VIRTUAL NARRATIVES FOR COMPLEX URBAN REALITIES: HISTORIC NICOSIA AS MUSEUM

Dr Georgios Artopoulos[a] and Dr Nikolas Bakirtzis[b]

[a] *Science and Technology in Archaeology Research Center, The Cyprus Institute, Cyprus g.artopoulos@cyi.ac.cy;*

[b] *Science and Technology in Archaeology Research Center, The Cyprus Institute, Cyprus, n.bakirtzis@cyi.ac.cy*

ABSTRACT: This paper addresses complex historic sites as museum assemblages that can sustain the theoretical and practical development of hybrid digital environments that stage urban narratives of the human experience in contested urban realities. This research framework is implemented in the on-going study of the experience of heritage along the 'Green Line' of Nicosia, Cyprus that still divides the city between Greek and Turkish Cypriots. Research results contribute to innovative methods of capturing, analyzing, archiving and visualizing information about the use of historically complex public spaces in contested urban environments. In this context, performative strategies of enacting, way finding and flaneurism can offer new methods to inhabit constructed realities and place visitors of archaeological sites, monuments and museums in the action of narratives related to exhibited artefacts and monuments of cultural heritage, instead of imposing 'formalized' knowledge (e.g. what all should know). The presented research is concerned with an experimental responsive apparatus that functions as a locus for uncertain patterns of interpretation and interaction, emerging through its capacity to sustain multiple narratives between visitors, artefacts and monuments. For the purposes of this paper archaeological sites and monuments are treated as museums containing condensed layers of inhabitation, use and experience.

1. INTRODUCTION

Inspired by Gilles Deleuze's concept of *assemblage* [1], the paper starts with a discussion about the structure of the contemporary museum as an assemblage of stories and objects. This is a transitory formation, which in turn contributes to other, more extended configurations (i.e., histories) - in order to explore mechanisms that enable indeterminate interactions between exhibited artefacts. This scheme applies to complex urban environments where historic layers and contested contemporary realities contribute to the experience of organic urban palimpsests. This paper addresses such an environment, the historic city of Nicosia, divided capital of Cyprus, and its Paphos Gate area in particular as an experiment in museology. According to this concept, the historic city, equated to an open-air learning environment/museum, is an assemblage of spatial nodes (an organism spatially expressed within physical boundaries *and* simultaneously a boundless mind space), and is comprised of a collection of interactions and material practices of cultural analysis, of deciphering, archiving and communicating knowledge.

This paper rethinks the differences between representing events (or artefacts from an archive) and presenting new events - which nevertheless stage historical situations and conditions: how museum visitors can "live" with the artefact, rather than simply "look" at it. Moving beyond the quantifiable aspects of immersion (clarity and richness of visuals and sound), the paper will discuss other factors that are experience-related and of qualitative nature, and thus difficult to be measured [2]. This discussion will focus on the potential of immersive environments to sustain the user's engagement beyond the short duration that typical e-learning applications are capable of. In this, participants' interest is maintained by utilizing cinema and gaming environments techniques.

Historic contested cities like Nicosia provide ideal contexts to probe the complexity and narrative of the urban experience [3]. The capital of Cyprus is considered amongst the most contested urban environments having historically layered pasts and perplexing present-day realities [4]. Physically divided between Greek and Turkish Cypriots, Nicosia, is a complex historic space where beneath the day-

to-day realities of the city lie both the separation as well as the memory of a shared past [5]. Nicosia's historic core remains enclosed behind iconic 16th century Venetian fortifications, a monument of key significance for the city's historic and spatial integrity [6]. Until the beginning of the 20th century, the city's gates defined the experience of urban space functioning as 'thresholds' separating urban from rural, outside from inside, safe from hostile, known from unknown and so on [7]. Among them, the Paphos gate, leading to the homonymous port-town, mirrors the layered utilitarian complexity of urban space. It served as barracks for the Ottoman and the British rulers of the island aiming at the control of this sensitive entryway. In the beginning of the 20th century the wall adjacent to the gate was demolished to allow the city's growth beyond the limits of its defensive enclosure. Since the 1974 war and the physical separation of the Nicosia, the Paphos gate has become an iconic symbol of division as it is virtually located on the infamous 'Green Line' that divides the city.

