Perry, S., Roussou, M., Economou, M., Pujol-Tost, L. and Young, H. (2018) Moving Beyond the Virtual Museum: Engaging Visitors Emotionally. In: 23rd International Conference on Virtual Systems and Multimedia (VSMM 2017), Dublin, Ireland, 31 Oct - 04 Nov 2017, ISBN 9781538644959.

Moving Beyond the Virtual Museum: Engaging Visitors Emotionally

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Abstract—**In this paper, we firstly critique the state of the art on Virtual Museums (VM) in an effort to expose the many opportunities available to enroll these spaces into transformative and engaging cultural experiences. We then outline our attempts to stretch beyond the usual VM in order to connect it to visitors in a measurably emotional, participatory, interactive and social fashion. We discuss the foundations for a conceptual framework for the creation of VMs, grounded in a user-centered design methodology and related design and evaluation guidelines. We then introduce two main cultural heritage sites, which are used as case studies at the core of our efforts, and conclude by describing the many challenges they bring for pushing the boundaries on the human-felt impact of the virtual museum.**

Keywords— virtual museum; emotive storytelling; user-centered design methodology

I. INTRODUCTION

The concept and components of Virtual Museums (VM), even though they may not have been coined this way in the past, have a relatively long history. Nearly 90 years ago, Kiesler [1] described the possibilities of the 'telemuseum' in terms not dissimilar to the VM of today. Since its later definition as a real museum represented in a digital form [2], the Virtual Museum has grown to become an all-encompassing term, referring to all types of digital representations of both digitized physical objects and born-digital ones that can be related to the physical objects [3]. To date, most VMs offer object-centered online exhibitions using primarily images and text, but also three dimensional reconstructions of entire archaeological or heritage sites[i]. In many cases, their representations of artworks and sites are of very high-resolution[ii].

Nevertheless, over the past 20 years, while technological possibilities have progressed and understanding of museum visitor needs and expectations have diversified, developments, at least conceptually, in the VM sector have stood comparatively still. Despite their endurance and promise, virtual museums seem generally to have escaped complex engagement with recent museological theory and practice, for example the growing interest in participatory models [4] and co-creation [5], in social and activist and decolonizing methodologies [e.g., 6], and in challenging the supremacy of the object and physical collections. Recent studies show that online museum collections are among the least popular features of a museum website [7, 8]. Moreover, despite their radical potential, VMs arguably privilege traditional didactic educational objectives [9]; they take little, if any, account of repeat visitors or group visitation; and they may ignore the significance of both the visitor agenda (after [10]) and the pre- and post-visit user experience. In this sense, they could be viewed as still rather immature cultural constructs, while their relevance and resonance for everyday visitors can be debatable.

To date, the majority of self-described VMs have primarily foregrounded the delivery of informational content, solitary visitor engagement, limited (mostly navigational and hot-spot based) interactivity, and the rather conventional curation of digital content. There are some innovative recent examples which diverge from this model (e.g., [11, 12]) but these exceptions tend to confirm the general rule. In some of these examples, we can see experimentation with the foundations of more affective and engaging encounters with virtual museums, including storytelling, personalization, adaptation and social media connectivity [13], yet there is more work to be done in this direction if the VM is to realize its rich potential.

The four-year European Commission-funded V-Must project (Virtual Museum Transnational Network, 2011-2015) carried out significant work capturing and recording the various VM projects around Europe and beyond [14]. As a result, it proposed a general framework, based on the concept of the "responsive museum" [15], which captured the general aim of museums as participative nodes of communication built around collections. The framework provided some guidelines for implementation, such as interactivity, personal experience, rich content, narratives, and coherent display of exhibits, but it did not delve deeper to elaborate on the problem of the interpretative approach of VMs. This lack of engagement with the interpretative content underpinning VMs has largely hindered their impact and development. Here we explore the

issues in greater detail in relation to VMs produced for cultural heritage sites.

