Interdisciplinarity in Byzantine Studies
A Sacred-Landscapes and Digital-Humanities Approach

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Abstract   This contribution aims at investigating the application of theoretical and digital approaches to the 'sacred'. Apart from highlighting the potential of spatial analyses and other computational approaches in Byzantine Archaeology, this paper explores issues of reception and appropriation of the Byzantine past in our contemporary world through the employment of state-of-the-art digital tools, Neurosciences and the practice of Community Archaeology. The constructive application of digital technologies and the smart incorporation of archaeological and anthropological theory expands into innovative directions in the field of Byzantine Studies.

Keywords   Sacred landscapes. Sacred spaces. Digital humanities. Byzantine archaeology. Spatial analysis.

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1   Introduction

Landscape studies have evolved into a significant branch of historical archaeological research in the last four decades, by placing emphasis on the ecological, economic, political and cultural values of premodern landscapes. Ever since spatial analysis entered the field of New Archaeology, archaeologists, historians, anthropologists, and geographers – working together – have been trying to explain, for example, how and why complex settlement systems developed in the landscape (Hodder, Orton 1976; Clarke 1977; Cavanagh et al. 2002; Bintliff, Howard, Snodgrass 2007). Even more interestingly, the study of 'sacred' landscapes and spaces has by now become another prominent field of landscape research, mainly in Northwest Europe and North America, by paying attention to the ideational dimensions of sacred mountains and hills, burial monuments and grave markers, sanctuaries, temples, and churches (Turner 2006; Bis-Worch, Theune 2017; Bielmann, Thomas 2018).

When it comes to the Christian era and the Byzantine landscapes of the Eastern Mediterranean, monumental/urban and humble/rural churches constitute one of the main elements through which one may explore sacred space, ritual practice and religious identities and/or affiliation (Vionis 2019; Vionis, Papantoniou 2019). A number of relatively recent publications have focussed on early Christian monumental basilica churches of the fifth and sixth centuries as powerful expressions of Christian ideology in the process of Christianising the Early Byzantine landscapes and townscapes of the Eastern Mediterranean (Caseau 2001; Sweetman 2010; Vionis 2017a; Vionis, Papantoniou 2017; Kyriakou 2019). For example, the prominent siting of Early Byzantine Christian basilicas, as well as Middle and Late Byzantine chapels and monasteries, was intended to dominate the religious skyline of cities, villages and their immediate countryside, in the same way that pagan sanctuaries on mountain tops and other prominent sites had done in the past (Caseau 2004; Vionis 2017a). On the other hand, there are diverse ways one can interpret the distribution of Byzantine churches, such as the spread of Christianity, pilgrimage, trade and network connections (Sweetman 2017; Vionis 2017a; Vionis, Papantoniou 2017; Kyriakou 2019; Keane 2021; Perdiki 2021).

Similarly, the field of Digital Humanities has grown into a discipline of its own, engaging, in most cases, into a productive dialogue between disciplines (cf. Papantoniou et al. 2019a). It evolved through several genealogies of approaches, previously known as 'humanities computing', 'humanist informatics' or 'digital resources in the humanities', providing a platform for the dialogue between the Humanities and computer applications (Nyhan, Terras, Vanhoutte 2013, 1-5; Neilson, Levenberg, Rheams 2018, 1-4). Living in a digital age, usually referred to as 'information era', within which the pres-

ervation of human values has become of utmost importance (Keen 2018), this fusion between social sciences and computational methods/mathematics was unavoidable (Le Deuff 2018). This process led to the convergence of new computational techniques and visualisation technologies in the Arts and Humanities, and to the development of fresh approaches to the study of new as well as traditional corpora (Berry 2012).

The employment of digital tools and approaches to sacred landscapes and ritual space has seen tremendous growth recently in both archaeological and historical research across periods and geographical regions (cf. Papantoniou et al. 2019a; Popović et al. 2019; Häussler, Chiai 2020). Geographic Information Systems (GIS), remote sensing (geophysical prospection, LiDAR) and 3D modelling have now become (almost) a standard tool for exploring sacred spaces and landscapes. The mapping of Cypro-Archaic and Cypro-Classical sanctuaries and the applicability of GIS approaches on sacred landscapes in Cyprus, for example, has revealed that extra-urban shrines created rings of sites demarcating the various ancient polities (Papantoniou, Kyriakou 2018). The investigation of princely sites, burial and ceremonial features in their landscape context around the Early Celtic hillfort of the Glauberg in Germany, with the aid of viewshed analysis and remote sensing, have revealed the multi-layered meaning of such landscapes, both as places of social meaning and as a transitional zone between the living and the dead (Posluschny, Beusing 2019). Another characteristic case from Early Medieval Bavaria has illustrated how the digitisation of churches combined with historical research can contribute to the reconstruction of diocesan borders and the 'topography of power' (Winckler 2019).

