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A Study of 3D Graphic in Culture

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Abstract: *Ardabil, now known as one of the provinces of the country, has been one of the oldest and ancient cities in various historical periods, including Islam. This province comes to the end of the majesty and power during the reign of Safavid. Tombstone is among the heritage of the past that reflects culture and civilization. The existence of a tombstone on the tombs of Islamic period has always been observed in all parts of Iran. Though this issue exists in most cultures, it has always been considered by Muslims as an indicator of burial in the culture of the Islamic era and of Iran. The purpose of this research is to identify and study tombstone in the relevant area during the Safavid period. According to the results, the status of Shia religion can be clearly seen in all the tombstones of the Safavid period of Ardabil. In fact, it can be said that the combination of art and belief has caused the tombs of stone to be of particular importance and variety, and the line drawn on them represents the beliefs and cultures, as well as the scope of the literature of this region. Most of the designs include Islamic designs, flowers and leaves, animal designs and Quranic verses. The method used in this study is based on field study.*

Keywords: Ardabil, Safavid period, tombstone

Virtual simulations made using 3D graphics as a means of thinking and examining the complex problem of the epistemic implications of the 3D visual environment are to be found in the spirit of Aristotle, who believed that "it is impossible to think without an image"[1]. Such a dynamic between thought and reified form was echoed in Andrew Prescott's memorable speech at the Digital Humanities Congress. Prescott found the value and vitality of the digital humanities reflected in Harry Brearley's Industrial Revolution lab

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[1] Anne Shepard, *The Poetics of Phantasia Imagination in Ancient Aesthetics*, Bloomsbury Academic, 2014, pp.1-18.

and James Watt's workshop, cultivated spaces where effort, theorizing (thinking), and fabrication (reified forms) could meet[2].

The gaze is shaped by discipline, cultural prejudices, epistemic constraints embedded in an artifact and the material conditions in the context in which the experience of learning occurs. But it is also motivated by the scholarly intention to be objective, no matter how impossible, and to make every effort to understand without preconceived notions how matter might be observed.

In order to begin to understand some of the epistemic implications of forms of 3D graphic simulation, not only can we refer to these two types of knowledge, semiotic and aesthetic, but also in relation to 2D images and physical heritage objects. What are the implications of knowing when we look at a digital object compared to the direct study of the original object? What happens to our retention when a digital artifact has a vanishing point, an open space that fills around it, when we can manipulate the perspective from which we see a digital artifact in countless ways? How does our heuristic 3D rendering affect our viewing, our relationship to a digital artifact, and how do we explore it, which in turn affects the way we remember, think about, and know it?

We will refer to 3D and 2D images as digital artifacts or digital versions, although we are not fully satisfied with any of the terms, as they refer to epistemology. We are tempted to refer to them as digital descendants, with unique qualities and a life of their own. This term is problematic, but refers to excesses, commonalities, and deficits when digital versions are measured against their physical history. A term that has become commonplace in the 3D environment is digital surrogate. Bernard Fischer uses the term for 3D renderings of archeological sites, such as the impressive Rome Reborn[3].

Fischer's interest in 3D imaging is to build digital landscapes and vast spaces, so he uses the term surrogate, the virtual environment acting as a substitute or proxy, a substitute for an archaeological site or what it once was, like ancient Rome as a means of generating and testing hypotheses, fulfilling a specific epistemic function. Surrogate fits Fischer's needs, but does not speak as easily about the full range of epistemic considerations that can be explored, especially the excesses of a digital artifact that add to our knowledge in other ways and what their effect is on sight and knowledge.

[2] Andrew Prescott. 'Made in Sheffield: Industrial Perspectives on the Digital Humanities'. In: Clare Mills, Michael Pidd and Esther Ward. Proceedings of the Digital Humanities Congress 2012. Studies in the Digital Humanities. Sheffield: The Digital Humanities Institute, 2014.

[3] 2nd Italy-United States Workshop, Rome, Italy, November 3-6, 2003: The Reconstruction of Archaeological Landscapes through Digital Technologies, Organized by CNR-ITABC, Virtual Heritage Network, ECAI, University of California, Berkeley CDV,Field Museum of Chicago, UCLA Cultural Virtual Reality Laboratory.