In this paper, we firstly critique the state of the art on virtual museums in an effort to expose the many opportunities available to enroll these spaces in transformative and engaging cultural experiences. We then outline our attempts to stretch beyond the usual VM in order to connect it to visitors in a measurably emotional, participatory, interactive and social fashion. To do this we have drawn current museological theory and practice together, integrating these with diverse digital innovations, creating meaningful experiences for both individuals and groups in on-site, off-site and hybrid (simultaneously on-site and off-site) environments, as well as in synchronous and asynchronous situations. We offer a glimpse at an emerging conceptual framework for the creation of VMs, grounded in a user-centered design methodology and related design and evaluation guidelines. We introduce two main cultural heritage sites which are used as case studies at the core of our efforts – a remote prehistoric site in western Asia and a city-center based exhibition of a Roman site in a European museum – and describe the many challenges they bring for pushing the boundaries on the human-felt impact of the virtual museum. We then describe our user-centered agile design process, reflecting on the unique means we have adopted, such as "group personas" [16, 17, 18], for defining collaborative and affective user experiences delivered through different technologies, at different times, in different places. Finally, we put forward preliminary evaluation results from our earliest project use cases, highlighting the still mostly untapped potential for VMs to be emotionally-transformative vehicles for the cultural heritage sector.

II. State-of-the-Art in Virtual Museums

A critical mass of researchers and practitioners in the field of digital heritage consider a VM as a cohesive, yet distributed set of tangible objects and intangible concepts held together by overarching themes [3]. This definition essentially includes anything, from online digital libraries of cultural content, e.g. in Europeana, to 3D reconstructions showcased as pre-rendered films or as part of real-time virtual reality installations, mobile guided tours, and in-gallery interactives. Even museums' Web 2.0 presences have been regarded as virtual museums.

In most cases, an object-centered, information-heavy approach is assumed. Indeed, the first cultural heritage-oriented VMs of the nineties were web-based repositories focusing on the presentation of collections of objects[iii]. Later, 3D technologies started to often be deployed to represent both objects and spaces, some with annotation capabilities, short explanatory videos and background information[iv]. A common approach to VMs uses photorealistic representations of physical spaces, i.e., photographic, panoramic self-guided presentations of closed spaces[v][vi][vii] or open-air archaeological sites[viii][ix][x]. In the past, these types of VMs were mostly implemented with VRML, QTVR, and Adobe Flash[xi]. Recent advances include high resolution Gigapixel panoramic aerial photography[xii][xiii] or various other combinations of photographs and visualization[xiv]. The popularity of inexpensive cardboard viewers has led many cultural organizations to offer stereoscopic versions of these (augmented with informational hotspots) panoramas[xv]. The 3D

space may also be a digital representation of a real location[xvi][xvii][xviii] or even a representation of imaginary physical spaces which look and operate as real museums, yet where no physical museum exists[xix][xx]. Interactive capabilities in VMs of this type are usually limited to navigation and the selection of 'hotspots'. Some VMs add features that provide a relative sense of visitor personalization, control and sharing, e.g. the ability to compare and add to one's collection[xxi][xxii], or to even add high resolution images of whole artefacts or their details and later use them for customized printouts to share on social media[xxiii]. An early approach to personalization was Walker Art Center's "Through your eyes", presenting the views of the collections by specific visitors.

