Using several personal case studies (Such as Catalhoyuk and The Portus Project) and commercially driven experience, this talk will explore the popular processes often used to create high quality 3D still imagery/animation, the fashions behind them and my personal psychological evolution from initial exploration into these technologies as an archaeologist, to contemporary reflections as a practicing 3D artist.