HISTORY | RESEARCH ARTICLE

What constitutes the virtual: representation and memory in ancient Roman frescos

Tatjana Crossley1*

Abstract: This paper examines a specific historical context of the virtual reality (VR), commonly associated with contemporary society, in order to consider its lineage. It sets up an argument that identifies archaeological examples, which worked with subjective perceptions of space, as predecessors to the digital technologies familiar in the 21st century context. While the paper acknowledges the use of VR representation throughout history and around the world, the focus will be on key Roman villas, specifically on their frescos, and the importance of these immersion spaces in Roman society for reasons that approach both the social and introspective. As technology is not a term merely beholden to the digital, encompassing major revolutionary human advancements such as language or agriculture, the paper examines the historical technologies, i.e. the representational techniques, that produced virtual realities and immersive environments of the past. It uses the Ancient Roman context to illustrate the relationship between representation, subject(s), and society, which can be examined from a historical context and further applied to the contemporary.

Subjects: Social History of Art; Visual Culture; Design; History of Art & Design; Archaeology; Roman History & Culture

Keywords: virtual reality; representation; Roman art; architectural history; memory

ABOUT THE AUTHORS

Tatjana Crossley is co-founder of architectural and research practice ArchITAG. The practice tackles issues of the experience of space, architecture’s impact and influence in the development of subjectivity, and the production of space that challenges societal histories of discrimination. She and her partner at ArchITAG explore technological aspects of design in order to propose new modes of perceiving and fabricating our environments.

Tatjana completed her PhD at the Architectural Association, Master’s at Harvard’s Graduate School of Design (MArch II) and Bachelor’s at Rice University (BArch). She has worked in practice, for S.O.M. San Francisco, and academia, currently teaching at the School of Architecture at the Chinese University of Hong Kong and previously teaching the Diploma 20 unit and History and Theory Studies at the Architectural Association in London. Tatjana’s research focuses on the sensorial and psychology of immersive environments and virtual realities. She has been examining the development of the body image in relation to how the subject perceives space, themselves within it, and the “other”, using theories from psychology, philosophy, biology, technological sciences, art and architectural history. Her research has been published and exhibited as part of the SAI Future Technologies Conference, ISWC Design Exhibition and recently in the 1st and 2nd issues of the architecture journal PAX Monographs. Tatjana has presented and guest lectured at various conferences, symposia and academic institutions.

© 2022 The Author(s). This open access article is distributed under a Creative Commons Attribution (CC-BY) 4.0 license.

Received: 10 April 2022
Accepted: 20 October 2022
*Corresponding author: Tatjana Crossley, School of Architecture, Chinese University of Hong Kong, Hong Kong SAR
E-mail: Tatjana.crossley@gmail.com

Reviewing editor: Samuel Adu-Gyamfi, History and Political Studies, Kwame Nkrumah University of Science and Technology College of Arts and Social Science, Ghana

Additional information is available at the end of the article
1. Introduction

1.1. Thesis
It is evident that the virtual reality is not a new phenomenon but rather one that is derived from a long lineage of historical and archaeological spaces that produced perceptual illusions utilizing the respective technologies. This is not a new thesis; it has been put forward by other scholars examining the immersive techniques produced before the advent of their contemporary digital counterparts. This paper argues that these spaces not only serve as precedents for contemporary use of VR but were, in some ways, also far more nuanced than contemporary applications of VR, being used for the production of knowledge and identity and creating an experience that re-evaluated subjectivity. The thesis draws upon archaeological texts in order to emphasize this key aspect—VR spaces of antiquity were sites of intellectual transference and discourse. Additionally, these ancient examples give insight on the societal conditions of their time. They reflect the values and aspirations and serve as time capsules that represent the greater context. Similarly contemporary VR’s paint a picture that illustrates contemporary conditions. This paper seeks to extract the respective values, lessons and successes of the early virtual realities so as to better understand how we might evaluate their contemporary successors.

1.2. Context
Virtual reality (VR) has become a term generally associated with digital interfaces manifested by digital screens and head mounted displays. The term was first used by Jaron Lanier in the 1980’s to describe the work he was doing in VPL Research. However, the definition can be applied to various other examples throughout history and even before Lanier there were inventors such as Morton Heilig working on multisensory simulated experiences and head-mounted displays. There is a long history of these spaces that exist in the “analog.” Scholars like Oliver Grau even argue for prehistoric cave paintings as the first VR spaces (Grau, 2003)⁴ modes of representation that were intended to convey a narrative. In this sense, representation- the drawing, the virtual environment- is a form of language, or rather, language is a mode of representation, and these convey some sort of lived or imagined reality. Because we have evolved to be generally a visual species,² using creative faculties to translate these languages into an image based mental interpretation, “[v]irtual reality forms part of the core of the relationship of humans to images.” (Grau, 2003: 5)
Ultimately the virtual exists through the `image³ and hence through narrative, a narrative that is comprehended and perceived by sensorial means.

