ART-HISTORICAL EMPIRICISM AND DIGITAL VISUALIZATION OF CULTURAL HERITAGE[*]

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Digital visualizations of historical artworks and other objects of cultural heritage (hereafter DVCs, short for 'Digital Visualizations of Cultural Heritage') are increasingly becoming a standard fare at museums of art. One comes across them via touch screens, video projections, or VR headsets, and they serve as models for 3D prints. They have also been making inroads into archaeological, conservationist, and (albeit more slowly) art-historical scholarship (Brown, 2020; Lewi et al., 2020). Typically, DVCs are used to re-create or re-imagine artworks in their original state, or they let one explore and manipulate them in

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ways not available or permissible in the case of their originals. Advances in 3D scanning and modelling, non-invasiveness, reversibility, and easy manipulation make DVCs more efficient options for restoring or exploring cultural heritage than invasive restorations or the use of reproductive techniques like plaster casts (Bentkowska-Kafel, 2013; Drucker, 2013; Whiteman, 2021; Cohen, 2022). At the same time, their apparent efficiency raises questions about their relation to the historical artefacts: What is the visualizations' status vis à vis the originals? Can they replace them? And if so, in what capacity?

In the following, I explore these questions from the point of view of the DVCs' potential epistemic yield. I propose that the best way to understand DVCs as tools of knowledge is to approach them as 'epistemic images' and that their role as such is derived from their modelling what they depict (I). I argue that the knowledge they are supposed to provide amounts to mediating past experiences the artefacts they model occasioned and that in this role they serve an agenda with a long pedigree I call 'art-historical empiricism' (AHE; II). However, historicism about perception can sow doubt into the AHE enterprise, including the use of DVCs as epistemic images. I maintain that if AHE is to justify or guide the DVCs' proliferation in museums and historical scholarship, its proponents better be equipped with means of assuaging the doubt (III). I then suggest a general strategy of testing the soundness of epistemic uses of DVCs (IV) and I close by sketching further implications that follow from the presented line of argument (V).

I. DVCs as Epistemic Images and Virtual Models

In this paper, DVCs will be of interest insofar as they function as 'epistemic images'. An epistemic image fosters insight into what it depicts that would not be available by studying

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the latter.[1] DVCs do not always have the function of epistemic images, as when they are used merely to reproduce the looks of their originals (as is often the case with various virtual museum tours) or when they only provide stimulating environment for learning by other means (as is sometimes the case with museums' 'gamification' and 'edutainment' strategies). My aim is to analyse DVCs' nature as epistemic images and to assess their potential as sources of experiential knowledge.

What follows are three examples of practices that involve DVCs as epistemic images.

(1) Between 2010 and 2013, a team of scholars under the leadership of Bernard Frischer undertook a study of an over-life-size statue of Caligula (*c.*40 CE) in the possession of the Virginia Museum of Fine Arts in Richmond. One of the main objectives of the project was a digital restoration of the Richmond Caligula that would result in digitally supplementing its missing parts (mainly its arms, left foot, and nose) and restoring its original polychromy. The statue's 3D digital copy was created using laser line scanning; photo-induced luminescence imaging helped record traces of pink/red and blue pigments in the toga folds, traditionally used to produce the imperial-coded colour purple; and comparative art-historical analysis led to a suggestion of the missing arms' shape. The collective effort resulted in three digital models of the Richmond Caligula's hypothetical original

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[1]On the concept of 'epistemic image', see Daston, 2015, pp. 17–18: 'An epistemic image is one made with the intent not only of depicting the object of scientific inquiry but also of replacing it … An epistemic image earns its name by translating abstract epistemological priorities into concrete pictures.'

appearance. The three models are identical except for differences in possible polychrome finish (Schertz and Frischer, 2020).[2]