GIS and digital approaches to sacred space feature also in studies on Byzantine landscapes. Various spatial analyses, combined with historical and archaeological evidence, have shown that Early Byzantine basilicas functioned as a conceptual 'boundary' or 'territorial markers' between bishoprics/towns in central Greece, the Aegean islands and Cyprus, served as symbols of community ownership and comprised local 'central places' of production and economic activities within their respective micro-regions (Vionis 2017a; Vionis, Papantoniou 2017). Similar approaches employed to examine the distribution of religious structures on the islands of Naxos and Cyprus in the Middle-Late Byzantine era have produced important results regarding the role of rural churches as markers of settlement under divine protection, spaces to bury the dead and promote memory, and 'liminal' zones defining community or monastic properties (Vionis 2019).

Acknowledging that the interdisciplinary study of religious spaces and sacred topography transcends the boundaries of time and space, this contribution aims at investigating the application of theoretical and digital approaches to the 'sacred' through numerous published

case studies. Apart from highlighting the potential of spatial analyses and other computational approaches in Byzantine Archaeology, this contribution attempts, for the first time, to explore issues of reception and appropriation of the Byzantine past in our contemporary world through the employment of state-of-the-art digital tools, Neurosciences and the practice of Community Archaeology. The constructive application of digital technologies and the smart incorporation of archaeological and anthropological theory expands into innovative directions in the field of Byzantine Studies, delving into issues of 'who owns the Byzantine past' and 'how ethnic, cultural and religious identities clash or interact harmoniously'.

2 Understanding Byzantine Ritual and Sacred Space

The turnaround of politico-economic factors and the manifestation of the 'sacred' seem to have played a pivotal role in the expression of power and ideology, shaping settled and sacred landscapes accordingly, as well as determining settlement recovery and resettlement of abandoned or semi-abandoned microregions. The term 'sacred landscapes' has been chosen in acknowledgement of the inspiration provided by the published work of Susan Alcock (2001; Papantoniou, Vionis 2017). Alcock used this term in her examination of sacred landscapes in the Greco-Roman world, illustrating that the relationship between religion, politics, identity and memory was more intimate and more involved than had often been assumed (Papantoniou 2012, 77).

Material evidence allows us to identify sacred spaces in a given place and to reconstruct natural and cultural features endowed with religious meaning. In order to evaluate religion and forms of *interpretatio religiosa*, it is important to question where the 'secular' and the 'numinous' begin and end, whether the distinction is relevant, and that it may be impossible to isolate the numinous from its sociocultural norms as expressed in materialities (Papantoniou, Vionis 2020, 85-6). In Byzantine times, for example, a church was not simply a 'sacred space' or a symbolic expression of Christian piety. Depending on their contexts, churches functioned in a variety of ways: as monastic churches, episcopal and 'parish' churches, cemetery churches, private and burial chapels (Gerstel 1998, 93-6; Kalas 2009, 79; Vionis 2017a). Their architectural, decorative, archaeological and topographical parameters need to be taken into account in order to contextualise their meaning, ideational or other, and comprehend whether one can distinguish between 'sacred' and 'profane' or how 'profane' space was converted into a 'sacred' one in the landscape.