Virtual reality is defined as a simulated experience that exists as something other than reality.⁴ This simulation is not beholden to contemporary technologies but can use various methods in order to allow someone to perceive the space. It relies on the observer and their subjective history (which includes their entire experiential history and their cultural and social experiences) in order to produce a particular reading and translation of the environment. In historical examples, different drawing techniques are adopted; we see use of things like atmospheric perspective and linear perspective attempting to simulate visual understandings of depth. (Damisch, 2002) They provide a reflection of the respective context’s perceiving modalities. While these drawing techniques tried to produce “realistic” interpretations of reality, we know that this is not a prerequisite for a successful virtual reality space. Contemporary examples such as the use of VR to reinterpret Zaha Hadid’s early drawings- a collaboration done by Google Arts and Culture and Zaha Hadid Virtual Reality Group- illustrate that abstract representations are equally effective at immersing a viewer. Similarly, there are several art historical examples of paintings that do not rely on linear perspective but still captivate and immerse their viewers into their alternate reality. Ancient Chinese theories of painting put forward that the representation “should be considered in its relationship to reality—a relationship of understanding rather than expression, of analogy rather than duplication, of working rather than substitution.” (Damisch, 2002:224) Additionally, while it was more challenging in historical examples than in contemporary ones to incorporate other sensory experience, they did also use smells and sounds to engage with the subject,
evidenced in cases like the large-scale panorama buildings from the 18th-19th centuries. (Oetterman, 1997)

Modes of representation that produce virtual realities and immersive environments have been developed and appropriated by artists throughout history and these have ranged in scale from that of the body to that of the building. While this paper will focus on VR produced through representation and framing, specifically looking at Roman frescos that date to before the Pompeian eruption of 79 A.D., it is important to acknowledge that there is a lineage of artistic and architectural VR spaces that have been created throughout history.

During the Renaissance, trompe l’oeil techniques were used in the production of theatrical spaces, including the more obvious examples such as stage sets for operas like Palladio’s Teatro Olimpico but also other architectural spaces such as Borromini’s Palazzo Spada. These worked with rules of linear perspective which radically changed human relationship with perception when it was “rediscovered” by Brunelleschi in the middle of the 15th century. (Damisch, 1994) By creating these foreshortened spaces in both the theatre context as well as architectural context, the spaces could appear much larger and invite further immersion into another spatial reality.

In (relatively) recent history, virtual reality was capitalized on as a form of entertainment in the context of fun fairs. We see several panorama rotundas constructed in the late 1700s and early 1800s. While these were intended for attracting audiences in much the same way the circus did, they also served a propagandist purpose. In the European context, many of the panoramas constructed at the time depicted battle scenes and portrayed one side as the humanized victors and the other as the faceless losers. They told a story of the combat that was so realistic that some viewers believed they were in the actual scene of battle, using additional techniques that involved the use of cannons, orchestrated bands, smoke, and faux terrain. The artists used optic techniques that prevented the viewers from perceiving what was 2D vs. 3D by placing the painted walls at a distance where the eye is no longer able to read depth. In fact these panoramas were so immersive they were critiqued for being too realistic and caused a phenomenon known as “panorama sickness.” (Grau, 2003) [Figure 1] These can be likened to panoramic drawings that were made in the Chinese context. While the scale was not the same, the Ancient Chinese artist, Wang Ximeng, in about 1113 AD produced a long (approximately 12 meter) silk scroll that depicted

Figure 1. Collage sketch of a panorama rotunda featuring images from the Battle of Sedan Panorama (credit: author).
A Thousand Miles of Rivers and Mountains, a landscape drawing meant to be viewed as a panoramic image. (Seed, 2022)