In this context, the gate offers a museum-like setting where the virtual re-staging of the gate's different historical phases (Figure 2) can help capture users' interaction with heritage and the narratives of collective memory. Furthermore, the experiential transformations of the built environment provoke changes in the perception of social and cultural identity. The case of Nicosia offers an instructive example of this selective process. Following the 1960's hostilities between Greek and Turkish Cypriots and the consolidation of the physical division of the city of Nicosia after the 1974 war, the once shared urban landscape of the historic core of the city became a contested frontline between two polarized communities. This divided reality filtered the daily experience of the city directly influencing the ways heritage was perceived and interpreted [8]. This selective perception was especially true in regards to monuments and sites associated with the community that now lived on the other side of the infamous Green line. Churches, monasteries, mosques, Ottoman public fountains were abandoned while streets and neighbourhoods changed names in an effort to rewrite the city's history and topography. Viewing the aforementioned urban reality as a museum setting, while using the proposed methodology, offers a new approach to learning through exploration.

2. INTERACTIVE SPATIALLY-DISTRIBUTED NARRATIVES AS A STRATEGY TO DECIFER THE URBAN PALIMPSEST OF NICOSIA

'Spectators who are active as interpreters, who try to invent their own translation in order to appropriate the story for themselves and make their own story out of it' [9].

The presented methodology focuses on the impact of navigating hybrid spaces, such as this of the virtual Paphos Gate presented below, on the participating individuals' condition. Inspired by the French philosopher Jacques Rancière's view of the active role of onlookers/observers during a performance, this paper is occupied with the extension of the interactive affordances of museum presentations beyond typical multimedia augmentation [10]. To do so it reframes the purpose of the performed presentations in the museum and understands these performances through *imagination, discovery* and *engagement*. This alternative approach to (performative) presentation is actualised through the use of an apparatus that facilitates the immersion of the visitors in new idiomatic and localized conditions and staged places [11].

In his book [12], Rancière suggested that educators should consider equality (in terms of *knowing* and *not knowing*) as a starting point rather than a destination. The presented methodology resonates Rancière's concept of the 'ignorant educator,' insofar as it is not interested in guiding visitors towards prescribed ends but rather in activating them to explore associated events towards multiple directions, starting from the same 'entry-point.' This paper discusses how such a framework enables the creation of spaces where the user is *in* the event related to the artefact, an event which can be new and not a re-enactment of the past, cf., [13]; [11].

To explore this framework (of the active role of the visitor) in practice, scenario-based design methods were studied. Director and theoretician Augusto Boal composed theatrical plays that depend on the intervention of the spectator, a performative action that engages the non-informed audience

into the pre-scripted narrative with uncertain effects. Performance-oriented discussions suggest that the process of combining pre-produced multimedia content with physical space, for 'user-intervention,' has perhaps not yet fully matured in the context of digital environments as much as it has in Boal's theatre [14]. The work presented hereafter was developed to contribute practical knowledge to this area, concerned with hybrid environments [15].

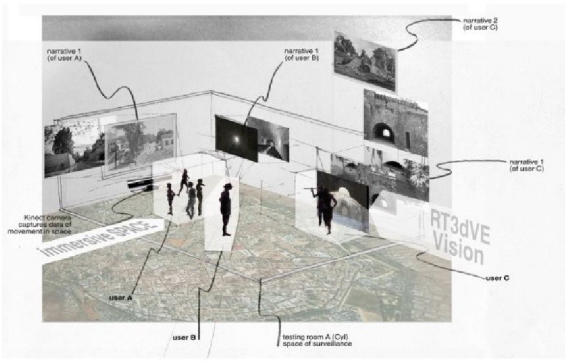

Figure 1: *Staging the virtual environment of the historic centre of Nicosia with the use of Oculus Rift goggles. This wearable head-mount display enables users to physically move their body in order to control its virtual representation during their visit of the projected environment of Nicosia's past and future realities. This way Oculus Rift goggles provide Real Time vision to the 3D Virtual Environment (RT3dVE).*

In the framework of urban environments like Nicosia, the application of new methods of learning through the exploration of virtual environments can be based on the emergent associations between the visitors' actions and the narratives projected. Visitors of such environments are able to navigate between several of the places presented by the story and to search for narrative content (triggered by their actions), thus relating visual perception and movement.

The construction of an interface that facilitates engagement but is 'invisible' (i.e., non intrusive and familiar) is required to enable visitors to inter-act [11]. To develop such an interface the relationship that users establish with the projected image-scape and the physical space should be explored. In doing so the research presented exploited the capacity of kinetic interaction interfaces for immersion.