Additionally, senses such as the view of painted icons, the hearing of processional prayers, the movement of sound or the smell of

incense and other sensory experiences (e.g. the *proskynēsis*, i.e. kissing/venerating icons) cannot be ignored in a holistic approach to Byzantine sacred space (Lidov 2006, 32-3; Dale 2010, 406; Caseau 2013, 76; Antonopoulos et al. 2017, 322). In the domain of living religion especially, such as in Eastern Orthodox Christianity, the bodily senses play an essential role in understanding the nature of religious experience (Morgan 2010). For example, during the cult tradition of the *Epitaphios* on Good Friday since the thirteenth-fourteenth century, when the *Epitaphios* cloth started being used in the commemorative ritual procession (Ćurčić 1991, 252), sensory and experiential engagement includes the viewing of Christ's body, the *proskynēsis*, the touching of the *Epitaphios* (the portable domed bier representing the tomb), the hearing of processional prayers, the smell of incense and decorative garlands (Papantoniou, Vionis 2020, 90).

As noted above, churches functioned in a variety of ways; thus, one can explore their particular location and meaning in the landscape through various means. Sharon Gerstel has previously suggested that churches dedicated to Saints and the Virgin were constructed in towns and villages, functioned as 'parish' churches and were perceived as the spiritual, architectural and social centre of settlement communities (Gerstel 2005, 166). In a different topographical setting, Veronica Kalas (2009, 90) has seen outlying chapels in tenth-eleventh century Cappadocia as a protective sacred barrier between the outside and inside worlds of the inhabitants. Churches of the period of Latin domination in the thirteenth-fifteenth centuries, located in close proximity to arable fields belonging to small landowners, have also been seen as markers of important resources and property ownership or as entry points to geographical units, like the cases discussed by Lucia Nixon (2006, 23-6) in Crete, or Jim Crow and his collaborators (Crow, Turner, Vionis 2011, 130-2) in Naxos.

The sacred, however, does not simply take shape through the construction of churches as religious monuments. Movement and kinetic rituals (e.g. pilgrimage, religious processions) in the streets of a town, or in footpaths in the countryside, involve the engagement of the faithful with the magnetic power of a landscape or townscape (Eade 2020), charging it with sacred meaning and confirming the sacred dimension of a network of interlinked religious sites/monuments through time (Vionis 2022). By employing a spatiotemporal analysis of religious processions in Constantinople's streets, a fascinating study by Vicky Manolopoulou (2019) explores how the city's roads functioned as sites for ritual activity and how the faithful participated in the re-enactment and commemoration of saints by preserving social memory and shaping the relationship between people and sacred townscapes. In a similar manner, the example of the *Epitaphios* ritual procession noted above incorporates concepts of re-enactment, remembrance and commemoration (Papantoniou, Vionis

2020, 91). Although it is true that there is a long theological debate on the issue of 'mimesis', 'non-mimesis', 'enactment' and 'metamorphosis' (Krueger 2014, 7, 221; Walker White 2015, 5, 25), we cannot ignore that the re-enactment of Christ's passion and entombment in the procession of the *Epitaphios* on Good Friday stages a commemoration or creates the space for memory and sanctification. Constructed sacred landscapes, the sight of sacred relics, the hearing of liturgical prayers, movement within sacred spaces and participation in ritual processions and practices undoubtedly functioned also as agents of metaphorical healing. Recent developments and the expanding field of the science of neurotheology or spiritual neuroscience, suggest that the brain responds in specific ways to meditative and contemplative healing practices (Newberg 2010; 2014).

3 Digital Humanities and Spatial Approaches to Sacred Landscapes

By moving the emphasis from 'computing' to 'humanities', the creative possibilities of digital technologies can now be summoned to strengthen the capacity of studying, analysing, visualising and interpreting a range of cultural material and practices, through the making of virtual worlds, mapping and geospatial analysis, graphical and network analysis (Schreibman, Siemens, Unsworth 2016; Levenberg, Neilson, Rheams 2018; Flanders, Jannidis 2019). In this respect, one could argue that we are gradually moving towards a Digital Cultural Heritage era. This does not mean we can transform into purely 'digital scientists' solely by bringing cultural heritage experiences into the public domain, be that cultural atlases, museum collections and digital archives (Kenderine 2016, 22-4). Essentially, we remain what we are by discipline (even if this is also disputed today due to the interdisciplinary nature of most of our fields), by providing an 'alter-ego' in our research and by performing an interactive narrative and encompassing embodiment and digital analyses through cultural heritage visualisation.