(2) The cave temples of Xiangtangshan in China's Hebei Province were carved during the short-lived Northern Qi dynasty (550 – 577 CE) and represent one of the pinnacles of early Chinese Buddhist art. During the tumultuous first decades of the last century many parts of the caves' sculptures and reliefs, mainly heads and hands, were sawn off by looters and sold to art collectors and dealers across the world. Beginning in 2003, a team based out of the University of Chicago's Center for the Art of East Asia and lead by Katherine Tsiang carried out the painstaking project of locating the fragments and matching them with their original placement in the caves. Importantly, this was greatly facilitated by scanning both the caves on site and the fragments in the possession of various museums and collections and then matching them in a virtual environment. The project culminated in the travelling exhibition *Echoes of the Past: The Buddhist Cave Temples of Xiangtangshan,*[3] which put on display some of the fragments, but also 3D prints, touchscreens with digital models, and a 'digital cave', a 3-channel video visualizing the North Site South Cave with the 'returned' fragments.[4]

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[2]To examine the models and documentation, see

http://www.digitalsculpture.org/caligula/index.html.

[3]Smart Museum, University of Chicago, 2010 – 2011; Smithsonian Institution, Washington, DC, 2011; Meadows Museum, Dallas, 2011 – 2012; San Diego Museum of Art, 2012; Institute for the Study of the Ancient World, New York University, 2012 – 2013. See Tsiang and Born, 2010.

[4]To examine the models and learn more about the project, see https://xts.uchicago.edu/.

(3) The video games *Assassin's Creed Origins* (Ubisoft 2017) and *Assassin's Creed*

Odyssey (Ubisoft 2018) were generally praised, including by experts, for their historical

veracity in depicting the games' playing environment, set, respectively, in Cleopatra's Egypt

and on the Greek Peninsula during the Peloponnesian War (Politopoulos et al., 2019;

Casey, 2021).[5] The games' developers consulted archaeologists when re-creating the

famous sites of Mediterranean antiquity, with the aim of restoring ancient monuments and

their environs to their original state (Reinhard, 2019). To underscore their commitment to

historical veracity, Ubisoft released educational modes for both games, inviting those who

had already purchased them on free guided tours through the virtual universes (Reparaz,

2018; Maguid, 2019).

These three examples demonstrate the function of DVCs as epistemic images. They are

not virtual replicas; they do not serve merely to reproduce existing artefacts or structures.

Rather, they re-create or restore their originals, offering more or less tentative

approximations of their appearance. But even when DVCs reproduce existing artefacts –

such as the digitized individual Xiangtangshan fragments – they often play the role of their

models rather than merely identical reproductions. They lend themselves to manipulation

that would not be possible or permissible in case of the originals: one can play with their

scale, viewing angles, or experience them in environments not available for their originals.

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[5]An instructive 'playthrough' by Leiden University archaeologists is also available at

https://www.youtube.com/watch?v=HEtDa3Z-

r2I&list=PLKbRwyeu6RQuwTuZ3CCeI2nxrFZ4SndP7.

They are props that help model various otherwise unavailable scenarios involving interaction with the artefacts.

The DVCs' function as epistemic images depends on their potential to model objects of cultural heritage. And it is in virtue of their character as images that they can play the role of models. So what is it about them as models that makes them *epistemic* images? They are not epistemic images simply because they model cultural heritage objects for, in one sense of the term, all pictures are, or contain, models. As Alva Noë (2012) reminds us, a model is a substitute, a representative standing in for something absent: 'models are tools for thinking about or investigating or perceiving something other than the model itself' (p. 99). These include models that are specimens of what they represent (for example, a car model) as well as models whose very function depends on having a different scale from what they stand in for (for example, maps, architectural models, chemistry models; pp. 97–98). One is in need of a model when one lacks appropriate or efficient access to what one wants to explore. According to Noë, there are no intrinsic properties that make a thing a model; whether it is a good model depends on how well it serves in representing the characteristics or relationships one wants to have access to. But how well it represents *those* characteristics does depend on its properties (pp. 99–101). And pictures, Noë claims, are visual models; they are tools configured for a specific communicative setting (p. 105) and with 'our particular and cognitive capacities in mind' (p. 103) to instantiate 'the look or appearance of a thing or situation' (p. 104).

