Virtual Reality and Memorials

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(Re)building and experiencing the past

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Introduction

The 'traditional' memorial, in the physical forms of museums, monuments, and statues, has been discussed extensively (especially in regard to the National Mall—see Miller 2005; Savage 2011), but in recent years, with the advancement in technology, scholars are increasingly exploring the possibilities and consequences of digital remembrance (see, e.g., Harrison 2009; Hess 2007; Kaelber 2007). Within this work, virtual reality (VR) has been used to safeguard protected locations, such as archaeological sites (F. Bruno et al. 2010), and recreate them for present and future generations (e.g., Pierdicca et al. 2016). Indeed, the term 'virtual heritage,' as a combination of cultural heritage and virtual reality, has been used and applied since the turn of the century (Roussou 2002); yet geographers (especially those interested in heritage and memory) have broadly not engaged with the potentials of VR in their research.

This chapter, as one of the first geographical considerations of VR for memory research, examines the possibilities and problems that arise from such research by reflecting on a memory method workshop held on Washington's National Mall in April 2019. In doing so, we critically analyze how VR can be used to reconstruct the past (both real and imagined), and the implications of being immersed in a virtual environment. It is demonstrated that whilst VR may have promise in memory research, it is important to avoid the pitfalls of 'solutionism' (cf. Morozov 2013). Rather than merely developing (technological) solutions to problems that do not exist, it is crucial to consider the practical and embodied nature(s) of being in a virtual environment to ensure that VR is used effectively in memory and heritage research.

Virtual reality

Although one of the key texts on VR and geography was written over fifteen years ago (Fisher and Unwin 2003), geographers have only slowly begun to engage with this technology. Indeed, Batty, Lin, and Chen (2017) argue that whilst geographers often work with three-dimensional (3D) environments, immersive technologies are rarely adopted in geographical practice. In recent years there has been an increase in the use of VR for research, primarily driven by the commercial development of new, high-quality devices, including standalone headsets that do not need to be tethered to a powerful computer (Jones and Osborne, forthcoming). While this may mean that VR is becoming more mainstream, social scientists are only just beginning to engage with the methodological possibilities of this technology. VR has, however, been heavily researched and applied in computer science, with scholars exploring notions of immersion (Cheng, She, and Annetta 2015; Jennett et al. 2008; Zhang, Perkis, and Arndt 2017), presence (Bulu 2012; Witmer and Singer 1998), and sense of place (Benyon et al. 2006; P. Turner and S. Turner 2006).

VR's most compelling quality is in many ways also its biggest weakness. A sense of presence is often taken to be a subjective marker of quality in video games (Schumann, Bowman, and Schultheiss 2016), but VR by definition removes people's awareness of the material world in order to immerse them in a virtual environment. This creates significant risks of injury from tripping over real objects or getting tangled up when using a wired headset. Indeed, the apparent reality of the experience can cause participants to lose their balance when responding to visual prompts within a headset (Menzies et al. 2016). It can also be quite socially isolating as shared experiences tend to be either rather clunky (Gugenheimer et al. 2017) or very expensive to set up (Schild et al. 2018). Indeed, despite significant improvements to visual fidelity, there remains considerable work to be done combatting so-called VR sickness, caused when the actual movements of the body do not quite match up to the virtual movements being reproduced in the headset (Lee, M. Kim, and J. Kim 2017).

Despite these issues, VR has been widely employed in specialized applications where it would be too dangerous or expensive to undertake that experience in the real world. VR has been applied as a training tool in medicine, the military, and for those visiting hazardous environments such as industrial sites (see, for example, Grabowski and Jankowski 2015; Lele 2013). Here the drawbacks of VR as a medium are far outweighed by the ability to allow people to develop an understanding of a given space or experience in a low-risk environment. This also demonstrates the great potential for research use. Virtual environments can be inexpensively built to examine how participants behave in a particular scenario (Felnhofer et al. 2015), or simply to allow them to experience and reflect on an otherwise inaccessible location (Guttentag 2010).