The advent of mobile technologies has resulted in an explosion of mobile multimedia guides, mostly used for on-site guided tours[xxiv] [19]. Such guides are object-centered audio descriptions (commentaries) by a friendly yet authoritative voice, providing a visual exploration of objects, and, in more recent examples, a basic personalization approach (e.g., "time", "language", "interest", with the latter allowing the creation of a digital souvenir). In some cases, due primarily to the nature of the cultural content, there are mobile guides with more story-like descriptions, e.g., the collection of audios by the Anne Frank Museum[xxv][xxvi], for use by the large number of visitors queuing outside the museum waiting to enter. In one example the mobile guide is also used for data collection in order to personalize both the onsite as well as the post-visit experience[xxvii]. During the physical visit, visitors are given a mobile device, which provides information on each exhibit as well as a customized post-visit experience. Data is collected using location sensing on the mobile guide to present the visitors with everything they have seen and not yet seen. Every bit of rich media accessible in the gallery is accessible post-visit, as is a 3D rotational view of each visitor's visit path through the galleries. Visitors can save, 'like', 'hate' content, etc. There is a requirement to visit the actual museum before making content accessible. Upon finishing, visitors provide an e-mail address and can then use it to access the post-visit experience on the web. Moving more decisively towards a story-centered approach, the CHESS experience placed emphasis on the on-site presentation of museum objects through personalized interactive stories [16, 17, 20].

III. Virtual Museums' Interpretative Approaches

Despite offering tools for personalization and even when they adopt storytelling approaches, VMs have largely followed the wider tendency in the cultural heritage sector to use narrative narrowly, as a method to communicate to the public the findings and research conducted by the domain experts of a cultural site or collection. In the same fashion that museums, for instance, "tell stories" through the informed selection and meaningful display of artefacts and the use of explanatory visual and narrative motifs in their physical exhibits [21], VMs have attempted to do so in the virtual realm. This interpretative process, whether in the physical or digital context, is at the heart of the museum as an unassailable institutional authority [22, 23]. Nevertheless, storytelling as applied by museums, including VMs, has for the most part been limited to descriptive, scholarly prose. Despite the continuous improvement of their

technological features, the underlying interpretative approach of most VMs has followed the traditional example of many cultural heritage collections and sites whose meaning is typically communicated *in situ* in didactic fashion, disconnected from the emotions, evocations and morals which inspire and motivate the larger world [24].

Where emotive forms of storytelling have been engaged in heritage and museum interpretations, whether in digital form or not, these have often been regarded suspiciously by domain experts as part of the so-called "Disneyification" or commodification of the past [25]. Despite decades of reflection on the power of 'resonance', 'wonder', 'provocation' and 'feeling' for cultural sites [26, 27, 28], as well as related evidence that indicates personal experiences at these sites lead them to be more lastingly remembered [29], restorative [30] and sometimes transformative [31], emotion has generally been avoided in discussions of heritage and museums until relatively recently [25]. Even where such discussions have been initiated, they regularly amount to purely theoretical reflections (e.g., [32]). When experienced, their impacts seem to be oriented towards the individual visitor (even in cases where they specifically seek to create "people to people encounters" [33], and even knowing that most sites are visited in groups). And when developed, they are usually directed at sites from recent or historic times which have relatively robust material and ethnographic data to support them.

This is critical because many heritage sites have few remnants that are either visible or relatable to the broad public. As such, they may not have enough resonance to engage visitors on their own or through standard interpretational means. Archaeological sites and objects, for instance, are often remote, poorly preserved, always fragmentary and therefore difficult to understand, let alone humanize. Intangible heritage, by its very name, is also often elusive or abstract, hence difficult to pin down in typical museological fashion. Even those conceptual frameworks which have been established specifically to enable emotive storytelling in cultural heritage (e.g., Uzzell and Ballantyne's [34] 'hot interpretation') appear hostile to the possibility that such sites might be tailored for intimate emotional encounters.

More recently, the introduction of VMs in the form of multimedia guides and, especially, mobile augmented and virtual reality has sought to improve this predicament [35]. However, current digital tools often convey information or display empty reconstructions that, in contrast to filmic and literary engagements, fail to bring these sites and artefacts back to life on an emotionally-evocative level [36, 37]. Similarly, most also fail to use their dynamic nature to gather and cross-culturally evaluate details about visitors themselves (their inspirations, their common narratives, their drivers for engaging with the past), except for on simple quantitative levels (e.g., [38]).