It seems that Ségolène Tarte's impulse to call digital versions avatars is more appropriate, the digital version as an incarnation, the physical artifact passing over and in a digital form[4]. A digital version may not represent all the features of a physical artifact, but, as I mentioned, it also includes excesses. I appreciate Tarte's choice of the word avatar, his recognition that digital artifacts have excesses and exist in a different reality and with different rules and potentials, offering unique benefits and experiences, a recognition that I want to take forward in my sense of artifact or digital version. However, I will refrain from using avatars because in virtual environments, such as Second Life, it refers to a digital form through which a person projects his presence in a digital space, the most dramatic attribute of an avatar. Instead, it is desirable to stay focused on the kind of knowledge that an artifact generates when it has a 3D digital simulation, the excesses and deficits it involves; therefore, we will rely on the terms digital version or digital artifact.

The interpretive nature of sight and the speed with which the brain makes its interpretations should surprise us. It demonstrates how knowledge and meaning can be structured as quickly from what we believe we see (interpret as seen) rather than from what lies ahead. Magicians' illusions are a prime example. When we misinterpret visual data, we misunderstand. What we think we see, the way we interpret visual information in the retina, is the first thought that shapes our knowledge and has great epistemic consequences. Structuring the way we view and design interfaces for our digital artifacts that recognize that visual data is interpreted and what we see built is an important part of the epistemic question raised by 3D renderings and significant for 2D artifact images as well.

For a complex page designed as a page featuring the interlaced decorative motif of a medieval gospel – the page consists of an intricate web of elements, their bodies forming twisted knots of interweaving, some threads only three pixels wide – any additional visual information for a???. The brain's clue for analyzing visual data is beneficial. This page would provide an intriguing experiment, with two groups working to discover various obscure details and general patterns on the page, one using interactive 3D renderings and one using 2D images. Examining eye movement and the time required for different tasks would provide useful information for the development of 2D and 3D interfaces for viewing digital versions of cultural heritage artifacts.

Epistemically, page views change when each point becomes an epicenter for search. As a page rotates, the eye suddenly radiates in the

[4] Ségolène M. Tarte, *On Cognition and the Digital in the Study of Ancient Textual Artefacts*, E-Research Centre, University of Oxford Digital Classicist Seminar Senate House, London, 2014, p. 8.

direction of the tilt or vanishing point, opening a new heuristic. Compared to 2D images, the look is remade. The page margin loses some of its significance as a starting point. A page is no longer anchored on one side, as it is by tying a manuscript, or handcuffed on all four sides, because it is embodied as a 2D digital image. Instead, any feature that attracts attention or arouses curiosity becomes a starting point for an investigation, the beginning of a series of rotations and twists that lead to knowledge. A page is observed, discovered, and understood from this point, and as the page tilts and the perspective changes, the words, decoration, and images are constructed and reconstructed in the visual field. The brain accumulates a multitude of images, a collection of visual information, from which to process its knowledge.

Interactive 3D renderings release the aesthetic experience of researchers to direct the query in a way that is not so easily available otherwise. While a physical medieval manuscript allows you to look over a page, it is awkward to manipulate yourself or a manuscript into positions to allow any point to be the origin (epicenter) to look over, especially for a large manuscript or in a delicate state. Such a view places viewers in relation to a page, in some respects, similar to that of the artists or writers who made it, who looked at the page as it ran, from each point touched by the brush or feather, the design radiating from it. As each point becomes an epicenter, in the interactive movement of the page, the changing perspective draws the attention on various aesthetic moments and allows the page's grandeur to unfold in a succession of modified forms and perspectives. The aesthetic experience of the page is realized and remade and ways of research are available for thinking, reflection and knowledge. This is the effect of 3D graphic simulation.