2.1 THE FLANEUR AND THE GAMER *OR* WALKING THE CITY OF NICOSIA AS A GAME-PLAYER

Architects, archaeologists, heritage researchers and museum curators are nowadays able to simulate objects, buildings, even whole ancient cities in three-dimensional environments, and with precision [16]. Contemporary CAD animations are produced with the use of sophisticated rendering machines such as the *V-Ray*, *Maxwell Renderer*, *Indigo Renderer* and *LuxRenderer* which simulate the behaviour of light without approximations and thus can model accurately the characteristics of the simulated object/building. These rendering machines use mathematical equations to simulate perspective deformations (including 'shift lens' for architectural photography) and apply motion blur, depth of field and lens effects to the produced moving images, which now function as something more than merely an abstracted representation of the designed space [17].

Typical heritage simulations and visualizations stand poorly to the image quality of state-of-the-art video games and architectural renderings/animations. However, design educators suggest that interaction and precision are considered the most important characteristics of state-of-the-art use of the computer in the 3D design of objects, buildings and sites [18]. The impact of the visual qualities of a simulation on the continuous and sustained (inter)action of the user is of paramount importance, for the (re)creation of a place's atmosphere will engage the user/audience for longer periods of time.

Today the technological capacities for high-resolution acquisition of cultural and environmental data from the studied heritage site with the use of laser-scanners and GIS tooling, offers to researchers and scholars unprecedented access to a wealth of information. This paper suggests that besides using technology to represent – more often than not – reductive views of the past life of objects/sites of cultural heritage, research in the field should employ digital tools in order to present new events and conditions of the city to be explored, via the application of a new strategy. This strategy utilizes simulated environments as an observational and analytical tool to register and record dynamic data of

movement, a technique that enriches the typical, for museum installations, mono-dimensional aspect of the performances of the users in space (i.e., offered via the pre-scripted path of an animated walk-through).

This performative interface enables visitors of a heritage site or museum, in the case of the presented research, the environment of the Paphos gate in Nicosia, to virtually explore the territory of the presented monument, learn about its history, inquire about issues of accessibility (ease of access and expected / anticipated behaviour), and its cultural value. Immersed in this environment the visitors act as agents that explore projected narratives but also interact with each other on the virtual stage. The purpose of this journey is two-fold: while users educate themselves about the history of the building/ artefact, operators of the environment are able to collect data of movement and spatial behaviour (points of stasis, walking pace, orientation, points of interest, gaze, etc.) (Figure 3). This way the virtual environment of Paphos Gate will enable visitors to explore alternative past realities of the spatial organization of the monument, and at the same time will allow researchers and scholars involved to monitor the visitors' movement and behaviour in that space (Figure 1).

The challenges of this interdisciplinary study lie in: a) the degree of realism that the virtual construction of the simulated spaces exhibits, and b) the implementation of a natural and intuitive user interface that will enable the immersion of the users in the virtual environment. However, irrespective of the level of image quality, this experience can only become engaging via the employment of a 'good enough' interaction device for the user-interface (UI) that needs to be ubiquitous and non-obtrusive [19]. New Media specialist Seth Giddins in his article [20] claims that the common experience of digital game-play – as characterized by the loss of distinction between game, software, machine and player – brings us closer to crossing the threshold between the subject and object of experience, and makes the technology and the player interactants. Building on this, the presented research employed digital hardware interfaces originally developed for gameplay.

In the case of the virtual Paphos Gate in Nicosia, the incorporation of the stereoscopic vision of the *Oculus Rift*^{TM} goggles and the *Virtuix Omni* walking device (interactive treadmill), both of which were developed for digital games, allows the collection of metadata of circulation and bodily movement in the virtual space that is more descriptive of the users' spatial behaviour than data collected through typical controlling devices in virtual worlds (like keyboard, mouse, joystick, *SpacePilot*^{TM}, hand-gestures) since the former interface 'feels' more natural than the latter (Figure 2). Incorporating the interface in a full body interaction device with the real-time 3D virtual environment (e.g., *Rift* and *Omni*) assists in minimizing the impact of the UI on the decision making process of the user during the virtual visit of the environment and the less-than-typical mediated response to optical signals.