3.1 The Spatiality of Sacred Places

Nowadays, various GIS analyses (e.g. viewshed, cost-surface and least cost path) comprise a useful means for exploring the spatiality of sacred and domestic sites (i.e. the hierarchical arrangement of sites) and their relation with topography and the environment, social and economic variables. Apart from the examples mentioned in the opening introduction of this contribution, we could also draw on the case study from the region of Tanagra in Boeotia (central Greece),

one of the first cases concerned with spatial/digital analyses and site choice in the Byzantine era, the distribution and the secular and sacred dimension of churches. GIS analyses, in combination with archaeological evidence for settlement activity in the area of Tanagra, have revealed the pattern of settlement hierarchy and how village-community 'territorial boundaries' were formed under the protection of the 'sacred' (Vionis 2017b, 166-8).

More specifically, intensive archaeological field survey in the region of Tanagra in 2000-05 by the *Leiden-Ljubljana Ancient Cities of Boeotia Project* in central Greece has revealed a network of rural settlement sites in the immediate territory of the ancient city-site of Tanagra. The network of Middle Byzantine settlements of the eleventh-twelfth centuries comprises two mega-villages, four hamlets and two farms. They are spaced at almost equal distances, with small churches (most of them of Byzantine date) dominating each site and marking past cultic and other human activities. Two of the largest settlements, Agios Dimitrios on the southern hills of Tanagra and Agios Thomas in the Asopos valley, must have functioned as the main villages of the region, with minor settlements scattered around. The results of GIS analyses applied in the case of the Middle Byzantine settlements in the region to identify settlement hierarchy, inter-site relationships, and village-community territorial boundaries are revealing. According to cost-surface analysis, the distance between neighbouring major and minor settlement is such that it would take between 5 and 15 minutes to go from one to the other. Notably, agricultural land around each settlement is sufficient to feed the population and provide a surplus for export. Furthermore, viewshed analysis confirmed that visibility from each main settlement (or mega-village), that is, Agios Thomas in the valley and Agios Dimitrios on the southern hills, is restricted to its respective territories and satellite settlements. This pattern, with churches marking the focus of each settlement and functioning as the cult-place for each community, illustrates not only site-hierarchy and the organisation of Byzantine space as pictured in the *Marciana Fiscal Treatise* (Ashburner 2015), but also points to the rural church as the focus of village/rural social and spiritual life (cf. Vionis 2020).

In another context, spatial analyses have revealed the multiple role of sacred monuments in the landscape. More than 50 churches, built or decorated with layers of fresco in the Middle and Late Byzantine/Latin periods, are located in the inland valleys of Drymalia, Sangri and Potamia in Naxos, where GIS analyses visualise and provide further insights regarding their distribution and role (Vionis 2019, 76-9). Twenty-six of them are located at sites with evidence for settlement activity, 14 are associated with burial, as suggested by their fresco decoration and/or the existence of arcosol tombs, while the remaining very possibly functioned as 'liminal' or outlying chapels. The val-

leys of Drymalia and Sangri are particularly fertile and have always attracted settlement and intensive cultivation; olive trees now occupy a vast part of the area, while documentary records suggest this has been the case at least since the seventeenth century (Kasdagli 1999, 37-9; Crow, Turner, Vionis 2011, 125).

Archaeological evidence for settlement activity, deriving from extensive archaeological surface survey in the valleys of Drymalia and Sangri in Naxos, has revealed that some of the churches are associated with a settlement and/or a cemetery, while others with neither. One large settlement, associated with Panagia Protothrone at Chalki, is identified as the town of Middle Byzantine Naxos. The concentration of smaller rural settlements-sites in Drymalia, Sangri and Potamia, identified as hamlets, follow a pattern equivalent to that of church-concentrations in the three valleys under investigation. Cost-surface analysis further visualises the clustering of settlement sites in groups, as we saw in the case of Boeotia above. Thus, groups of minor settlements at small distances from each other seem to form a single village-community under the protection of holy powers, with churches in close proximity, signifying the sites' spiritual and social centre and providing sacred space for the communities' Sunday prayer, as well as burial. All village communities on the island saw the main and largest settlement at Chalki as their shared administrative and ecclesiastical centre and market town (Vionis 2019, 76).