The 20th century development of the camera, which followed from a curiosity of the moving image seen in many fun fair peep show devices that worked by using various optical and illusionary tricks (Crary, 1992), meant that the immersive space could encompass motion like never before. While the panorama rotundas attempted this with their use of rotating platforms, canons and marching bands, the painted images still remained static and depended on the imaginations of their viewers to animate them. These new moving VR spaces continued to be used for entertainment purposes in the form of the cinema and were imagined into architectural spaces, like Gropius’s Total Theatre (un-built), meant to fully consume their occupants in order to radically influence their subjectivities. (De Zuvillaga & Javier, 2004) In the contemporary context, technologies such as CAVE, developed at the University of Illinois in the early 90’s, recreate the panorama rotunda and add an element of sensorimotor coordination with the experience of the space. These then serve as precedents for technologies of the 21st century and concepts like the Metaverse that take the panorama room to the scale of a world. There have been examples of projects done to this effect that look at more sociable spaces in VR, something perhaps lacking in earlier digital examples, and beginning to come closer to ideas of virtual spaces that can host the production of knowledge. For example, a prototype project developed by George Guida et al. called Gund.Io proposes an alternative space for virtual learning which has become more prevalent with the recent pandemic and is reflective of that experience. (Guida et al., 2021) These types of projects approach both augmented reality methods and entirely virtual reality methods and we are starting to see more development of contemporary VR spaces that are intended for more collective activity. This is an area in which early Roman fresco virtual reality spaces can provide valuable lessons.

Humans have utilized various technologies to achieve virtual reality spaces whether they exist in the 2-D, 3-D or 4-D and the digital technologies of today are merely one method of doing so. Much like how digital artists “paint” space through their computerized pixels, the ancient Roman artists that painted the wall frescos similarly created complex immersive environments that not only served aesthetic purposes but were crucial for culture and politics, and played an important role in place making and memory for the Roman inhabitant of the space. This latter aspect of virtual reality in the ancient Roman context shows that it was in fact used for perhaps more nuanced purposes than contemporary VR spaces.

This paper will elaborate upon the significance of the ancient Roman villa fresco looking at the use of atmospheric perspective, specifically in August Mau’s classification of the second style, the role of the frame, and how these immersions acted as memory palaces for their inhabitants while facilitating political and cultural discourse, inquiry and evolution. Previous research has examined the role of the subject,5 so the intention of this paper is to consider the spaces of VR and their function, from a historical and cultural context, in the production of memory and identity. It will primarily focus on the frescos of the Villa dei Misteri and the Villa Livia while drawing from discourse pertaining to the frescos of the Villa of P. Fannius Synistor at Boscoreale, the Villa of Poppaea at Oplontis6 and the House of the Tragic Poet in Pompeii.7

2. Representational methodologies and cultural significance
The virtual reality space is able to consume its occupant by virtue of the perceived effects of lighting, forms, and materiality depicted through the representation. This can be produced quite literally, creating architectural structures that provide a certain atmosphere or, as illustrated by the countless examples, can be done through painting and visual representations of space. In the Ancient Roman case, artists were painting frescos in the 2nd style used what is known as atmospheric perspective. This is not quite like linear perspective as it is more concerned with the qualities of depth rather than the mathematical interpretation of it. It is also known as aerial perspective and is a form of representation where objects in the foreground are more clearly
outlined as compared to those farther which take on a hazier quality in order to illustrate depth. This is achieved by reducing the vividness and contrast of the colours used and increasing the brightness of objects meant to be read in the distance. [Figure 2] This next section of the paper will describe the representational methodologies and materials employed specifically in the context of ancient Rome. These methodologies and the representations that resulted illustrate the impact of culture, society and the available technologies on the mode of producing a virtual reality space. From these spaces then, we can assess these factors to understand the contexts they were derived in.

Four fresco styles were classified by August Mau (in the later part of the 19th century) and these were used to convey different programmatic purposes and indicate degrees of significance. Not limited to any particular style, these frescos were also crucial in the practice of memory, which will be discussed shortly.

In the first style (known as the incrustation style), we see representation of stone and marble, usually elevated with a colour-blocking strand at the base 1/4th of the wall, which will be significant in the other styles, and generally seen at the entrance of the villa. There was the intrinsic framing created by this that distinguished the lower part of the wall from the upper which sets up a transitional space from that of the exterior public environment and that of the interior private living spaces. In a way this first style frames the space of the house and ultimately the space of the virtual reality through this transition from the material to the immersion. (Dietrich, 2019)