The trouble with Noë's model-based picture theory is that it does not help distinguish between pictures whose function is to reproduce and thus convey the appearance of what

they depict, that is, mere replicas, and properly epistemic images, that is, pictures that convey knowledge that the study of the originals would not. Fortunately, Robert Briscoe (2016) comes to the rescue. Like Noë's, his picture theory also operates with the concept of model. According to him, whatever else pictures are or do, they present models in virtual space. These virtual models, like models in general, are 'designed to share certain visual appearance properties with' what they are models of (p. 46), yet they are not of the same artificial or natural kind (p. 47). Often, they are designed so as to play the role of 'iconic representations' or 'icons', referencing the looks of their originals in their stead (pp. 47–48). But, crucially, not all pictures are icons, that is, not all serve to convey appearances of originals in their absence. The overlap in some visual features may allow models (including pictorial models) to stand in or substitute for the functionality of their originals. This is so when models are used as dummies, decoys, or when they are meant to generate the emotional, aesthetic, or symbolic effects of the originals (p. 48).[6]

The difference from Noë's account is not just that Briscoe distinguishes between iconic representation and substitution (whereas for Noë all pictures are substitutive models), but also that he identifies models not with pictures as such, but rather with their figurative, virtual content. This makes his theory more fitting for an account of the DVCs whose virtual space may be accessed via variety of media, including virtual reality headsets that, at least on some accounts, do away with surface awareness and thus are not pictures in a strict sense (comp. Tavinor, 2022, chap. 4; Marchetti, forthcoming). Incidentally, describing DVCs as epistemic 'images' rather than 'pictures', as I have done, has the added

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[6]As Briscoe is aware (p. 66), the argument can be traced back to Gombrich, 1963. See Stejskal, 2019, for relevant discussion.

advantage of underlining their nature as pictorial models in virtual space (what the Neo-Husserlians call 'Bild-Objekte' or image objects) rather than material vehicles of depictive content ('Bild-Träger' or image carriers; see, e.g., Wiesing, 2009; Pichler and Ubl, 2014; Nanay, 2016; Briscoe, 2016).

I want to understand epistemic images as a species of Briscoe's pictorial models, which are not just functional stand-ins or substitutes for what they depict, but rather allow us to do more with them than would be possible with the originals. They are meant, by virtue of sharing some appearances with their originals, to provide insights that would otherwise not be available to their users. In the case of DVCs, this is typically because they are used to restore or re-create the objects of cultural heritage for which the images stand in. Thus, (1) the Richmond Caligula DVCs make perceptually available its possible polychromy and posture; (2) the 3-channel video of Xiangtangshan North Site South Cave simulates the spatial dimensions of the cave and the original placements of the sculpture fragments; (3) the *Assassin's Creed* video games digitally visualize the ancient monuments in their original environments.

II. DVCs as Remote Objects

What is the ultimate epistemic gain DVCs used as epistemic images aim to provide? What does one stand to learn about the past from restored or re-created cultural heritage objects? One way of cashing out the epistemic gain is to say that if we want to learn the reasons behind the production and reception of objects of cultural heritage, we will want to know why they look the way they do, especially when there are grounds for thinking that their looks had something to do with their public function – for example, when historical

sources tell us so, the objects demonstrate care given to their surface designs, or archaeological survey reveals their central placement in a public space. Or, to put the point differently, since the cultural heritage artefacts occupied a node in a web of relations composing a historical form of life, how they influenced or channelled these relations was likely determined to some extent by how they appeared to the historical actors. The promise of the restorative or re-creative work visualized by the virtual models is that we can gain access to these appearances or better understand the processes that made them available.