Virtual environments for heritage

VR has been quite widely deployed within the heritage sector, with many experiences being developed and applied in museums and heritage sites that can be difficult to access (Jung et al. 2016). For example, Oculus, in collaboration with Anne Frank House and Force Field VR, developed a 25-minute immersive tour of Anne Frank's Secret Annex. This tour, which is a free VR application, allows audiences to visit the secret annex even if they are unable to travel to Amsterdam or have limited mobility and cannot climb the stairs.[1] An increasing number of heritage sites and museums worldwide have been using VR and augmented reality (AR) technologies in their exhibitions, including the British Museum, the Museum of Modern Art (MoMA), and Paris's National Museum of Natural History. The use of VR by these museums and galleries not only allows people who previously were unable to access these spaces to have those cultural experiences but also enriches the exhibition through interactivity (see, e.g., Mortara and Catalano 2018). This counters Champion's (2008) claim that virtual heritage environments merely focus on the presentation, not the experience. Drawing upon the literature of non-representational theory, discussed throughout this book, it is possible to situate VR as a virtual place which presents users with a variety of affectual and embodied experiences. VR, just like other forms of virtual worlds (such as films and video games), blurs the distinction between the real and the imagined, and consequently has been frequently discussed using non-representational theories (see, e.g., Ash 2010; Carter and McCormack 2006; Shaw and Warf 2009). Being immersed in a VR environment, however, has uniquely fully embodied features, which enriches the affective capacities of both the (re)built landscapes in the headset and the emotional connections with the real places they represent.

Bob Stone and his Human Interface Technologies Team (HITT) at the University of Birmingham, for example, have been working with virtual reality for over thirty years in collaboration with military defense, healthcare, and the heritage industries (Radd 2017). The heritage sector, which Stone regards as his "personal favourite," enables him to "undertake projects as wide-ranging as using drones to recreate VR models of remote areas of historical significance, subsea wreck visualizations, and the development of VR and AR content to support the educational aspects of the Mayflower 400 commemorations scheduled for 2020" (Stone quoted in Radd 2017, n.p.). Stone and the HITT have explored the possibilities of using VR for heritage on a wide range of historical sites, including Mesopotamia (Hanes and Stone 2019), Stonehenge (Stone 1998), Wembury Commercial Dock and Railway of 1909, HMS *Amethyst*, and the warship *Anne* (Stone 2015). The HITT's work is interesting because they immerse people in these virtual environments to explore how they connect to the history of their local area, demonstrating how virtual experiences can help deepen connections to physical places and the imaginative place images. For example, the HITT have used underwater robot sonar systems and old maps to create an extensive 3D model of the Burrator reservoir in Dorset, United Kingdom, to visualize the landscapes as they existed before they were flooded. Although the model is factually based, the HITT added an imagined church to their model because "there's a popular myth that when the water is low enough the spire of the village church will appear above the waterline and the bells will chime" (interview with Stone in BBC News 2018, n.p.).

Similarly, the Memoryscapes project based at Northumbria University, United Kingdom, has been exploring how heritage assets can be recontextualized using immersive technologies, including but not limited to virtual and augmented reality (Swords 2019).[2] Unlike many projects involving VR, the Memoryscapes project seeks to avoid 'solutionism' by organizing workshops with various stakeholders and members of the public to aid the development of these immersive environments. Although this project is yet to publish their findings, Memoryscapes has begun to demonstrate the possibilities of participatory creation and application of virtual worlds to understand heritage, narratives, places, and audiences. Building upon the work of the Memoryscapes project and the work of Bob Stone and his HITT, this chapter considers two major possibilities of virtual environments and reality for heritage and memory-based applications: recreation of past landscapes (e.g., Burrator reservoir), but also the embodied experiences of virtual transcendence.

Method

This chapter discusses some tentative findings from a methods workshop held on the National Mall in Washington, DC, as part of the Association of American Geographers Annual Conference in April 2019. The workshop, entitled "Applied Memory: Putting Affective & Embodied Methods into Practice on the National Mall," explored the use of different memory methods to investigate four memorials: the Vietnam Veterans Memorial, the Korean War Veterans Memorial, the Martin Luther King, Jr. Memorial, and the United States Holocaust Memorial Museum. The workshop enabled participants to explore a variety of methods, including biosensing, a smartphone application, embodied ethnography, video and sound recording, and VR. For the VR component, three virtual environments were loaded onto Oculus Go Headsets, which were shared with the workshop attendees (Figure 15.1). Alongside the other memory methods used in the workshop, the VR environments were developed to allow the participants to have the experience of using the headsets (which is often a new experience for many people), but also help deepen their connections to the physical places visited during the workshop and the (re)built or imagined spaces of the past. The Oculus Go is a standalone VR headset which is untethered from a computer but only tracks in three degrees of freedom, meaning that the headset responds to the user's rotational/head movements (orientation) but not embodied directional movement (position). The only way to move around a model in the headset is thus 'teleporting' via a handheld controller.