The second style (known as the architectural style), as mentioned before, utilized more illusionistic techniques and generally capitalized upon atmospheric perspective. Architecture was represented, columns and pediments prevalent, and also the conception of expanded space, generally representing vistas out to the distance. In this case, the frames are created in numerous ways. First, through the architectural elements framing these specific views that the user was meant to witness and contemplate and then, second, through the depiction of cornices usually including
elaborate representations of fruits and nature. Many of these frescos also included alcoves like in
the 4th style that interestingly provide contrast to the distant vistas. This expansion out from the
space of the room to that of the distant landscape almost dissolves the physicality of the wall
unbinding the space from its reality. In this case, the frame, rather than enclosing a picture plane,
opens up allowing the inhabitants to immerse themselves into the virtual space. This is further
amplified by the fact that, like the first style, there is generally a band left at the bottom of the
room. The images are lifted off of the ground so that they are not covered by those standing within
the room. Contrary to how this could be seen as creating separation, it actually allows for the focus
of the room to be drawn back into the centre, the walls of the fresco and their virtual reality
flooding back into the action of the room. Additionally, it provides an illusion of the space of the
floor being larger, continuing up the surface of the wall so that the floor and wall become one and
the figures of the fresco become part of the action of the room. (Dietrich, 2019) The panoramic
frescos frame the viewer and in doing so make the space of the room and that of the fresco
indistinguishable. This will be elaborated upon more when discussing the Villa dei Misteri.

Adding more complexity, these framed spaces mapped out a relationship between different
rooms in their villas providing an alternative organization of space that merged the physical with
the represented realities and, from a historical perspective, illustrating culturally unique notions of
space and how it is mapped, experienced and understood. (Plat & Squire, 2017:24–25) The space
framed the action and experience.

The third style (known as the ornate style) returned to a more abstract mode of representation,
depicting unrealistic architectures that were meant to be more fantastical and ornamental in
appearance. The perception of three-dimensionality was not so pertinent in this style and, instead,
these frescoes appear more flat, geometric, ornamental and unrealistic. Many times they incorpo-
rated Egyptian motifs and a reinterpretation of architectural elements that appear more vegetal.

Finally, the fourth style (known as the intricate style) merged the three previous styles producing
a very luxurious and ornamental depiction of space. While representing architecture in a way
similar to the 2nd style, it was less concerned with the framing of vistas and rather used the
representation of alcoves and painted frames to provide the illusion of ornament and grandeur.
The alcoves framed what Michael Squire refers to as “still lifes”, which many times consisted of
fruit. The framed images depicted can be paralleled to the contemporary with the art that hangs
on people’s walls to show status and values. In many cases, they portrayed mythical stories that
corresponded to one another, providing an overall moral interpretation of the framed images. They
were, like today, an opportunity to commission and own art done by the best artists and depicting
what was/is considered valuable and important in the society of the respective time. (Plat & Squire,
2017)

These methods of framing and representation will also be discussed more through the analysis
of the Villa dei Misteri and Villa Livia frescos, both of which are classified in the 2nd style. The
analysis will provide a way to understand these spaces as virtual realities with rich complexity that
serve as early precedents for the contemporary and what lessons can be extracted for VR today.
[Figure 3]

A component generally overlooked when discussing VR is its “bounding box”, constraints, or
enclosure- ultimately its framework. Every VR has a boundary condition, some more obvious than
others, but this is necessary in order to frame the experience. In the case of the contemporary
condition, we might think of the pixilation and the rule sets imposed, for example, the if the space
follows natural laws of physics, as forms of bounding box. In the physical space of the device
wearer, intangible extents are defined through it creating this bounding box for the experience.
In the case of the frescoes, framing plays a crucial role, not only in the interpretation of the extents
of the walls acting as a boundary condition for the representation but also in how they are painted.
It organized thought and memory (Bergmann & Victoria, 1994) and this is what makes it so radical
and is what can be learned from in the contemporary context. It is perhaps most clear and most literal in the 4th style with its representation of alcoves and painted frames but is also prevalent in the other styles. These frames ultimately direct a particular reading of culture and history—the representations are a significant source of understanding the values of society at the time and this can be said for all subsequent virtual reality representations. They “materialise cultural modes of structuring visual experience … function as reifications of different ‘scopic regimes.”’ (Plat & Squire, 2017:45) This is significant as it takes us back to Grau’s assertion that VR forms the core of the human relationship to images. Different cultures with different value systems illustrate their scopic regime through their use of the image and its frame to produce virtual spaces that become a mode of communicating these value systems. [Figure 4]
The gaze plays and integral role in this process where painted figures, viewers, spectators and spectators are bound by it. Ovid writes about this relationship and it is further interpreted by Verity Plat: “we are actively implicated in the event which we behold.” (Plat, 2002:87) In other words, the viewer’s experience of the image and of VR is not passive. Each style performs in its own way to create an immersive experience that speaks to its respective contemporary society where the act of viewing and the gaze produce the immersion and the dissolution of the virtual with the real. [Figure 5]