What is most interesting in the case of Naxos is the specific topographic location of a number of churches, the function of which cannot be identified as parish or funerary (due to the lack of archaeological evidence for settlement activity and/or the lack of iconographic references to their funerary character). A number of these churches are located higher up, on hills surrounding the central valley of Drymalia to its north and east, forming a continuous line. Viewshed analysis shows that this network of sacred monuments overlooks the concentration of settlement sites, parish and funerary churches in the valley floor, forming a conceptual 'boundary' or zone around this community. Similar conclusions have been drawn in the case of the Late Byzantine Peloponnese, where Gerstel (2013, 337, 362-8) has identified, on the basis of painted inscriptions and other documentary evidence, that a large number of 'satellite' chapels and distinctive topographical features (ravines, consecrated caves, rivers and mountains) marked territorial borders that were simultaneously sacred, agricultural, fiscal and personal. Thus, it would seem logical to suggest that these humble isolated ecclesiastical monuments in inland Naxos can be identified as 'liminal' churches, honouring saints and the Virgin, sanctifying the landscapes in the periphery of each inhabited area, providing a landscape mark between settled or agrarian spaces and barren or pastoral grounds, as well as conceptually defining community space (Vionis 2019, 78).

In the context of 'centrality' and 'liminality' of sacred places and landscapes, another fascinating example is provided by Hamish Forbes (2007, 372) for the Methana peninsula in the Peloponnese, probably reflecting diachronic phenomena. There, extramural churches in faraway locations and on 'neutral' ground formed strategic meeting places for family and friends from different villages. The annual celebrations at those churches provided the means by which different communities have been able to express their pan-peninsular identity. In this landscape, therefore, it was not nucleated communities which have become 'central places'; rather, it was these isolated structures in the apparently 'empty' countryside.

3.2 Viewing, Hearing, Experiencing

Next to monumental ecclesiastical architecture and the significance of 'sanctifying' landscapes during the Byzantine period, visual imagery (e.g. the 'iconographic programme' and portraits of benefactors) intended not only to commemorate and praise patrons and/or the emperor, but also to communicate religious meanings to the viewers, setting the visual framework of the liturgical performance (Thomas 2018, 72). The links between architecture and liturgy, and the painted programme and liturgy, especially between the late seventh and twelfth centuries, when a new form of ecclesiastical architecture crystallised (i.e. the cross-in-square church-type with dome) and the iconographic programme illustrated the words of the liturgy, became particularly strong, creating a 'sacred space' for collective worship on special occasions (Yasin 2009, 15). Painted images and narrative scenes (e.g. wall frescoes and portable icons) act as mediators of the divine according to Aristotelian logic and Christian theology (Walker White 2015, 43; Gamberi 2017, 212-17) and provide lessons for the faithful who may view through Christ's and the martyrs' passion their own misfortunes and daily struggles (Gerstel 1999, 78).

Despite the fact that special features in Byzantine architecture remain recognisably 'global', as suggested by Robert Ousterhout (2010, 87), certain architectural details reflect the local or regional character of ecclesiastical monumental buildings and comprise examples of regional expression and local ritual practices. The church building itself, through its architectural arrangement in its various regional variations, became more than a shell for ritual, acquiring a specific 'function' in Byzantine and later Medieval society. The saintly and angelic figures depicted on its walls, on the other hand, became participants in ritual performances along with the congregants, alluding to liturgical aspects of the interior architectural space (Marinis 2014, 355-6; Antonopoulos et al. 2017, 334). It is fascinating that contemporary methods and digital tools provide the means through which we

can explore aspects of visibility, hearing and ritual movement within such sacred spaces.

Some relatively early attempts at exploring visibility and experiencing Byzantine sacred spaces were materialised through the application of 'space syntax' and 'visibility analysis' in Late Antique-Early Byzantine monuments, such as basilica churches in Jordan (Chatford Clark 2007) and San Vitale in Ravenna (Paliou, Knight 2013). Considering that sacred space comprised efficacious space, the articulation of religious buildings or building complexes was such as to protect the holiest of its corners from 'trespassing', visual or other 'pollution' by establishing certain symbolic or physical boundaries (cf. Eliade 1987). In the case of the Byzantine churches in Jordan, computational methods, such as space syntax, known as isovist and visibility graph analysis, were employed to examine spaciousness, openness, and complexity (from certain spots in the interior of the churches) for six building types. The aim was to identify the degree of visual integration and potential changes in the ritual, as well as the relationship between clergy and congregants (Chatford Clark 2007, 101-2). Aiming at the investigation of human sensory engagement with sacred spaces, the study of San Vitale, where isovist analysis was executed, comprises a case study with interesting observations, such as gender division within the building and men's privileged visual access to the performed ritual over women (Paliou, Knight 2013, 234-5), despite the limitations faced when dealing with two-storey buildings (Thomas 2018, 70-2). The visual and structural exploration of sacred buildings with the aid of computational methods, such as visibility and access analyses, and 3D reconstruction/modelling, especially in cases where the type of monuments explored do not survive intact (e.g. early Byzantine basilicas), provides a unique means of sensorial experience and perception of the sacred in the Byzantine past. Navigating our body and brain through a sensory experience in a real or virtual/reconstructed space, we may reach "a better understanding of the human experience of spirituality and religion" (Newberg 2014, 4).