The DVCs' role as models helps explain their function as 'visual arguments' (in Cohen, 2022's terms) or visual manifestations. They translate into perceptual terms beliefs about the objects' appearances or effects on past audiences. This translation relies on and facilitates the current audiences' ability to experience for themselves how these artefacts could have appeared under historical circumstances other then their own. 'Experience' here should be understood as a 'what-it-is-like' state, a phenomenal consciousness of an object (Chalmers, 2018). The idea, then, is that the phenomenology of one's experiencing the DVC – what it is like to have a phenomenal consciousness of it – can cast light on the 'historical phenomenology' of the modelled artefact – what it was like to have a phenomenal consciousness of it.[7] The reconstructive work DVCs are used for thus aims at 'reconstructing experience' (Drucker, 2013, p. 11), or mediating past experiences. I prefer 'mediation' to 'reconstruction' of experience because I understand the former to be broader than the latter: translating into perceptual terms beliefs about objects' appearances or effects does not necessarily have to take the form of a reconstructed or re-enacted

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[7] On the possibility of a historical phenomenology, see Davis, 2017.

experience. Nor does it necessarily have to occur only by making available the original appearance of cultural heritage artefacts. Past experiences may be mediated also by developing visual models that would help make sense of the artefacts' perceptual effects, by visualizing them in their original surroundings, in their production stages, or, in case of perspectival pictures, modelling their figurative spaces in 3D.

Importantly, what is essential to any mediation (including restoration) of past experiences via DVCs is that one learns about what it was like to experience an artefact of cultural heritage through one's own phenomenal consciousness of its DVC, which, as an epistemic image, exploits to this end some of the artefact's perceivable features. DVCs play the role of mediators of past experiences as long as what they make accessible to perception is supposed to foster an understanding of what it was like to experience an object of cultural heritage in the past.

One may be tempted to conclude that mediating historical experiences is the reason why cultural heritage artefacts are subject to restoration or preservation. And it is an obvious truth that we want them restored or preserved because they are endangered by decay, whether natural (material dilapidation) or human-induced (wear and tear, intentional damage). But even a cursory look at why cultural heritage artefacts are subjects of preservation reveals that mediating experience is not the only, and often not the main motivation driving it. Other reasons often have to do with staying in touch with the past or preserving a sense of authenticity (the artefacts' age value [patina], relic value [non-fungibility], or genuineness; see Riegl, 1982 [1903]; Korsmeyer, 2019). Importantly, these

reasons do not necessarily aim at restoring the artefacts to their original shape or design, but rather at preventing their further dilapidation.

Let us call 'remote artefact' a material relic of the past that has survived to the present and 'remote object' an object whose looks mediate past experiences. It should be apparent from the previous discussion that a remote artefact may not always be a suitable remote object: there may be good reasons why one would want to conserve or restore remote artefacts that do not really concern their potential to mediate past experiences.[8] In other words, restoring or preserving remote artefacts may only sometimes be motivated by the intention to treat them as remote objects. Admittedly, my use of 'remote' equivocates between identifying something as coming from a temporally distant place (remote artefact) and indicating the potential to mediate culturally distant experience (remote object). However, in both cases remoteness is meant to identify a common problem: artefacts are remote because they are found lacking in their capacity to mediate past experiences due to their age – they are damaged or their context of use is lost – and remote objects are supposed to deliver the remedy.

In their way, DVCs can contribute to the preservation of remote artefacts' authenticity, as when they help generate interest in the original. Their capacity to be such facilitators may even issue from their role as epistemic images; they let one experience what remote artefacts might have once looked like and thus strengthen the bond to them (Matthes,

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[8]Which is not to rule out the option that there may also be good reasons for conserving or restoring remote artefacts that do concern the artefacts' potential to mediate past experiences; see Windsor, 2025.

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2024, chap. 5). But insofar as DVCs serve as epistemic images, they deserve the label 'remote objects' more than remote artefacts serving as relics. This is because with remote objects, what is at stake are responses to their appearances; what matters is that the object that one observes today retain or restore perceptible features of the original and not that it be numerically identical with it (comp. Sandis, 2016).