Returning to the notion of memory. As print and written word were not common at the time of Ancient Rome, people generally had to rely on exercises of memory for story telling and oration. Maggie L. Popkin writes about how objects in the public realm acted to create a collective memory and provide a sense of identity, through the spectacle of the monument. Additionally, they would use the architectural space of the villa and the frescos within. Frances Yates describes the two methods of memorization in The Art of Memory, drawing upon the work of the Simonides who is supposed to have invented the art of memory according to Cicero. Yates explains that there are two types of memory: natural and artificial and the artificial memory can be trained through the use of art and architecture. First someone would have to imprint a place on the memory and then associate images. Either images could be used to remember things- to remember an overall argument or story- or they could be used to remember words, the latter being more difficult as it requires more images. (Yates, 2014) “Romans possessed not only a sophisticated literary discourse about memoria but also robust practices of commemoration in art and architecture … Statues, paintings, coins, monuments—these visual media were all part of the memory related practices of ancient Rome, and we can thus analyze how art and architecture functioned as

Figure 5. Axonometric of room 5 at the Villa dei Misteri showing the VR immersive space (credit: author).
mnemonic devices within the specific social setting of Rome." (Popkin, 2016:13) The significance of this is that frescos in a villa were used in this way. A viewer would walk a particular route through the space and associate a memory with each of the images that would then convey an overall story. This method ensured a correct order since it was fixed to the spatial layout of the villa and the object/painting association provided an anchoring point for the memory. Moving through the villa and viewing the images in a different order produces a different memory narrative, which transcends the linearity of written text and gives it spatiality. These narratives could evoke discussion on moral questions and larger social issues in addition to the literal story they told. Ultimately, the space becomes a virtual theatre for memory (or a memory palace) and becomes bound to the individual- an extension of the self, a part of identity. (Bergmann & Victoria, 1994) These villas and their frescos allude to the importance of the moving spectator (brought into the immersion via the gaze and the constructed narrative) in the layout of the visual and psychological experience of the space. [Figure 6]

3. Application
Applying these aspects to the fresco room of the Villa Livia and Room 5 of the Villa dei Misteri provides insight on the virtual reality space of the ancient Romans. Both of these frescos have a rich history and show the importance of dining and entertaining for social and political discourse. This has to do with the correlation of image and memory as well as the use of the fresco to create an immersion where the limits of the room and painted space are blurred. In the case of Room 5, this is taken to new heights as the space is theorized to have been used by a Dionysian cult and the virtual reality speaks to notions of subjectivity and feminine empowerment. (Gazda, 2000)

The Villa Livia [Figure 2], it is situated north of Rome at Primaporta and belonged to Livia Drusilla (wife of Emperor Augustus). The space where the fresco was originally housed was subterranean which helped regulate the temperature- making it cooler than the outside- and providing a sort of whimsical oasis with an assortment of plants and animals painted. This “garden room” shows the extent at which the artist took careful attention of nature, observing how light falls on and wind blows through trees and how birds move and situate themselves in landscape. (Grau, 2003) As mentioned previously, the fresco is done in the second style and uses atmospheric perspective and this is evident in the way that a foreground and background is created through the emphasis and colour shading of particular surfaces in the scene. The artist has created a fence with entrances into the garden space which produces different frames or layers within the planar surface of the room- the space of the patio which includes that of the real, the grassed garden, and the wild tree
and mountain landscape. The image depicts an artistic representation of fruit trees, birds and flowers that is realistically impossible as they are all at their prime moments— they are flowers and trees that would not have flowered or given fruit at the same time in reality. [Figure 7] It produces an immersion into the fantastical and serves as a backdrop for calm contemplation for Livia and her guests, truly a country home getaway from the busy urban environment of Rome. (Grau, 2003)

Moving to Room 5 of the Villa dei Misteri, we see a very different mode of immersion employed. [Figure 8] In this case, landscape is not painted and the figure is crucial to the purpose of the room. It also serves a very different audience but similarly is a dining space reserved for special members of the household and their important guests. The villa dates back to 60 BC and was preserved during the Pompeian eruption of Mt. Vesuvius in 79 AD. Only part of the villa has been excavated, including room 5 where we find the Dionysian Fresco. (Maiuri, 1960) [Figure 6] There are many theories that surround this fresco but there is a compelling one that supports this notion of this space as a virtual reality. (Gazda, 2000)