Viewing the interior of sacred spaces seems not sufficient. The application of new information technologies, namely 3D auralisation and archaeoacoustics, to unlock the sound of religious buildings and appreciate or even live the experience of the Byzantine liturgy in a similar way the faithful experienced the Orthodox service in the Middle Ages, comprises a new and innovative field of research. The exploration of the acoustics in Byzantine/Medieval churches has revealed that "the overall conspicuous and sensorial impact of the interior communicates centrality and cohesion" (Tronchin, Knight 2016, 143) in the sixth-century octagonal basilica of San Vitale, and the ways that "the faithful could hear the angels depicted on the domes, fluttering and chanting above them" (Gerstel et al. 2021, 49) in Thessaloniki's Late Byzantine churches.

Combining textual references with monumental paintings, inscriptions and acoustical measurements, the *Soundscapes of Byzantium* multidisciplinary project has resulted in a number of publications concerned with the sound in Byzantine churches in modern Greece (Antonopoulos et al. 2017; Gerstel et al. 2018; 2021). Underlying the notable appearance of angels and other angelic figures taking a central position in the dome of churches dated to the last centuries of Byzantium, *Soundscapes of Byzantium* focuses on the confluence of acoustical parameters, architectural forms, visual imagery and live chant recordings in several churches of Thessaloniki.

The acoustics and aural experience in Orthodox churches of the Slavic speaking world is another rapidly growing area of research (Đorđević, Penezić, Dimitrijević 2017; Đorđević, Novković 2019). One of the most recent projects on the acoustics of Serbian Medieval monastic churches of the fourteenth century involves the measurement of impulse responses and the analysis of acoustic parameters, such as Reverberation Time, Early Decay Time, Speech Clarity and Speech Transmission Index (Đorđević, Novković 2019). The measurements showed how sound changes depending on the position of the congregant and the sound source, affecting both speech intelligibility (for preaching) and the experience of chanting.

4 Digital Tools, Community Archaeology and Reception of Byzantine Sacred Landscapes

A pilot study from Cyprus provides a paradigmatic and fascinating case in terms of heritage management, the reception of the Byzantine/Medieval sacred spaces and landscapes, and Community Archaeology. This pilot study draws from the *Unlocking the Sacred Landscapes of Cyprus* research project (UnSaLa-CY, EXCELLENCE/1216/0362), codirected by Athanasios Vionis and Giorgos Papantoniou on behalf of the University of Cyprus, in collaboration with the Cyprus Department of Antiquities, and funded by the European Regional Development Fund and the Republic of Cyprus through the Research and Innovation Foundation. The aim has been to examine how residents and visitors in the Xeros River valley (Larnaca District) make claims to, remember and experience religious and secular monuments of the Byzantine/Medieval past and their surrounding landscapes, while also investigating how claims are managed, negotiated and contested by local communities and the state.

The Xeros valley is located today at a major junction of the island's motorway, linking the capital Nicosia, with the towns of Larnaca, Limassol and Paphos. Although the Xeros valley never attracted the interest of Cypriots driving on the busy motorway, its location on the edge of different Iron Age city-kingdom territories, its immediate

proximity to the major infrastructure of the Roman road network, its choice as one of the most strategic localities of the Turkish Cypriots and the bloody bi-communal conflicts in the area in the 1960s, its habitation by Greek Cypriot refugees after 1974, and the establishment of the only governmental Reception Centre for Asylum Seekers in Cyprus at Kophinou (hosting refugees from neighbouring countries in war), confirm the centrality of this un-central rural landscape today (Papantoniou, Vionis 2017; Papantoniou, Morris, Vionis 2019a).