Figure 2: *Setting up and testing the 1st generation of interaction hardware at the Visualization Lab (Cyprus Institute).*

This instrumentation of the immersive environment facilitates the observation, the operation of minimally obstructed by technological mechanisms interaction, and consequently allows for more direct expression of bodily responses to external stimuli. This 'unmediated' (to the degree that is possible) interaction of the visitors with the environment is of paramount importance in order to achieve the level of immersion that is required for the analysis of the metadata of the users' spatial behaviour.

Immersed in this environment, visitors perform interactions through walking – in and around the site of Paphos Gate. Today in the 'age of vulnerability', the performance of walking with its associated lived experiences – i.e., experience of movement and stasis – provokes exploration and exercises decision making in uncertain situations of the

urban fabric. Bringing the practice of this kinaesthetic experience into the corporeal environment of staged virtual performances aspires to facilitate the emergence of a feeling of belonging and rootedness and the establishment of negotiations between multiplicities (of identity) towards the development of shared experiences and activities by the visitors of a museum - and consequently the users of challenged historic places [21] (Figure 6).

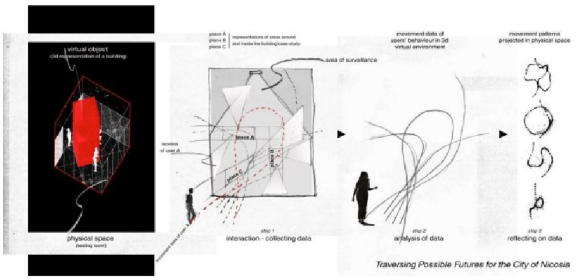

Figure 3: *Tracking bodily movement facilitates the analysis and mapping of public space occupation in the territory of the projected heritage site.*

2.2 DIGITAL METHODS OF STUDYING THE URBAN-SCAPE OF NICOSIA AS AN OPEN-AIR MUSEUM

The content of this methodology is developed through the use of advanced technological applications for the formulation of real-time virtual environments that stage historical and projective narratives in the urban space associated with cultural heritage. In the case of the Paphos gate in Nicosia, the presented research envisions that the user-interface developed will enable people's intuition to be communicated creatively via sophisticated data techniques. This process will allow researchers to test and evaluate hypotheses regarding the historical transformations of Nicosia's urban fabric.

In particular this research contributes to the development of innovative methods of visualizing information about the use of spaces such as:

- Cultural heritage, e.g., pilgrimage and sacred spaces;
- Architectural monuments and archaeological sites that have vanished or, were never completed due to historical events such as war, natural disasters, political interests and economic difficulties (Figure 5); and,
- Future spatial interventions on the urban terrain.

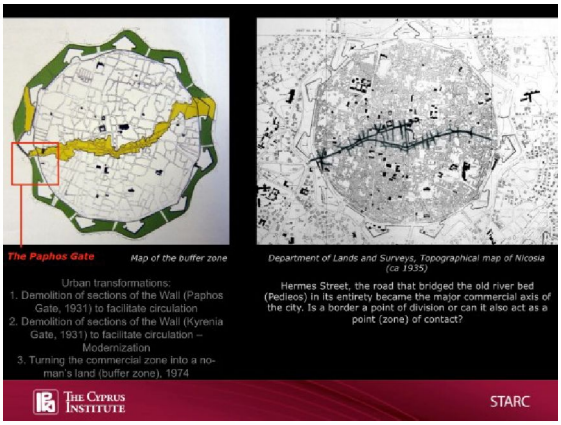

Figure 4: *Transformations of Nicosia's historic centre.*

This methodology facilitates the emergence of a new narrative flow between the new (projected future interventions in the urban-scape), the old and the *absent* (unbuilt, demolished or transformed) as the techniques discussed by the paper offer a parallel understanding of alternative urban conditions and capture uncertainties in spatial experience (in movement, in choice, in stasis, etc.). The digital techniques used to stage these simulated environments will, hopefully, enable us to understand how the position, scale, organization, form, proportions (of openings) and experiential aspects (i.e., light, material textures) of space, transfigured in time, impact the bodily movement of users of the particular space (e.g., walking pace, direction, points of stasis, points of interest) and thus the operation, use and occupation of this place.