For the memorial sites selected, we built two environments in Unity,[3] a recreation of Martin Luther King Jr.'s "I Have a Dream" speech on the National Mall (Figure 15.2) and a representation of Albert Speer's Germania plan for the reconstruction of post-war Berlin. Both were designed to

Figure 15.1 Workshop participants using the Oculus Go Headsets on the National Mall

Figure 15.2 The National Mall recreated in Unity

complement the experience of being physically present on the Mall. We also gave participants the opportunity to experience a 360° video of Auschwitz Concentration Camp whilst located within the United States Holocaust Memorial Museum.

Martin Luther King's "I Have a Dream" speech

On August 28, 1963, when 250,000 people gathered at the Washington Monument for the goal of securing civil rights for black Americans, Martin Luther King Jr. delivered his famous "I Have a Dream" speech, which "transformed a meandering march into one of America's historic events" (Brooks 1974 quoted in Vail 2006, 51). The speech, in which King describes and argues for his dreams of equality and freedom in a nation with a history of slavery and racial distrust, was filmed and has subsequently been remastered,[4] allowing current and future generations to experience such a momentous event. Besides one of the remastered audio files of the speech, a simplified model of buildings within the capitol area was also purchased to form the base of the virtual environment. This was edited to remove parts of the map that would not be seen from the Mall (e.g., the Arlington district on the opposite side of the Potomac River) and then augmented with readymade 3D assets available through the Unity Store to add trees, water, and the sky. A 3D model of Martin Luther King Jr. himself was added, standing on the steps of the Lincoln Memorial along with an audio recording of the speech that played as users navigated the environment.

Albert Speer's Germania

Berlin was intended to be redesigned following a German victory in World War II and renamed Germania. The project was led by Albert Speer, Hitler's chief architect, and was to have been a lasting monument to the Third Reich's power and grandeur for thousands of years (Featherstone 2005; Speer 1970). Indeed, the architecture was designed to be monstrously large (e.g., the interior of the Volkshalle was designed to be sixteen times the size of St. Peter's

Basilica Dome with a height slightly smaller than the Eiffel Tower). The design took inspiration from a variety of sources, including Ancient Greece and the Roman Empire as well as classically influenced contemporary 'state' architecture such as the National Mall (Lane 1986; Scobie 1990); yet very little of the project materialized. With game engines like Unity, however, it is possible to build this unmaterialized project and allow people to experience the sheer *scale* of Speer's design and its underlying megalomania. In common with the recreation of the "I Have a Dream" speech, we used pre-existing 3D assets, including a model of the Reichstag, a pre-existing building which Speer integrated into his design. The inclusion of this actual building helps establish the monstrous scale of the planned development, which we also indicated by including a car parked in the main square and positioning eye level for the game camera as being 1.8 meters from the ground.

Auschwitz Concentration Camp in 360°

An accurate model of Auschwitz has been developed in Unity to aid prosecutors of a former SS guard who claimed he had been unaware of the murders taking place on the site (Buder 2019). This model, however, is not readily available for public use and is too detailed and complex to run in the relatively underpowered Oculus Go Headset. Instead, we used a pre-existing 360° video, the 'Auschwitz-Birkenau Walk through' produced by Discover Cracow (2016). This promotional video, which we edited for length and to remove a somewhat distracting audio track, lasts three minutes and depicts various locations within the camp, including both interior and exterior spaces. The use of this video allowed the workshop attendees to experience the various spaces of the camp which could then be used to reflect on the design choices that were made both for the United States Holocaust Memorial Museum building and its exhibitions. Indeed, some of the participants reflected on how the use of red brick, metal, and glass—which gives the museum a particular industrial feel—echoes the design of the concentration camp. Thus, the use of the 360° video not only allowed the participants to see Auschwitz beyond photographs but also to easily evaluate the affective architectural design of the museum by blurring the real and the virtual.

(Re)building the past

Aside from complementing the visited memorials during the workshop, these three virtual environments demonstrate how virtual reality can be used to recreate, reimagine, and reconnect the past and the present. Physically standing in the National Mall is a reminder of how these kinds of monumental spaces gain their power from dwarfing the individual in an immense, stark expanse stripped of human activity. The VR model, meanwhile, does not attempt to reproduce the crowds who were present at the speech in 1963[5] and instead strips the landscape back to its simplified and symbolic form, without the clutter of tourists and the constantly distracting flow of aircraft heading into Ronald Reagan National Airport that are present in the material environment. The empty spaces in the VR model thus reaffirm some of the intimidating power of this planned landscape and enhance one's 'reading' of the actual space.