4.1 Digital Tools and the Exploration of Sacred Spaces and Landscapes

Competition, conflict and violence were at work in the Xeros valley, especially during Cyprus' recent past, having affected local communities living in the region nowadays by creating negative memories. In an attempt to answer the basic question of 'who owns the past', UnSaLa-CY proceeded with engaging with the local communities by bringing the results of the project and the region's natural and cultural landscapes closer to its present-day inhabitants through public talks and guided tours, in combination with the development of a mobile application providing an on-site tour to landscapes and monuments in the valley.

 While new technologies for capturing the dynamics of cultural landscapes are constantly emerging and developing in the study of Mediterranean landscapes and spaces, the employment of experiential approaches when it comes to religious landscapes remain relatively underdeveloped. In order to remedy this, UnSaLa-CY developed an Augmented Reality (AR) mobile application to support the exploration of Byzantine/Medieval religious monuments and archaeological sites in the Xeros valley, serving as an on-site guided tour for visitors in the area. By employing image recognition and utilising a location-based practice, the application provides the users with an immersive and educational experience (cf. Ioannou et al. 2021).

 Through the UnSaLa-CY application, visitors and current inhabitants of the Xeros valley have the opportunity to get in touch with the historical memory of the region and gain, in an indirect and novel way, an experiential contact with ten religious and secular Byzantine and post-Byzantine monuments and their surroundings, through explanatory texts in Greek, Turkish and English, images, 360° viewers and 3D virtual models and reconstructions. The operation of the application utilises target images placed at the ten Points of Interest (POI) along the cultural route. The application encourages visitors to visit those POIs and scan the target images using their smartphones. Once a target is recognised, the users are able to get historical information about the corresponding monument while in particular cases

(at the sites of the churches of Panagia Kophinou and Panagia Asta-thkiotissa) they can observe a recreation of part of the Byzantine/Me-dieval settlements through their smartphone's camera feed. A score is maintained while the user visits each monument; the objective is to motivate the users to complete the route by visiting all the monu-ments/landmarks and experiencing an enhanced AR exhibition while getting information about the historical and archaeological context of each site. Initial reactions by experts in landscape studies indicate the potential of the application in enabling the narration and visuali-sation of the historicity of the landscape and the fate of religious and other monuments of the past 1,500 years. The different monuments and sites in the area, Orthodox and Muslim, Byzantine and Ottoman, Greek-Cypriot and Turkish-Cypriot, comprise landmarks of a collec-tive memory in the landscapes of the Xeros valley today. At the same time, the presence and coexistence of these monuments in the area in the twenty-first century reflect timeless and current phenomena: prosperity and symbiosis, displacement, immigration and human suf-fering, creation of national and religious identities, destruction of sa-cred sites and abandonment (Papantoniou, Morris, Vionis 2019a, xv).

4.2 Community Archaeology and Cognitive Psychology

The Community-Archaeology venture by UnSaLa-CY, the first initia-tive in the domain of public archaeology in Cyprus to have been or-ganised by a Cypriot institution, has clearer longer-term objectives related to public engagement and the employment of landscape ar-chaeology in healing various forms of social traumas (Papantoniou 2021). The public engagement activities of the project, carried out in 2020 in the Xeros valley, consisted of the development of a cultural route to Byzantine/Medieval religious and secular monuments and sites offered through the aforementioned mobile phone application and the organisation of public outreach ventures that included a guid-ed tour and an educational activity for children in the three main com-munities of the region. The latter formed a pilot exercise in engaging with the public and the local communities of the valley as a basis on which to build more informed activities in the field of public archaeol-ogy in the region. As such, the project sought this opportunity to get a better sense of the people participating in the events and how they experienced Byzantine/Medieval heritage sites in the region but also to enable local narratives and engage with oral histories.