The production of virtual space, populated by ambiguous constructions (e.g., found objects, remains and left-overs of buildings demolished, and historical artefacts) that invite users to explore and engage the digitally simulated environment can contribute to the creation of a digital platform for the study of the past that can also serve as a test-bed for projective interventions. When this virtual space progresses to its second phase as planned, and the interactive environment not only hosts reconstructions of historical buildings but also presents future interventions that are at the

stage of procurement, or under public discussion, then it will hopefully provide insights for the degree of integration that the planned works may have with the rest of the existing urban space – as well as information regarding their acceptance by the locals and visitors.

The synergy of virtual environments techniques with urban studies and architectural history can contribute to the development of cross-disciplinary projects that will enable holistic studies of contested urban space, and in particular historic cities and their future. Distinct from practices that work at a "bird's eye view" of urban dynamics [16], the methodology presented focuses on the micro-scale of the moving body on the performative stage of public space. Building on previous research on performative spaces for presentation and collaboration purposes [22], this project aims at the progressive development of:

- data visualization techniques (a factor which involves vision and therefore brings to the fore issues of representation and aesthetics - a qualitative parameter);
- the level of interaction (elaborated programming skills - a quantitative parameter); and,
- the dynamic associations between the kinetic aspects of the human-computer interface and the architectonic qualities of projected space (both involving articulated cognitive and kinaesthetic parameters).

Figure 5: *Point-cloud 3D model of (laser scanned) Nicosia's Venetian fortification (here, The Paphos Gate, situated on the infamous Green Line that divides the city since 1974).*

With the implementation of the presented methodology, the project's field of operation, the Paphos gate in Nicosia, is understood as a quasi-physical environment, a performative stage [23] that is suspended between the real-world materiality of the city and the *virtuality* [24] (i.e., the possibilities) of the digitally simulated terrain of historical and projective stages of the city. The users of this simulated environment are taking cues from the spatial organization and geometry of the physical space, as this is projected in the digital one. This "digitally staged' stimuli in turn motivates the spatial behaviour of the visitors and triggers their response by means of bodily movement, which is both physical (via the use of the *Oculus Rift*^{TM} kit) and projected in the simulated terrain of the place under study.

Digital technology offers new options to the study of heritage sites and their representation beyond the creation of pre-scripted artificial atmospheres. Users of hybrid spaces such as the virtual representation of the Paphos gate area can re-visit historical events and places, by means of responsive interfaces, to learn, through games embedded in the re-enacted situation, and observe virtual artefacts in museums or manipulate the projected environment.

2.3 OBJECT-ORIENTED STRATEGIES OF CREATING VIRTUAL LEARNING ENVIRONMENTS

'A baked clay vessel. Don't put it in the glass display case full of rare objects. It would show up badly. Its beauty is allied with the liquid it contains and the thirst it quenches. Its beauty is corporeal: I see it, touch it, smell it, hear it. If it is empty it must be filled; if it is full it must be emptied. I take it by the turned handle as I would take a woman by the arm... It is not an object to contemplate, but one for pouring something to drink' [25]. Octavio Paz criticizes the limiting - in terms of educational value and impact - practice of exhibiting craft objects and found artefacts of cultural heritage as art items in display. Transforming the Paphos gate area in Nicosia into a virtual environment for learning and education, as presented, relies on this form of interaction with the exhibited artefact that enables engagement and personal interpretation.

Instead of being confined to randomly re-editing pre-scripted sets of media (as in the case of typical multimedia installations that resort to human-computer interfaces for the representation of monument/artefact), the interaction system

developed at the Cyprus Institute attempts to establish dynamic connections between media content and free bodily movement in space. As individuals spend more time observing, relating, reflecting, figuring out riddles they engage with the various historical trajectories of the Paphos gate area. This entanglement of the users with emergent narratives of Nicosia's past and tokens of information (e.g., related to artefacts found by the archaeological excavation of part of Nicosia's moat adjacent to the Paphos gate) differs from typical methods of digital heritage presentation in a museum that are created via top-down activities of authorship (of the curator). Distinct from this typical curating strategy, this paper discusses an approach that facilitates a bottom-up view of historical events.

Enabling users of the multi-layered virtual environment of Nicosia to create unique, personal understandings of the exhibited material requires a different –dynamic –approach to the ontology of the collection of discovered objects and artefacts. Instead of presenting a curated outcome, which produces directed, linear narratives, the proposed view of virtual environments for learning, resorts to an assemblage which might contain artefacts of different historic periods – similarly to the palimpsest of historic Nicosia.