Research that attempts to push on the boundaries of VMs and their surrounding constructs has begun to recognize the promise of evocative digital experiences for heritage locations, including fragmentary sites [39, 40]. We aim to push even further in this direction, working from the premise that museums and archaeological sites are, in fact, highly emotional places if we

leverage their visiting audiences and their dramatic potential. We believe that heritage and museum visitors' experiences can only contribute to 21st century cultural affairs if the emotional aspects of their visit, including their interactions with other visitors (who may be online, on site or both), are taken into account. Moreover, we believe that all cultural sites, regardless of age, location, state of preservation, etc., are seedbeds not necessarily of knowledge alone, but of human connection, introspection and collective future-building, made possible via shared encounters. We thus propose *emotive storytelling* as the conceptual glue that should be set forth by VMs. Through the EMOTIVE project we have begun to test, in practice, the nature and impact of such an approach. Ultimately, EMOTIVE emphasizes the creation of drama-based or otherwise affective narratives that contain careful references to cultural content, manifested with rich digital media and applications.

IV. TOWARDS AN EMOTIVE VIRTUAL MUSEUM

Our approach extends beyond the traditional offerings not only of VMs, but of museums and cultural sites more generally. In all cases, these sites typically aim first (as summarized by [41], [42] and others) at providing meaningful learning experiences for their visitors, privileging education at the expense of other forms of audience outcome. Especially problematically, these approaches to learning still often deploy what Franklin and Papastegiadis [43], drawing on the work of Hanquinet and Savage [44], call an "older, culturally paternalistic form [of] 'educative leisure' that appeals only to a very narrow band of the educated middle classes."

While it is increasingly common to see museums seeking more varied and complex outcomes, including the facilitation of attitudinal and value change, social activism and social consciousness amongst visitors, the creation of intellectual and emotional experiences that stimulate people's curiosity, excitement, and empathy for the world today, and even more radical impacts including attention restoration, therapeutic change and personal transformation, the research on these outcomes - including rigorous models of practice to achieve and evaluate them - is disparate and arguably quite weak in terms of the evidence and its generalizability. Watson [45, p. 286], summarizing the work of Pekarik [46], expresses the problem succinctly: "more attention needs to be paid to what visitors feel…it is this that they remember after their visit, rather than any 'learning' they have undertaken." Indeed, as Watson [45, p. 284] herself notes, the situation is more complicated than a simple divide between learning and feelings, because both are entirely entangled. As Smith and Campbell describe it [25, p. 299] "emotions are both evaluative and an essential part of reasoning". To account for one without concern for the other is to fundamentally misunderstand human nature. Ample research (e.g., [47]) demonstrates that emotions trigger attention and memory, which are critical to learning itself. This research goes further to suggest that the key challenge is thus in managing the balance—providing emotive experiences that enable learning rather than eclipsing or privileging it, therein ensuring impact.

In the cultural heritage context specifically, attention to 'what visitors feel' has been highly confined. Here, emotionally-evocative interpretation is almost exclusively limited to 'dark', 'difficult', modern or historic (meaning within

the period of written/documentary history) subjects, especially those related to trauma and extreme suffering from the recent past. Premodern and prehistoric heritage rarely feature in these initiatives. As a result, vast swathes of the content of many cultural heritage institutions (including archaeological sites) are seemingly left devoid of affective impact. Moreover and unsurprisingly, best practice guidelines for achieving such impact are very presentist in nature, focusing on the provision of first-hand testimonials, speeches, photo/filmic evidence, oral histories and memories, all drawn from documentary sources to enable visitors to directly access the real 'lived' experience (e.g., [42]). As no such documentary sources exist for the prehistoric context, and as some archaeological sites (not to mention intangible heritage) may have little to no visibility today, these guidelines have debatable relevance.