The fresco shows an initiation ritual process for the Cult of Dionysus, specifically showing the marriage to the God, and illustrates the many steps the initiate must go through. It is presumed
that the space was used to show the process to women who wished to become a part of the cult. During the time period, it was common for women to join different cults to the Gods and Goddesses, thought to help with marriage, procreation, harvest and protection in the afterlife, though they were not necessarily encouraged by the Roman government. It was a way in which women could improve their societal status in a largely patriarchal society. (Gazda, 2000) What is evident in the fresco is the overwhelming use of the female figure that shows spiritual growth and, in a way, female empowerment. Two levels of subjective experience can be read through the space- the depiction of the initiate represented in multiple scenes of the fresco (she is shown 7 times) and the actual initiate who would be viewing it. [Figure 9] We see her evolution segmented through the narrative of the fresco- going from a shy initiate, maiden, to a confident priestess, matron (Little, 1972)—and can imagine the actual initiate’s evolution within the space as she becomes inducted into the cult. The series of scenes show the initiate in several phases that Vittorio Macchioro also describes in his text *La Villa dei Misteri in Pompei*.

The figures are drawn life-size and like the walled alcove spaces depicted at Villa Livia, the artist of this fresco creates depth at certain points throughout the scenes. [Figure 8] It is essentially a 360-degree panorama with a window on one of the walls that looks out to a veranda and a main opening that would have given a view of the Bay of Naples. [Figure 3] As mentioned previously, there is a band left at the base of the wall that acts as an optical illusion extending the floor area and raises the figures such that those reclining or occupying the space of the room do not obstruct the view of the fresco. The gazes of the figures bring focus back towards the centre of the room where the action was taking place between occupants of the space. [Figure 8] In this sense there is a theatricality of the space where the occupants are included in the scene supporting the notion of this place as immersive. (Dietrich, 2019) Bettina Bergmann writes about the use of masks and ritual offerings, specifically looking at the example of the Frescoes from Boscoreale, but we can also apply her texts to the Room 5 frescoes. She states, “masks and ritual offerings operate as ‘shifters,’ transition points between realms.” (Bergmann et al. 2010:29) In the fresco at the Villa dei Misteri, both masks and ritual offerings can be seen that allude to different points of transition for the initiate. These elements are especially important as they show different mental states or transitions (not only in the space of the fresco but in the process of initiation) illustrated by symbolism seen in examples such as the scene where the initiate appears afraid, pulling the shawl around her, and her hair in the scene where she is making the offering (as compared with her hair at the end). [Figure 9] In the first example, this scene represents the confusion of new sensorial experience. The way in which her hair is styled is symbolically significant- this represented thoughts. In the scene where she is making an offering her hair is hidden by a cap indicating her hidden thoughts. However at the end when she is preparing for marriage to Dionysus, her hair is being rearranged, her thoughts reorganized according to her new point of view after successfully going through the rest of the ritual process. (Fierz-David, 1988)

Like other frescos, these would have served a memory purpose where viewers could link the processes of the ritual to the images linking the metaphorical to the real. The actual initiation would likely not have taken place in this room so the images serve as representations rather than

---

*Figure 9. Sequence of scenes of the Dionysian fresco at the Villa dei Misteri (credit: author).*
actual instructions. Additionally, like other frescoes, the narrative provided by the images could be linked to intellectual and moral discourse. (Bergmann & Victoria, 1994)

The Cult of Dionysus was eventually forced to go underground- hence the name the Villa of Mysteries and why so little is known about this Dionysian cult. One reason for this was because of how powerful these types of spaces were as a social and political mixer. This cult provided a space where the mixing of classes could occur (slaves, citizens, etc.) and the frescos and meetings provided associative images that fuelled political discussion between these varied classes, which was dangerous for the Roman Republic and why they banned the cult. (Fortunato, 2017)

Ultimately, “[t]hese paintings speak to us today because they are about experience and perception, and just as Roman inhabitants did, we can place ourselves within their finely crafted illusions. With exposure over time, the painted interior promotes different modes of seeing and being in space, in this case a space also inhabited by gods.” (Bergmann et al. 2010:32)