Learning from the development of the virtual Paphos gate this paper considers hereafter the extensive impact of the introduction of an object-oriented view to the production of interactive environments for learning and presentation purposes. Approaching a collection of artefacts found (e.g., unearthed through different layers of an excavation site) from an *object-oriented* view [26] allowed the creation of a dynamic digital environment that presents the complex experience of the Paphos gate area, and facilitates the emergence of *spontaneous order* [27]. The concept of spontaneous order was first used by the economist Friederich A. Hayek to describe the production of 'unplanned social order by goal-directed individual action' [28]. Distinct from its purpose to describe political orders and Hayek's efforts to contrast it with rational constructivism (that imposes order through top-down planning), the concept of spontaneous order is borrowed here for its ontological definition. That is, because it 'promotes cooperation without central direction by enabling individuals to coordinate their actions through […] cultural rules. Because spontaneous order is the by-product of individuals' decisions, it is end independent; that is, it aims toward no collective goal or outcome' [29].

Technology-augmented strategies of cultural heritage presentation draw from information exchange and social interaction systems. In this context, the spontaneous emergence of personal narratives towards multiple directions, rather than a predefined end (i.e., the same, 'static' knowledge offered to different museum visitors), facilitates the application of interactive spatially-distributed narratives as a strategy to present and understand the urban palimpsest of Nicosia.

Moving away from the issues associated with the organization of the digital environment of the virtual Paphos gate, as discussed above, this paper looks at methods of interaction applied in the development of this environment, and discusses the potential of bottom-up operating methods for structuring its inherent narrative. Resonating with the Italian philosopher Gianni Vattimo's concepts of *weak ontology* and *fragile thought*, the research presented proposes a new methodology for understanding an object by direct experience [30]. Forming (virtual) entanglements of objects or objects and users enables the ephemeral stabilisation of alternative/unique assemblages (of collections, narratives, activities, museum-visit partners, contents, encounters, practices, participations, etc.) that catalyse the visit of the heritage site/exhibition into an experience of engaging with a field of multiple *contemporary* constructions. The understanding of the constructions that populate these hybrid spaces as ephemeral and contemporary diverges from the view that associates the authorship of the expert (historian, archaeologist, architect, curator) with only one narrative to portray the historical events to-be-presented.

This approach acknowledges the interpretation of the expert author during the discovery or presentation of heritage as a contemporary event – an activity that takes place today and not at the time of the object's creation. One is able to express and develop only a partial –'superficial,' like the surface of an excavation site – interpretation of the

corporeality of historical events, as s/he has limited access to the complexity of the production of cultural artefacts. This limitation arguably stems from the fact that these artefacts form a punctuated collection of objects that lies outside the historical continuum that produced them.

3. CONCLUSION

The presented research addresses the fragmented views of historical continuum that characterize Nicosia's historic center and consequently the area around the Paphos gate. In doing so, this paper illustrates technological interfaces that promote the concept of the indeterminate emergence of narratives, borrowed from performance theory. In the interactive environment of the virtual Paphos gate divergent constructions emanate from the unpredictable conditions of each visit (e.g., particular narrative/path the user followed in the museum, mood, other users sharing the space, etc.). They reveal more than the functional relationships of parts (e.g., artefacts) and whole (e.g., exhibition narrative) typical educational environments explore. Specifically the presented digital methodology allows the assembly, disassembly and reassembly of the volatile relationships of friction and conflict that characterize most cultural heritage sites.

The proposed analysis of the Paphos gate environment envisions the next step in the evolution of the contemporary visitor-centred site experience via the application of an 'interactive spatially-organized narrative' as a method of knowledge seeking and site exploration. The performative qualities of enacting, way finding and flaneurism, permit users' to creatively respond to the presented variables of space- and time frame for the exhibited space and artefacts. In the light of current rapidly changing techno-social circumstances this research is concerned with an experimental responsive apparatus that functions as a locus for mapping uncertain patterns of interpretation and interaction. This way, a heritage/museum environment becomes a network of 'things' [31] (a collection of seamlessly interacting 'attractors' and 'repelling' points of human activity).