By our reckoning, then, no coherent framework of practice (neither a conceptual model, nor practical guidelines) yet exists for designing and evaluating emotive experiences for the cultural heritage sector at large. More precisely, and as previously noted, VMs have often escaped critical discussion of their interpretative approaches, meaning that their best practices tend to focus around more functional concerns, such as usability and portability, or else on standard pedagogical objectives. This is in spite of the fact that VMs typically have an express concern for generating positive user experiences (UX). For instance, V-Must [48], adopting the ISO[xxviii] definition, explains UX as "how a person feels when interfacing with a system." Here feeling is only partly understood as emotion. In fact, amongst its nearly 30 quality criteria [49] for VMs, "emotional engagement of the visitor" is but one minor entry, and a topic that is not explored in any depth in the available project reports. Moreover, V-Must's analysis of the quality criteria of international awarding schemes for digital heritage and VM initiatives [49] indicates that these schemes themselves have little explicit or clearly-defined interest in emotional impact. Tellingly, V-Must notes that its own overarching "museological quality" category (under which "emotional engagement of the visitor" is considered one of six measures of VM museological best practice) seemingly falls entirely outside of the brief of such awards schemes. Instead, the awards appear to bestow their honors upon initiatives which are premised on traditional matters of pedagogy, technology and visualization quality [49].

Solid frameworks for developing and evaluating emotional engagement in VMs thus appear slim on the ground. Outside VMs, in the museums and cultural sector more broadly, multiple such frameworks exist, but of varying quality and applicability for heritage sites and collections. These include very loosely conceived approaches focused primarily on design, such as Witcomb's [42] "pedagogy of feeling", which advocates for the deployment of certain aesthetic and narrative interventions in museums (e.g., the juxtaposition of contrasting displays, experimentation with visitor flow and architecture, use of first-hand accounts, etc.) to stimulate visitors' senses and to prompt introspection. Others, like Smith's [50] "registers of engagement", focus primarily on audience evaluation (although its specific components are not reported in any of the published literature to date), using the resulting data to help determine the sources of visitors' emotional or transformational experiences. In Smith's model, visitors are apparently assessed (via open and

closed interview questions) on the degree and nature of their engagement or disengagement with sites, and the conservativeness or progressiveness of their responses. Still others, such as De Bruijn's [51] (also see [52]) analytical framework for fostering historical empathy, and Nilsen and Bader's [53] seven actions for promoting empathy in the museum, narrow in on the design of one specific emotional outcome - in this case empathy. Here interpretative tactics such as role play, reenactment, perspective-taking, experiments with narrative mode and structure, among others, are highlighted as efficacious empathetic devices. In De Bruijn's case [51, also 52], the framework goes further, aiming to articulate a robust evaluation methodology too.

Amongst current evaluation methods, particular tools also exist to measure emotional responses. These include more long-standing and widely-applied tools such as Bradley and Lang's [54] SAM (self-assessment manikin), which entails a non-verbal, picture-based questionnaire to assess a person's pleasure, arousal and dominance-oriented reactions to stimuli. We also see more contained, project-specific tools such as Reason's "Where in your body" online application[xxix] wherein users denote and explain where exactly inside their bodies they feel they have been viscerally affected by a cultural (performing arts) experience. Similarly, the European-funded meSch project has developed its own 'affective impact survey', wherein visitors rate (on semantic differential scales) their moods and feelings about both the content/narrative of a cultural heritage exhibit and the digital technology that mediates the exhibit [55, 56]. Here the meSch team draws on UX evaluative models, noting with surprise that "despite the fact that museums are clearly emotional places" there is little evidence of application of these models in museum or visitor studies overall [55, p. 73].

Ultimately, there is a significant, often speculative - but not yet cohesive - body of research about specific triggers of emotional and empathetic engagement in relation to the cultural heritage sector. As well, we see an array of evaluative tools for measuring such engagement, however these too are often poorly reported or deployed in manners which are difficult to fully understand or replicate. EMOTIVE, therefore, aims to synthesize, sympathetically adapt and test these existing models of practice through a program of digital work at two challenging pre-modern and prehistoric heritage sites.