A reconstructed model of an Archaic Greek sphinx from the sixth century BCE became one of the highlights of a recent exhibition at the Metropolitan Museum in New York City (*Chroma: Ancient Sculpture in Color*, July 2022 – March 2023). The original sphinx' surface was analysed with the help of digital microscopy for traces of pigments by the Met's scientists and its 3D model was captured using photogrammetry. These data were then used to print the model using Plexiglas powder and to complete it using paint (Brinkmann, Koch-Brinkmann, and Peining, 2022). Although a modern-day reconstruction, this object satisfies the criteria of a remote object because it is meant to mediate past experiences, which it is supposed to do better than the original artefact. The reconstructed sphinx is thus not strictly a replica, but a remote object presenting an epistemic image. It is a tentative reconstruction of the sphinx' looks as it manifests a set of hypotheses and inferences about them. Furthermore, the Met also provided an augmented reality experience to the visitors by allowing them to project the sphinx' DVC to their surroundings using their smartphones or tablets' cameras and screens.[9] The digital visualization had the same claim to mediating past experiences as the 3D print and it hence also played the role of a remote object. Both the DVC and the 3D print (itself a materialization of a DVC) are the

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[9]See https://www.bluecadet.com/work/chroma-ar/. On the use of augmented reality in the context of cultural heritage, see Bekele et al., 2018.

remote artefact's models and since, for our purposes, a remote object mediates past

experiences through its appearance, they qualify as remote objects as well.

To claim that remote objects or epistemic images of remote artefacts mediate past

experiences amounts to committing to a position according to which an object originating

from a temporally distant culture can be used to approximate what it was like to respond to

or experience it in that culture. Typical examples of such objects would be those from the

deep past, but they can also be more recent, such as ethnographic objects from non-

metropolitan cultures. The assumption that remote objects can mediate remote

experiences of remote artefacts is the central tenet of what I label 'art-historical empiricism'

(AHE). Art and cultural historians have often instrumentalized art from the past as a means

of reaching past modes of experiencing or perceiving.[10] Such instrumentalizations have

typically embraced some version of the claim that by experiencing or attending to the art in

the right way we can attune ourselves to what it must have felt like to perceive it (and, by

extension, the world beyond it) in the past (Alpers, 1987, 115).

The claim (or, more often, the implicit assumption) is empiricist in the very broad sense

that one relies on what one perceives in order to learn things (Elsner, 2003, 106; Allen,

2021). In this case, what one wishes to know – to retrieve – is remote attitudes, responses,

or experiences. One commits to AHE when one assumes that the phenomenology of one's

experience – what it is like to have a phenomenal consciousness of a remote object – can

play a role in casting light on what it was like to experience the remote artefact in its remote

circumstance. I call this empiricism 'art-historical' to distinguish it from other kinds (e.g.,

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[10]Famous examples include Wölfflin 2015 (1915) or Riegl 2004 (1966).

logical [Creath, 2023] or aesthetic [Lamarque, 2010]) and in recognition of the fact that, traditionally, it has been a (if not the) main goal of art history to explain why artefacts from the past (typically paintings, drawings, sculptures) were made to look the way they do (Summers, 1989). These explanations are supposed to shed light on patterns of behaviour centred on the remote artefacts.[11] 'Art-historical empiricist' is thus anyone trying to learn from the look and feel of things from the past (or their models) about their efficacy and significance in their remote environment(s).

What makes AHE attractive is the promise that one's perceptual acquaintance with a remote artefact or its model will convey a sense of what it was like to experience it in the past. However, the empiricist claim or assumption should not be mistaken for a view that would regard one's experience of a remote object – understood strictly as an object that restores the original appearance of a remote artefact – as a sufficient source of insight into past ways of experiencing the artefact *tout court*.[12] First, the empiricist claim merely stipulates that it is justifiable and often necessary to enlist one's own experience of the

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[11]For a relevant discussion, see Rose, 2021, chap. 4. Empiricist elements have played an important role also in archaeology (e.g., Beazley, 1956) and anthropology (e.g., Boas, 1927) – wherever scholars have tried to ascertain with the help of direct experience of remote objects what must have been visually salient to their intended audiences – what has stood out to them in perceptual experience as significant.