This new strategy of object-centred organization aims at evoking rather than documenting the essence of a heritage/ museum context, e.g., transfer of knowledge, discovery and learning about a particular subject – in the case of the presented study, the history of the Paphos gate. However it should be noted that this research explores how interactive digital media can be used not as a substitute for the physical visit to Nicosia's famous gate, but to supplement and extend the immediacy of the lived experience of walking the city. Theoretical consideration and practical knowledge were offered to highlight digital methods of augmenting the experience of the users by bringing together physical and virtual forms of information. This was done in order to engage new audiences, and reveal aspects of cultural heritage not readily apparent from the remains of the Paphos gate observed through an 'objective' lens of separation.

In conclusion, this paper proposed the synthesis of digital visualization techniques, advanced interaction technologies and object-oriented strategies, in order to offer new perspectives for the establishment of a curatorial framework that promotes *reconnaissance* rather than transmitting predetermined knowledge. This approach promotes a major change in the way we conceive, design and present heritage and museum environments. Instead of providing pre-framed views, the proposed methodology enables creators to setup original points of interest that provoke interaction and generate non-prescribed actions and events.

4. ACKNOWLEDGMENTS

Georgios Artopoulos, Nikolas Bakirtzis with Sorin Hermon, Jens Wiegand, Ropertos Georgiou, Giancarlo Iannone, Danai Konstantinidou and Marina Faka (The Cyprus Institute, Science and Technology in Archaeology Research Center) & Marina Solomidou-Ieronymidou and Polina Christofi (Department of Antiquities); Agni Petridou and Athina Papadopoulou (Nicosia Municipality) & Donna J Cox, Kenton Guadron McHenry, Bob Patterson, AJ Christensen and Stuart Levy (University of Illinois-Urbana Champaign, National Center for Supercomputing Applications).

5. REFERENCES

[1] Assemblage theory understands the relations among the parts as being contingent, and not necessary. Within

such a structure, parts can be removed from one whole and introduced into another whole. 'These relations imply […] that a component part of an assemblage may be detached from it and plugged into a different assemblage in which its interactions are different. In other words, the exteriority of relations implies a certain autonomy for the terms they relate' DeLanda, Manuel, *A New Philosophy of Society: Assemblage Theory and Social Complexity* (Bloomsbury Academic, 2006), pp. 10-11. Cf. Deleuze, G. and Guattari, F.: *A Thousand Plateaus: Capitalism and Schizophrenia* (Continuum International, 2004).

[2] Thomas, Maureen, François Penz, Brian Ashbee, and Terence Wright, eds. 2002. *Converging Traditions in the Digital Moving Image: Architectures of Illusion, Images of Truth.* Bristol, UK: Intellect Ltd.

[3] Tackling issues of memory, place and conflict in the historic city of Nicosia, cf. Bakshi, A., 'Memory and Place in Divided Nicosia,' *Spectrum Journal of Global Studies,* vol. 3, no. 4, pp. 27-40, 2011.

[4] Petridou, A., 'Nicosia: Perspectives for Urban Rehabilitation,' *Journal of Mediterranean Studies*, vol. 8, no. 2, pp. 350-64.

[5] G. Artopoulos and N. Bakirtzis, 'Virtual Environments of Contested Urban Space: Mapping the Spatial Experience of Heritage in Divided Historic Cities,' in G. Cairns (ed). The Mediated City. *Architecture_MPS Journal*, London, UK (2014).

[6] Cf. Michaelides, Dimitris (ed.), *Historic Nicosia* (Nicosia: Rimal Publications, 2012).

[7] For a discussion of the ways fortifications were experienced and perceived in the medieval period in Byzantium, cf. Bakirtzis, Nikolas, 'The Practice, Perception and Experience of Byzantine Fortification,' *The Byzantine World*, ed. Paul Stephenson (Routledge: London and New York, 2010), pp. 352-70.

[8] On the Green Line and the ways it has affected Nicosia, cf. Gumpert G. and Drucker, S., 'The Green Line: Impact and Change in Nicosia,' *Journal of Mediterranean Studies*, 8, (2), pp. 205-22.

[9] Rancière, Jacques, *The Emancipated Spectator* (2004), p. 11.

[10] McManus, Paulette, 'Topics in museums and science education,' in *Studies in Science Education,* vol. 22 (1992), pp. 157-82.

[11] Artopoulos, G. and Condorcet, E.: "House of Affects – Time, immersion and play in digital design for spatially experienced interactive narrative," *Digital Creativity Journal*, vol. 17, no. 4, pp. 213-20, 2006.

[12] Rancière, J., *The Ignorant Schoolmaster: Five Lessons in Intellectual Emancipation* (1991).