Although the exploration of emotions in human experience is bet-ter suited for qualitative methods, UnSaLa-CY included an open-end-ed question in the distributed questionnaire asking participants to describe how they felt during the tour, as a preliminary enquiry into their emotional reactions to their overall experience. The response

rate by the local communities, archaeology students, professional guides and other interested parties was 60% and the responses suggest that people were more cognitively involved and somewhat emotionally engaged with variations in the degree of engagement. The participants learned about a region of negative memory, they observed through a different angle the Byzantine/Medieval religious monuments and landscapes they knew nothing about, while, most importantly, local inhabitants, most of them Greek-Cypriot refugees in the region since 1974, felt they came closer to their new home and appreciated its similarities and differences with their villages of origin.

Another aspect of the UnSaLa-CY project in connection to memory and sacred space is a collaboration with Silversky3D, RISE and the Department of Psychology at the University of Cyprus, in which it brings in a challenging and unconventional dimension to Byzantine Studies and to the experience of cultural heritage by contemporary communities. Following the observation that there is a preference for churches as the most affective places in the region may reflect what most Greek Cypriots feel about Christian places of cult, "representing the Greek Cypriot collective identity more than anything else in the island" (Harmanşah 2014, 77), UnSaLa-CY proceeded with the employment of Cognitive Psychology in the study of sacred monuments.

On the outskirts of UnSaLa-CY's research area in the Xeros valley, lies a fourteenth-century church dedicated to Panagia Astathkiotissa. During the bi-communal conflicts in the 1960s, Turkish Cypriot villagers originally from the area or displaced there, most probably shepherds, had the habit of visiting this Medieval church, abandoned and inaccessible to Greek Cypriots at that time. There is evidence of specific Turkish names and dates inscribed on the walls, next to the removed faces of some of the saintly figures. Through anthropological, ethnographic, and cultural heritage research, UnSaLa-CY aims to bring this Medieval sacred space into conversation with religious competition, conflict and violence in the contemporary world (cf. Kong, Woods 2016). At the same time, with the support of computational applications, such as Virtual Reality Technologies, and the development of a number of cutting-edge methods in Cognitive Psychology, memory and spatial cognition (by Marios Avraamides, Department of Psychology, University of Cyprus), UnSaLa-CY combines current trends and approaches in archaeology and psychology, to open up new horizons and opportunities for the exploration of memory, experience and perception of this religious space and its historical fate. More specifically, the project and the application of computational approaches combined with Cognitive Psychology explores how religious groups in the area (first the Christians in the Middle Ages, then the Greek Cypriots and the Muslim Turkish Cypriots from the Ottoman era to today) make claims to and remember or experi-

ence sacred spaces (such as the church of Panagia Astathkiotissa). In the end, this particular Medieval sacred monument and others in Cyprus give rise to new forms of negotiations, strengthening the development of social and religious resilience, and contributing to resilient societies (Papantoniou, Morris, Vionis 2019a, xv).

5 Conclusions

Despite the deterministic nature of digital tools and approaches to the exploration of sacred spaces and landscapes, from Geographical Information Systems to remote sensing and Augmented Reality, the successful convergence of new computational techniques and visualisation technologies with the Humanities can potentially result in the development of novel approaches to the study of Byzantine landscapes and society. When combined with contemporary theoretical and interpretative trends, the investigation of Byzantine sacred landscapes can become a truly interdisciplinary field, aiming at a better knowledge of the *Homo Byzantinus*.

New-generation research projects in the field of Byzantine Archaeology have the potential to adopt a truly holistic inter-/multi-disciplinary approach to the study of Byzantine ritual, sacred space and landscapes, involving archaeologists, computer scientists, geophysicists, geologists, topographers and cognitive psychologists. Such attempts can bring together textual, epigraphic, art-historical, sociological, and anthropological data, incorporating field archaeology (archaeological and geological surveys, geophysical subsurface reconnaissance, aerial survey, targeted excavations), digital approaches (e-databases, GIS, 3D technologies), laboratory analyses (chemical analyses, petrography) and ethnographic studies. Moreover, by employing a range of heritage management practices and educational techniques (as we saw in the case of the Xeros valley in Cyprus), we can bridge the gap between the Byzantine past and contemporary cultural identities. Ethnographic and anthropological approaches are also able to provide an innovative anthropocentric interpretation of the collected data and digital methodologies. Finally, the development of cultural heritage management tools can create new ways to investigate and promote Byzantine ritual and sacred landscapes and improve contemporary experiences of them, serving to bridge the gap between the Byzantine past and the present, and between scholarly and non-scholarly audiences in a global context.

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