Placing audio of King's words within the model of the National Mall at one level simply allowed participants to orientate themselves, gaining an understanding of where he stood when giving one of history's most famous speeches. This in turn allowed them to imaginatively populate the space of the actual Mall beyond the headset, understanding something of how the crowds would have been fitted into the location. The speech itself runs to just sixteen minutes, with the section that plays in the headsets only including the last five minutes, which feature the renowned, repeated refrain "I have a dream." Although the refrain is familiar, for many the speech is not and listening to it can be a tremendously moving reminder of the cause that was being fought for by King's March on Washington for Jobs and Freedom. The sense of its significance is heightened by bringing the speech back into the physical space in which it was given, with the VR model allowing a creative collision of the virtual, physical, and imaginative in order to create a unique experience of the National Mall as a heritage space.

This experience took a somewhat darker turn when we asked participants to examine the Germania model. The architectural style favored by Albert Speer was a kind of simplified classicism common in government buildings of the period. As architectural historian Barbara Miller Lane (1986) highlights, Paul Cret's design for the Federal Reserve Board Building located just at the edge of the National Mall, which was completed in 1937, has a strikingly similar look and feel to what Speer planned for Berlin. Being able to look around the Germania model gives an opportunity to understand something of the axial plan for a monumental parade route that was envisaged as well as the sheer scale of the buildings. Even though the material landscape of the National Mall is intended to be intimidatingly large, the Germania model is even bigger, lined with buildings of an inhuman scale. Nonetheless, the architectural style and purpose of Germania is not radically different from the National Mall—it was simply designed to be somewhat larger. The similarities between the experience of a virtual environment designed to celebrate the achievements of a Nazi government and a material environment celebrating the United States created a frisson of discomfort for Phil when he was building the model, but also for the participants during the workshop. It also raises questions about how the atmosphere of place is changed by the creation of these kinds of large memorial spaces at the heart of cities.

The experience generated by the 360° video was somewhat different from the built environments, in part because it is actual footage of a real space, rather than an abstract rendering in a games engine. The lack of interactivity does, however, give more of a sense that the viewer is a spectator rather than actually immersed in the scene. The opportunity to see the material textures of the camp allowed participants to understand how the design language of the museum echoed, without reproducing, those environments. Of course, a more detailed 3D model, such as the one built by German prosecutors, can also give this sense of texture. Indeed, there are now many models of heritage sites built with minute detail using laser scanning and photogrammetry. When these models are repurposed into a games engine and placed in VR, they can give a powerful sense of being *in* that location. As such, this is clearly a useful approach for exploring how different landscapes are remembered by letting participants experience heritage spaces that they might not otherwise be able to access.

Experiencing the past

It would be too easy to be seduced by the technology into forgetting that heritage is something more than a physical form and is brought into being through the intersection of the material and the more-than-representational. A heritage-rich landmark is a place where a range of different activities can occur, especially spaces incorporating a cultural site since they are the historical location of rituals, performances, and affectual flows. To understand the significance of these heritage-rich spaces, a virtual 3D reconstruction may not be sufficient. Indeed, Kalay (2008), Dave (2008), and Tan and Rahaman (2009) have each critiqued VR for merely representing the tangible, or physical aspects, of heritage at the expense of its intangible and emotional qualities. Yet virtual experiences can be emotionally, affectively, and psychologically impactful. Decades of research on VR suggests that people internalize their virtual experiences and treat them as real (Blascovich and Bailenson 2011).

Experiencing a VR environment through a headset is a curious embodied experience, similar to entering a dream state, that allows an individual to transcend space and time whilst being (mostly) immobile. Thus, exploring a VR environment could be argued to be an example of quiescent experience (cf. Bissell 2008, 2009) where the body is physically sedentary but 'moving' beyond the limits of the physical body. For example, many of the workshop attendees had never been to Auschwitz and had only seen it through photographs and videos. Yet through being immersed in a 360° video, the attendees felt like they had a 'presence' in the environment, as if they were physically there. Furthermore, it is this transcendent quality of using VR that makes it such an effective tool for memory scholars because it allows researchers to immerse their subjects in the spaces and places of the past. This immersion creates a greater sense of emotional connection to those locations, which can then prompt more nuanced reflections from participants being asked to discuss a particular place.