[13] Artopoulos, G., 'Prototype Spatial Models of Interaction,' in peer-reviewed *International Journal Of Visual Design,* CG Publishers, Vol. 6 (3) (ISSN 1833-1874), 2012, pp. 39-56.

[14] Rebelo, P., *Performing Space*, Organised Sound, Vol. 8.2 (Cambridge: Cambridge University Press, 2003), p. 3.

[15] Young, M. R., and Riedl, M., 'Towards an Architecture for Intelligent Control of Narrative in Interactive Virtual Worlds,' in *UIU 2003, International Conference on Intelligent User Interfaces.* Miami.

[16] Cf. Kolarevic, B., *Architecture in the Digital Age* (Spon Press, 2003).

[17] Cf. Alex Roman's *The Third & the Seventh* (2010).

[18] Cf. *European Association for Architectural Education*, 2008.

[19] G. Artopoulos and E. Condorcet, 'House of Affects,' in *14th International Symposium on Electronic Art*, ed. by Ingrid Maria Hoofd, Margaret Tan and Katharine Ho Kit Ying (Singapore: ISEA, 2008), pp. 37-39.

[20] Giddins, Seth, 'Playing with non-humans: digital games as technocultural form,' in Proceedings of *DiGRA 2005 Conference: Changing Views – Worlds in Play* (2005) [http://www.dcrc.org.uk/wp-content/uploads/2013/08/PlayingWithNonHumans_Giddings.pdf].

[21] Malone, Karen, 'Street life: youth, culture and competing uses of public space,' *Environment and Urbanization,* 14 (2002), p. 157.

[22] Nitsche, M. and Richens, P., 'Telling Stories through Space: The Mindstage Project,' in Goebel, S., Malkewitz, R. and Iurgel, I., eds. *Technologies for interactive storytelling and entertainment* (TIDSE Berlin / Heidelberg: Springer, 2006), pp. 61-71.

[23] Cf. Haseman, Brad, 'A Manifesto for Performative Research,' in *Media International Australia incorporating Culture and Policy,* theme issue of *'Practice-led Research,'* 118 (2006), pp. 98-106. The

goal of the presented research is not to merely represent the completed built environment that was in the past but to set up conditions for the emergence of meaning. The virtual environment does not try to be useful as a representation tool for the museum. Rather, its meanings emerge as a story of tensions: between the perfect completeness of the digital model and the untidy, complex multiplicities of the physical, between Greek-Cypriots and Turkish-Cypriots, between political decisions (top-down control) and the messiness of the everyday life (bottom-up irregularities).

[24] 'Virtuality' here refers to the potential of each version of the represented space to host spatially distributed events and to be occupied by specific users, and therefore it characterizes the possibility of every computationally simulated space to provoke particular activities by its users.

[25] Paz, Octavio, 'Seeing & Using: Art & Craftsmanship,' in O. Paz, *Convergences: Essays on Art and Literature* (HBJ: New York, 1987), pp. 50-51.

[26] 'Object-Oriented Ontology (OOO): A genus consisting of ontologies that argue that being is composed of objects. OOO is *not* the thesis that we should focus on objects instead of humans, but rather that there's only *one* ontological category, objects, which also includes humans, i.e., there aren't two distinct ontological domains, one composed of mind, the other composed of natural objects' http://larvalsubjects.wordpress.com/2010/05/22/a-lexicon-of-onticology/. Cf. Bennett, Jane, *Vibrant matter: a political ecology of things* (Durham, North Carolina: Duke University Press, 2010).

[27] Mandeville, Bernard, *The Fable of the Bees or Private Vices, Publick Benefits, Vol. 1* (1732). Online < http://oll.libertyfund.org/titles/mandeville-the-fable-of-the-bees-or-private-vices-publick-benefits-vol-1> accessed: 10 September 2014.

[28] Boykin, Scott A., *The Independent Review*, v. 15, n. 1, Summer 2010, ISSN 1086–1653 (2010), p. 19.

[29] Ibid., p. 21.

[30] Vattimo, Gianni, *The End of Modernity* (1985) (John Hopkins University press, Baltimore, 1991).

[31] Cf. Latour, Bruno, 'From Realpolitik to Dingpolitik – An Introduction to Making Things Public,' in Bruno Latour & Peter Weibel, eds., Making Things Public-Atmospheres of Democracy catalogue of the show at ZKM (MIT Press, 2005).