V. PRELIMINARY EMOTIVE PROJECT WORK

Motivated by the premise of designing VMs that focus on engaging their visitors emotionally, the EMOTIVE project has embarked in designing digital experiences which seek to:

- adopt a story-based rather than an object-based approach, supporting interaction between (virtual) characters as well as real visitors, as well as engagement with the objects;

- blend the online with the on-site experience;

- seamlessly integrate the pre-, during, and post-visit activities, and the intangible with the tangible;

- cater to the dominant visiting patterns of museums and cultural heritage sites, which primarily see groups of

visitors participating in social experiences with varying - sometimes conflicting - individual motivations;

- integrate exploration of hybrid 2D/3D spaces in meaningful ways which support the storytelling and the social and emotionally-engaging experience of the visit.

Fig. 1. Developing a prototype collaborative visitor experience at Çatalhöyük (Summer 2015).

Two main UNESCO-listed cultural heritage sites provide the testbeds for our work: Çatalhöyük, a neolithic settlement in Turkey (Fig. 1) and the Antonine Wall display at the Hunterian Museum of the University of Glasgow in Scotland. Although very different on many fronts, these archeological and museum sites bring in a variety of challenges when setting out to design digital on-site and/or off-site experiences for their visitors. These include diverse visiting audiences, a majority of whom come in groups and who may have other priorities competing for their attention; a general reliance on traditional forms of didactic, glass-box display; temporal distance of the subject matter from the audience (meaning visitors may have difficulty relating to or conceptualizing the archaeological sites and their occupants); and a present-day context that looks nothing like its past context. For example, the site of Çatalhöyük is today characterized by poorly preserved architecture and a lack of visible artefacts or features; and the Antonine Wall, despite its importance as the northernmost frontier of the Roman Empire, is today characterized by fragmentary remains, meaning that it is challenging to re-contextualize the physical site within the relevant display at the Hunterian Museum. All such challenges are common in different forms and varieties among several, if not most, cultural heritage sites and museums around the world. In the first instance, then, we focus in-depth on these two case studies and their particular contexts to test the storytelling, social, interactive, and emotionally-engaging approach of the EMOTIVE project, and from there we aim to progress to a second stage of synthesis to draw generalizable conclusions and propose a set of methods for both designing and evaluating effective and impactful VMs, building upon the frameworks discussed above.

A. User-Centred Design Methodology

The driving force of EMOTIVE is its experience-oriented, user-centered approach, which aims at ensuring that its users' needs are perfectly addressed, thus maximizing the acceptance of the proposed solutions and their potential for use in pragmatic situations.

To support this approach, a user-centered design philosophy underpins the whole project, both in the design and the evaluation phases. We started out by defining personas for both sites, adopting different strategies for each based on their common visitor profiles (i.e., at Çatalhöyük visitors never come alone - only visiting as part of formal or informal touring groups). Personas, a construct used in the Human-Computer Interaction field to describe an archetypal user in a compelling and succinct way, have been applied in previous cultural heritage projects with beneficial results [16]. Here we have worked to extend the concept to account for the social dynamics of cultural sites and the group-based nature of most visits to these sites. To this end, we have defined 'group personas,' alongside individual personas, in order to more richly conceive of visitors as social agents within the cultural heritage context.

We tested the personas at our first user experience design workshop in February 2017 and then again in May 2017. During both sessions we split our workshop participants into groups and asked each group to design an EMOTIVE experience for their designated persona or personas (Fig. 2).

Fig. 2. Participant at 1st EMOTIVE User Workshop (University of Glasgow, Hunterian Museum, February 2017) studying the project's personas.