[12]While such a position would classify as empiricist, it would arguably be difficult to defend it against claims that it is 'irrational' and 'misguided' (Panofsky 1955, 19). It would certainly not survive the vision-historicist stricture as discussed in Parts III and IV below.

remote object in learning about past modes of experiencing the remote artefact. It is compatible with AHE to treat one's own experience as a source of insight that complements, and is complemented by, other sources (e.g., textual, archaeological, or ethnographic; see Neer, 2010, 11–13). Second, using remote objects to approximate past experiences should be understood broadly enough to cover cases where mediation of such experiences is achieved not only or not mainly by restoring remote artefacts to their original glory. For example, one may be satisfied with remote objects' retaining or replicating only some of the artefacts' perceptual features: The Xiangtangshan digital cave prioritizes mediating a sense of the original spatial order and ambience above that of restoring fully the sculptures' looks. Or one may wish to manipulate or interact with remote objects beyond merely restoring the original artefacts' appearances: While the *Assassin's Creed* games aim at rendering convincing recreations of ancient architecture, a more important ambition is to provide an engrossing experience of the architecture as part of a lived environment. These restorations and manipulations fall within the empiricist use of epistemic images insofar as they rely, at least in part, on remote artefacts' restored or replicated perceivable features to convey what it must have been like to attend or respond to the artefacts.

III. Art-Historical Empiricism and Vision Historicism

From the point of view of AHE, the main epistemic yield remote objects like DVCs provide is learning about the effects remote artefacts' original or historical appearances had on observers. The possibility of such an epistemic yield is predicated on the assumption that one can create an epistemic image of a remote artefact that will mediate these effects with the help of one's perception of the image. A considerable complication for such an

ambition is the suspicion that historical remoteness puts one in danger of inadequately responding to objects' appearances. The suspicion informs a position that can be usefully dubbed 'vision historicism' (Davis, 2015; Rose and Nanay, 2022). Roughly speaking, it amounts to the claim that what and how one perceives or attends to is subject to local cultural influences such that cultural remoteness undermines the potential of any perceivable object to mediate a culturally remote experience. For the vision historicist, remoteness does not merely designate the need to mediate past experiences by restoring or modelling the remote artefacts' original perceivable state, but the condition when the artefacts' functional, artistic, moral, or symbolic context ceases to be readily available to one and the danger arises that one's responses to or experiences of their appearance will be unwarranted (Stejskal 2023, chap. 2; Mortu, Stejskal, and Windsor 2024). This danger may remain, the vision historicist insists, even when the artefacts maintain, or are restored to, their allegedly original shape or design.

Vision historicism can sow doubt into the AHE enterprise, including the use of DVCs as epistemic images. That is not to suggest that vision historicism is necessarily a hostile, outside challenge to AHE; it may be better thought of as a corrective that curbs unwarranted optimism about mediating remote experiences.[13] It primarily targets situations when remote objects are treated as straightforward and direct shortcuts to fine-grained remote experiences. If AHE is supposed to justify or guide the DVCs' proliferation in museums and historical scholarship, its proponents better be equipped with means of assuaging the doubt that vision historicism sows. How the tension between AHE's

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[13] Prominent art-historical empiricists have also been vision historicists; see Wölfflin, 2015 (1915), Riegl, 2004 (1966), or Baxandall, 1985.

optimism about mediating remote experiences and vision historicism's pessimistic corrective to it plays out hinges on at least two variables: (a) how remote the artefact in question is and (b) what kind of experience or response it is supposed to mediate.

(a) The more culturally remote an object is, the greater the danger that one may fail to register or appreciate all its relevant perceptible features in an adequate manner. An artefact's relative remoteness – the extent to which one has access to its original circumstances of production, reception, and circulation – will impact the status of perceptual experience as a source of insight about its function and meaning. On the one hand, the more remote the artefact is, the more important will whatever information one is able to glean from its appearance be, as it will be one of the few sources of insight available (see Stejskal 2023, chap. 5). On the other hand, if an artefact's original culture is so remote that we have not much else to go by than what archaeological surveys tell us, the conclusions we draw from our perceptual experience of them are in danger of bordering either on the banal or on unbridled guesswork.