We do not want to overestimate or underestimate the significance of these research pathways as a heuristic and a path to knowledge. The way we approach and look at a page has been profoundly conditioned by the printing press. Increasing knowledge normally involves overcoming ingrained habits of thinking and looking. Our habits of viewing a page – from left to right, from top to bottom – have been conditioned by printing (for good reason) and transferred to the screen as shown in the menu bars. The appearance of the pattern left a deep impression, even in our language habits. When we say 'on the page', we normally mean from left to right, by taking the horizontal direction, as is the case of crossword puzzles. Web viewers, such as the Google Map API, allow diagonal movements. However, these movements do not generate a point of view; they allow you to traverse a surface rather than to have a glance at a location in the image. As the eye moves on a page, capturing information, there is no ready point or perspective from which to relate and think. In a 3D rendering, there is such a point, one in which to place other features of the page in relation to or in dialogue with for analysis

and knowledge. Having the ability to make any point an epicenter, this point becomes the point of reference, the moment of the page, the design feature with which the rest is measured, associated with a way to search, see and create meaning. 3D renderings generate points of involved interest, positions from which to move.

While digital humanities depend heavily on science and its advances in computer technology, this type of science has a way of going back to our deepest humanistic roots, the ways of knowing that make humanities the complementary discipline to the sciences that are. In a long line of philosophers, from Emanuel Kant to Martin Heidegger, Theodor Adorno and Maurice Merleau-Ponty, Hans-Georg Gadamer sees humanities as differentiated from sciences by knowledge, by aesthetic experience. For Gadamer, recognizing the central role of the human element, with all its complexities, is what allows the humanities to know his knowledge[5]. The aesthetics of a culture, embedded in artifacts, is the essence of the way of being of a culture, condensed and distilled, the elixir with which a culture propagates and reinvents itself. As far as knowledge is concerned, Maurice Merleau-Ponty is not completely wrong when he says, "Science manipulates things and gives up living in them."[6] Humanities are about the perception of things and the lived experience.

Because epistemology refers to 3D renderings, we focus on two types of knowledge generated by the gaze, knowledge through semiotics and knowledge through aesthetic experience. While we have focused on knowledge through aesthetic experience, knowledge through semiotics has been a major driving force in digital humanities, especially in the field of text, starting with the generally accepted initial story of humanities, with Father Roberto Busa's approaching of Thomas J. Watson from IBM in the 1940s to develop an index verborum for the corpus of Thomas Aquinas. Digital projects with textual concerns have reinvented what we might know. For example, the Great Parchment Book Project[7] produces readable 2D images of the fire-damaged parchment manuscript, a manuscript that transcends the hope of being digitized[8]. Part of this project involves digital

[5] Abhik Roy & Oludaja Bayo (2011) *Hans-Georg Gadamer on Praxis and Hermeneutical Understanding*, Comparative Literature: East & West, 14:1, 27-42, DOI: 10.1080/25723618.2011.12015553.

[6] Maurice Merleau-Ponty, *The Primacy of Perception*, Northwestern University Press, 196 4, p. 19.

[7] http://www.greatparchmentbook.org/

[8] Reading damaged fire manuscripts is often very difficult due to the fragile nature of the texts and their distorted form. We present here an award-winning project (SUCCEED Award, UNESCO Memory of The World Status) between London Metropolitan Archives and University College London (Department of Computer Science and UCL Center for Digital Humanities), in partial collaboration with ETH Zurich, which allowed virtual flattening and the digital restoration of The Honorable The Irish Society's Fire Damaged Parchment Manuscript, exploring how advanced digitization methods can help read fire-damaged texts

flattening through 3D graphics strategies. Such projects demonstrate the profound impact of 2D imaging on science and knowledge, with the ability of 2D imaging to increase access, preserve digital, and enhance visualization (through resizing, clarity, and multispectral imaging). These skills speak about the substantial contributions and excesses of 2D imaging to knowledge – especially in the field of recovering what is no longer visible through ultraviolet and infrared images.