4. Discussion
VR spaces today, whether digital or not, also have the potential to promote a different way of seeing, understanding and being in space. And we see a few examples of this type of use when considering applications in medicine and rehabilitation- dealing with subjectivity and subjective experience- as well as contemporary attempts to redefine collective space in VR. We are also seeing more study into how these spaces can be used for more sociable purposes and to promote the sharing and development of discourse- as spaces of knowledge production and co-operative design (whether in art and architecture or politics). However, there are still exciting possibilities that can be learned from the historical that we see less of in the contemporary such as the association of memory, narrative and intellectual discourse- specifically this connection with the “image”. VR spaces in history provided a social forum that supported the storage, retrieval and interchange of knowledge as well as a tool to inspire and encourage discourse and produce collective memory; they used the images to spark this discourse. It is for this reason that analyzing these spaces provides valuable insight as to how we might rethink and re-evaluate the design of VR spaces today, leading us to interrogate how the image and the VR space can help facilitate the production of knowledge and the construction of collective memory and identity.

By studying these frescoes we are able to understand the culture and what was valued at the time period. In a way, we can be immersed into these values by using these virtual realities, placing ourselves as subjects for the experience. As with Ancient Rome, objects and representations create a collective understanding of a historical context. Popkin elaborates upon this in the space of the Ancient Roman public realm, identifying how the Triumphal monuments produced a collective memory that immersed Romans into a perception of the Republic as a space of democracy and power. We can look back at these monuments and understand that they represented a show of power and nationalism, illustrating the societal contexts of the time period. (Popkin, 2016) Each society has its own represented forms of immersion using the respective technologies of the time that incorporate ideas of perspective, illusion and the spectacle. The virtual reality representations demonstrate how storytelling and narrative associated with the images and their respective memories played a crucial role in society and the production of knowledge and discourse. While they clearly show the strong influence of the belief in Gods and mythical characters on the people, they also clearly draw the attention back on these very people, putting them at the centre and placing value on the interaction propagated within. They set up a stage for action, embracing theatricality. The use of atmospheric perspective and various framing techniques produce depth and spatial contrast that was meant to dissolve the boundaries of the wall and the room. Similar to other virtual reality spaces that came after, they used panoramic techniques that surrounded their viewer.
5. Conclusion
Much of what these predecessors achieved can be likened to the virtual reality spaces produced today. However, instead of walls, we have devices, and instead of paint we have pixels—simply different technologies and tools of producing the same. The boundaries created by the walls of the room are redefined, the frame being an integral part of this. In fact, we can argue that these historical examples were in ways more complex since they provided architectural mnemonic to create memory palaces through the virtual reality associations. The success of this was predicated on the notion of movement through space and active involvement of the spectator, immersing them within the scenes. While contemporary society has yet to truly capitalize on the power of the virtual reality space to produce intellectual discourse, we can learn from these early examples and take a cue from them as social time capsules, leaving behind important insight into the social workings of their respective histories. We are starting to see a shift in the ways in which contemporary VR is being used. Like Gund.Io, these spaces are being produced for more collective purposes that demonstrate a desire to provide access to new public civic space. What will the virtual realities of today say about our society and discourses? What memory palaces could they present, preserving discourses and inspiring new ones? And how can we think of the virtual reality as an opportunity to become an extension of the self through new practices of memory and place making? These are questions that demonstrate the value of studying the lineage of virtual reality spaces and examining their roles, methods, and uses. These questions illustrate how nuanced early virtual reality spaces were, not simply utilized as spaces of spectacle but as devices for the production of knowledge and identity, both individual and collective.

Funding
The author received no direct funding for this research.

Author details
Tatjana Crossley
E-mail: Tatjana.crossley@gmail.com
ORCID ID: http://orcid.org/0000-0002-7902-0674
School of Architecture, Chinese University of Hong Kong, Hong Kong SAR.

Disclosure statement
No potential conflict of interest was reported by the author(s).

Citation information
Cite this article as: What constitutes the virtual: representation and memory in ancient Roman frescos, Tatjana Crossley, Cogent Arts & Humanities (2022), 9: 2139806.

Notes
1. This is an argument made by Oliver Grau in Virtual Art: From Illusion to Immersion. Though it is an argument he ultimately borrows from others such as V. M. Strocka and K. Schefold when speaking specifically about wall paintings in Pompeii, also a focus of this paper.
2. Studies show that even people that are blind or vision impaired create mental images based on the other sensorial experiences they detect to represent and operate in their given environment. This is a sentiment put forward by the philosopher Denis Diderot in the 1749 “Letter on the Blind for the Use of Those Who See”. It is also later reiterated by the psychologist Paul Schilder in his The Image and Appearance of the Human Body when he states that even people without optical capabilities process sensorial information in an optic representational way (confirmed by studies conducted by the experimental psychologist G.E. Muller).
3. The term image is used loosely here, not limited to modes of visual perception but also including an understanding of experience formed through other sensorial attributes (re: note ii).