At the end of the design process we asked our participants to dramatize the experiences they had designed. And the groups obliged by actively taking on the character of their personas as well as, in some cases, the EMOTIVE application itself (Fig. 3). This dramatization of ideas using the "entire body" may be referred to as "bodystorming", a technique often employed in interaction design and creative development [57], [58]. The intent was for participants to imagine what it would be like if the product (or EMOTIVE experience, in this case) they designed existed, acting as though they were using it and/or brainstorming its possible applications. Dramatising the experience and personas within the Antonine Wall display allowed the groups to think about how the personas would physically interact together, within the actual display space, and allowed the research team to think further about group experience dynamics. The dramatisation was evaluated positively by participants and allowed the personas to "come to life". The overall experience of using the personas helped all groups focus on real users and, for the research team, enabled

us to begin considering the crucial components to developing participatory, emotive stories for cultural heritage VMs.

Fig. 3. Workshop participants dramatising the EMOTIVE application they designed for The Hunterian Antonine Wall display in February 2017.

B. Preliminary Results

Our early design workshops have led to development of prototype EMOTIVE use cases for both sites, targeting different visiting contexts (e.g., on site versus remote visitation; synchronous versus asynchronous visits; individual versus group experiences), different technological and mobility demands (e.g., mobile-based delivery versus stationary PC-based), and different media assets and communicative priorities (e.g., visualization via virtual reality versus chatting via chatbot). One such use case, a collaborative on-site experience at Çatalhöyük, seeks to introduce and explore the concept and socio-political affordances of egalitarianism (as it is hypothesized to have existed in Neolithic Çatalhöyük) via asking visitors to enact the process of letting go of ownership, giving away possession of something of their own without expectation of anything in return. Pairs of visitors are required to complete a pre-visit questionnaire that matches them to a particular personality (e.g., artist, storyteller, hunter) and object (e.g., figurine, stamp, stone blade) from Neolithic Çatalhöyük. Once on site, the pairs collect their objects, personalize them, embed them with their personal digital data from the questionnaire (via transfer of data from their mobile phones through NFC tags affixed to the objects), and then share them with others through geo-referenced physical and digital transactions. We are interested in the potential for this use case to not only engage visitors in learning about egalitarianism, but, more importantly, to generate emotive experiences among users in the moment, particularly feelings of togetherness, cohesion, connection to the site, and empathy, in relation to the past people of Çatalhöyük and to present-day tourists to the site.

This particular use case grows out of experimentation with several strategies (some more abstract, some quite specific) for fostering emotional connection and empathy in museums. For instance, Savenije and De Bruijn [52] hint at the effectiveness of imitation and replication via verbalization for helping individuals to identify with people from the past. Franklin and Papastegiadis [43] speak more generally about the potential impacts of integrating humor, conversation and body-related themes into exhibitions. And Simon [59] discusses acts of reciprocity in the museum environment. Here we draw these presumed emotive triggers together into an embodied experience of egalitarianism for visitors to Çatalhöyük. Our earliest formative evaluations of the experience (based on observations and interviews with pairs following their participation) are positive. One British participant describes becoming connected to past inhabitants of the site: "I feel in touch with the people…like, you can actually begin to imagine what their life was actually like." Another speaks of her own introspection, induced as a result of the experience: "It felt it was more about us…placing us in the situation, and making us think about each other and our opinions and our thoughts...I felt…like I was exploring myself in that situation." A Turkish participant is overt about his personal reactions: "I feel emotional…it was the most perfect thing I have ever felt in these houses…It was a lovely thing for me."

While our research is at its beginning and our evaluation framework is under development, the early results hint at the prospects for VM-based emotive interpretation to reconfigure visitors' relations with cultural heritage sites.

VI. Conclusions

Ultimately, we hope to challenge the digital, heritage and museological communities to take better account of the tremendous emotive potential of the virtual museum. We believe that combining theoretical frameworks which have been tested in practice in real cultural heritage contexts is the key way forward for future 'emotive' work. In this direction, the complexity of issues involved demands a multi-disciplinary approach combining and triangulating different design techniques and evaluation methods. It also necessitates the collection and analysis of a large body of data, combining both qualitative and quantitative tools. While much work has yet to be done, we believe that the development of VMs that resonate with visitors has major intellectual and social implications for the creative industries, cultural institutions and users at large.

Acknowledgment

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