However, 2D images, even when the text is the intended feature, generate epistemic concerns, as Melissa Terras recently addressed in "Artifacts and Errors: Acknowledging Issues of Representation in the Digital Imaging of Ancient Texts"[9]. One of Melissa Terras's concerns is her addiction to digital representations and her possible lack of training for new scientists in examining physical artifacts. Will digital versions cause researchers to lose touch with, have amnesia, or misunderstand physical artifacts? Starting with Gadamer, Dennis Schmidt states that images, especially art, "educate our eyesight and understanding"[10]. He gives the example of the earth that can never be seen in the same way after being photographed on the moon. My hope, of course, is that we make concerted efforts to keep new scientists in touch with physical artifacts. But we must recognize that digital practices have revived his studies and practices for knowledge generation. The stock market and our appearance are and will be changed forever due to digital efforts.

One of the excesses of digital versions, whether 2D or 3D, is that sooner or later they will represent their antecedents better than the antecedents themselves represent, as in the case of medieval manuscripts, when their inks and pigments continue to fade, to deteriorate their support gelatinizes. In the future, we will have an epistemic crisis. Digital images preserve the way in which a cultural artifact was represented at a certain point in time, by a certain technology. Strangely, then, digital representations have increased their value on the stock market over time, keeping the way an artifact once appeared, even after the artifact was seriously damaged. I think Melissa Terras is right when she addresses the current issues of digital representations for these future concerns[11].

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like this. By developing an acquisition workflow to digitize the text, backed by a preparatory preservation treatment, and then by developing software to explore and flatten documents, there is the ability to reproduce new digital images of the document that helped transcribe the text.

[9] Melissa Terras, *Artefacts and Errors: Acknowledging Issues of Representation in the Digital: Imaging of Ancient Texts*, Kodikologie und Paläographie im digitalen Zeitalter 2 / Codicology and Palaeography in the Digital Age, 2011, p. 4.

[10] Dennis Schmidt, *Between Word and Image: Heidegger, Klee, and Gadamer on Gesture and Genesis*, Indiana University Press, Nov 14, 2012, p. 104.

[11] Melissa Terras, *op. cit.*, p. 6.

For digital projects, we need to think carefully about what is worth placing in the conceptual space of the scholarship screen. For text, much of the conceptual space of the page works as a negative space, to make the letters as visible as possible for the meaning of their direction. However, this is just a use of the conceptual space of the page, quite different for the illuminated manuscripts. Artifacts such as the medieval Gospels created in the monastic space of Moldova reorganize the universe around their aesthetics, an aesthetic of light, one dominated by religious doctrine, but also well informed by the artistic heritage of their culture. The decoration of these grandiose manuscripts of the Gospel, the experience of the decorative motif entrelacs provides clues for understanding the text and wider expression. For the medieval Gospels of Moldova, the conceptual space of the page is anything but negative space.

The cultural artifacts and features that scientists want to capture and represent to create meaning will generate the standards and urgency for how an artifact is captured and presented digitally. However, 3D graphic simulation is a break from our habit of thinking of the page as a flat surface, reminding us that the page is a conceptual space, one with horizons and vanishing points, embedded in the aesthetics of a culture. 3D images generate different types of knowledge. Over time, we will better understand the effects of 3D on knowledge and how academic knowledge reacts and evolves, the heuristics that 3D inspires, and the types of knowledge it generates, which is certainly different for different types of cultural heritage. 3D artifacts open up new potential for interactivity, in the best sense for web accessibility, and the learning involved, which is meaningful for teaching. How 3D graphics simulation influences academic practices, ways of knowing and generated knowledge is an answer we need to give to the future. However, as digital humanists, I believe that we should leave digital artifacts for the future that are as saturated as possible with data. When scholars and artists made the Gospels in Moldova, I doubt that any of them considered this great book of the Gospel to have survived two hundred years. Some of our digital artifacts will probably survive for two hundred years. We know that we may prefer those that have saturated information in 3D graphics simulations.

The source of concerns for the cultural, digital recovery of manuscripts from medieval Moldova can be found in the research undertaken during his doctoral studies, under the guidance of the distinguished Professor Tereza Sinigalia. We have discovered a galaxy of heritage values insufficiently known today, outlining an era of cultural grandeur materialized by our predecessors. In respect of this exceptional artistic episode, we propose the initiation of 3D digitization of these manuscripts, which would preserve for posterity a strong artistic voice – of the Moldavian artists from the Middle Ages.

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