4. However, taking into consideration the research done by cognitive scientists such as Anil Seth, we could argue that all experience is simulated and our experience of “reality” is merely a mental approximation based on perceptual stimuli received from the sensory organs. So using that understanding, all experience is virtual.

5. The author has completed previous work on the body image and subjectivity in immersive space: Crossley, Tatjana. The Dissolution of the Body Image. PhD Dissertation, Architectural Association, Open University. (2019).

6. Verity Platt and Michael Squire discuss the significance of the frame in these two villas in the text The Frame in Classical Art, A Cultural History.

7. Bettina Bergmann discusses how the Roman House was a memory theater using this case study in her text The Roman House as Memory Theater: The House of the Tragic Poet in Pompeii.

8. This may seem contradictory to notions of the frame put forward by Jacques Derrida (The Truth in Painting), Georg Simmel and Immanuel Kant (Critique of judgment) where the frame defines and creates separation as to avoid a dissolution of the art and placing it at a distance whereby it can be enjoyed. However, Platt and Squire argue that Graeco-Roman notions of frame question this and allow us to examine the applicability of that framework beyond modern western cultural perspective. This text argues that the frame is crucial to the virtual reality even though VR requires a level of dissolution of the self into the space because of the fact that immersion into an experience of space requires bounds.

9. The frescoes were removed, restored and installed in the National Roman Museum.

References
Bergmann, B., & Victoria, J. (1994). The Roman house as memory theater: The house of the tragic poet in Pompeii. The Art Bulletin, 76(2), 225–256. https://doi.org/10.1080/00043079.1994.10786585
Bettina, B., De Caro, S., Mertens, J. R., & Meyer, R. (2010). Roman frescoes from Boscoreale, The villa of publius
fannius synistor in reality and virtual reality. The Metropolitan Museum of Art.

Crary, J. (1992). *Techniques of the observer: On vision and modernity in the nineteenth century* (New ed.). MIT Press.

Damisch, H. (1994). *The Origin of Perspective*. MIT Press.

Damisch, H. (2002). *A theory of /cloud: Toward a History of painting* (J. Lloyd). Stanford University Press.

de Zuvillaga, N., & Javier. (2004). *GROPIUS. TEATRO TOTAL 1927*. Editorial Rueda (Ministerio de Vivienda.

Dietrich, N. (2019). Spatial dimensions in Roman wall painting and the interplay of enclosing and enclosed space: A new perspective on second style. *Arts Journal, 8*(2), 68. https://doi.org/10.3390/arts8020068

Fierz-David, L. (1988). *Women's dionysian initiation: The villa of mysteries in Pompeii*. Spring Publications, U.S.

Fortunato, M. (2017). *Villa dei Misteri, Pompeii guided tour.*

Gazda, E. K. (ed.). (2000). *The villa of the mysteries in Pompeii: Ancient ritual, modern muse*. The Kelsey Museum of Archeology and The University of Michigan Museum of Art.

Grau, O. (2003). *Virtual art: From illusion to immersion*. MIT Press.

Guida, G., Tian, R., & Dong, Y. (2021). Multimodal virtual experience for design schools in the immersive web. eCAADe Conference.

Little, A. M. G. (1972). *A Roman bridal drama at the Villa of the Mysteries*. Star Press.

Maiuri, A. (1960). *Pompeii* (trans. by V. Priestley; 11th ed.) Istituto Poligrafico dello Stato.

Oetterman, S. (1997). *The Panorama: History of a Mass Medium* (D. L. Schneider, 1st ed.) Zone Books.

Plot, V. (2002). Viewing, desiring, believing: Confronting the divine in a Pompeian house. *Art History, 25*(1), 87–112. https://doi.org/10.1111/1467-8365.00304

Plot, V., & Squire, M. (eds.). (2017). *The frame in classical art, A cultural history*. Cambridge University Press.

Popkin, M. L. (2016). *The architecture of the Roman triumph*. Cambridge University Press. https://doi.org/10.1017/CBO9781316217283

Seed, J. “Zhang Daqian’s reinvention of Wang Ximeng’s singular masterpiece”. (April 2022). Sotheby’s. https://www.sothebys.com/en/articles/zhang-daqians-reinvention-of-wang-ximengs-singular-masterpiece

Yates, F. A. (2014). *The art of memory*. Bodley Head.