When the individual enters a dreamlike state in VR, the body can be subject to performative slippages such as lurching, murmuring, and what we jokingly term 'VR face,' where the individual has their mouth agape for their period in the headset.[6] When immersed within a VR environment, the body enters a close-to-subconscious state where the body withdraws and relaxes and "the smooth, well-practiced, calculated veneers of performance recede, to disclose the bare life of the autonomic body" (Bissell 2009, 431). Aside from these performative slippages, however, the body can also be bothered by the VR headset. Tess vividly remembers being overcome with simulator sickness while exploring a virtual model of Wembury during her first experience in a VR environment whilst on a tour of Bob Stone's lab.[7] Sadly, this is a common occurrence as a result of movement lag—where the moving of one's head and line of sight is not at the same speed as movement in the VR environment—and can often discourage people from engaging with VR. Indeed, this was the case for one of the workshop attendees who had suffered from simulator sickness in the past and, as a result, did not want to take part in the VR aspect of the workshop. Taking regular breaks from VR is often seen as a way of avoiding simulator sickness (as well as other issues such as eyestrain and reality blurring [cf. Bailenson 2018]), but this discontinuity can distract from the experience of being in the virtual environment.

It is also important to stress that an experience in VR rarely feels completely immersive because most of the virtual environments are designed with limited opportunity for active participation by users. Rarely is there a role for the visitor to play or any task to perform that is not predefined. Mosaker (2001) argued that virtual heritage environments suffered a lack of 'thematic interactivity.' This means users can move around inside the environment without any certain goal or objective in mind, which sometimes leaves them feeling lost and bored. At the workshop, however, the novelty and consequential excitement that arose from being in the VR headsets meant that none of the participants was bored. Yet, the novelty of the VR also meant that many of the workshop attendees needed to explore the environments twice—the first time to get used to interacting in VR, and the second time to explore the virtual heritage environments. Indeed, it is important when planning any research using VR to allow additional time for the users to get used to the technology and the experience of being in a virtual environment.

Conclusion

VR offers an exciting opportunity for memory and heritage researchers to (re)build and experience spaces of the past. These technologies allow scholars and the heritage sector to give participants and visitors access to experiences that would otherwise be either difficult or impossible, but they also stretch our imaginations to see the real world in new ways. And whilst impossible structures can be recreated in video or image, it has been argued that VR feels 'more real' than other virtual representations because VR experiences "will feel so realistic and immersive they will have the potential, similar to experiences in the real world, to enact profound and lasting changes in us … [it is] better understood *not as a media experience, but as an actual experience*"

(Bailenson 2018, 12, 47). As a result, VR as a memory method has a unique capacity to evoke affects which not only enrich the experience of being in a VR headset but also our understanding of and associations to sites of memory and past landscapes (both real and imagined).

The use of VR should, however, be treated with a degree of caution. For all the possibilities that it can bring to memory and heritage research, it is important not to adopt a method that is simply novel for the sake of novelty (cf. Merriman 2014), but consider whether this is an effective method for the research focus. It is easy for researchers to plunge into the pitfalls of 'solutionism' (Morozov 2013) and simply develop a method that answers a non-existent research question. Regardless, we still believe that there is a future for VR in memory studies, especially when it is used as a tool to facilitate other methods. Carefully deployed, VR elicitation interviews, participatory VR, and similar hybrid approaches can help social science and humanities scholars reveal more-than-representational understandings of the past.

Notes

1 It is important to note that the Anne Frank Secret Annex in VR has not been without criticism and ethical debate as a result of its sensitive subject matter (e.g., Fletcher 2016).
2 Additional information about the Memoryscapes project can be found at the project website (https://numemoryscapes.wordpress.com/). Also see: https://heritage-research.org/case-studies/memoryscapes-re-imagining-place/.
3 Unity is a game engine used to build 3D and 2D environments compatible with both desktop and standalone VR/AR devices.
4 For a remastered video of the speech, see: www.youtube.com/watch?v=vP4iY1TtS3s.
5 This was in part a practical decision. The headsets being used would have struggled to run a complex model containing multiple characters in a crowd, while a simplified crowd would have looked distractingly fake, spoiling the sense of immersion.
6 We do have images of 'VR face' but decided not to include them in this chapter to avoid embarrassment.
7 Wembury is a small village situated in Devon, United Kingdom.

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