For example, no one doubts that the famous monumental Olmec heads (*c.*1500 – 500 BCE) capture human (or human-like) physiognomy. But these objects are several thousand years old and they originate from a culture we know very little about. Given the dearth of information, one may be tempted to be guided in one's inferences about them by one's perceptual or aesthetic sensitivities. Indeed, art historians and archaeologists have often used their experiences of remote objects' appearance – usually informed, where possible, also by their histories of production, circulation, and reception – to generate or deepen insight into possible range of meanings that experiencing the remote object could have

been charged with. For example, one of the chief reasons Pasztory (2005) finds for her interpretation of the Olmec heads' naturalism as counting towards their being portraits of individual rulers, is that 'Realistic depiction works on the emotional level to create intimacy. The more realistic Olmec heads, for instance, are experienced as "closer" and friendlier than the stylized ones.' The strategy of the Olmec overlords in commissioning the monuments – their presumed portraits – was thus supposedly to make 'their rule appear accessible, personal, and perhaps inescapable' (p. 188). But one could plausibly argue that the association of naturalism with intimacy and psychological individuation is hardly universal and is the result of modern associations seeping into Pasztory's arguments. Baudez (2012), arguing against Pasztory on these grounds, has collected circumstantial evidence suggesting that the colossal sculptures might have been depictions of enemies' severed heads. Conjectures such as Pasztory's, based in part on personal impressions, thus come easily under criticism that they smuggle in anachronistic baggage informed by the observers' contemporary sensibilities – in short, criticisms based on vision historicism (Stejskal 2023, chap. 2).

(b) The second variable turns on what is understood under 'responses' or 'experiences'. In lieu of providing a discussion of the various ways these terms may be parsed out – which would require space far beyond that accorded to a paper on the epistemic import of DVCs – I will briefly introduce two philosophical accounts of encounters with remote objects; one provides grounds for pessimism about AHE, the other lends itself to supporting AHE's optimism. This will demonstrate that AHE comes in flavours, depending on what notion of 'experience' it is committed to.

Borrowing Michael Baxandall's distinction (1985, p. 111), Bence Nanay (2024a) argues that in experiencing artworks from remote cultures, it is virtually impossible to become a participant rather than an observer, where the former is someone fluent in appreciative practices that centre on the artwork within that culture and the latter is not. What prevents one from becoming a participant are two factors of our perceptual psychology. First, top-down influences affect our perception; what we know, believe, or expect has an impact on what we perceive. Different ways of enculturation will thus lead to different modes of perceptual experience (see also Raftopoulos and Zeimbekis, 2015). Second, one's perceptual history also affects how one perceives: One's past exposure to objects and environments influences what it feels like to perceive them so that one can be 'trained' by repeated exposure to see them in a particular way or notice differences that would be hard to spot for a novice (see also Gauthier, Tarr, and Bub, 2010). Because one cannot unsee what one has seen, it is difficult to revert the results of perceptual learning and hence difficult to attune oneself to sharing perceptual experiences with people from different cultures.

It is easy to see how this position – a version of vision historicism – tears holes into the ambition of using DVCs as remote objects and epistemic images. To recall, the promise of the restorative work visualized by the DVCs was that by virtually reconstructing some of the looks of remote artefacts we could gain access to their intended appearances and thus to what it must have been like to perceive them. But if to learn what it was like to experience the remote artefacts involves having a what-it-is-like state of their remote objects, this may turn out to be unrealistic – at least when framed by Nanay's (2024a) concerns. We may be able to restore virtually the Richmond Caligula's missing parts based on comparison with

other extant Roman statues of emperors from the 1st century CE. Similarly, we may retrieve its original colour thanks to chemical analysis of its surface. But Nanay (2024a) casts a shadow over the prospects of these restorative measures' helping us see the statue in the same light as it was experienced in its original historical circumstances. The consequences are arguably even more pronounced in the case of the *Assassin's Creed* video games. There, the ambition was to let us immerse ourselves in the surrounding environment of the remote objects and experience them as if we were transported in time. From Nanay's perspective, these DVCs may certainly stimulate our curiosity and motivate us to learn about antiquity, but they can hardly live up to their status as remote objects mediating past experiences.

Interestingly, we find reasons to be more optimistic about the prospects of AHE in a paper by the same author from the same year. Dealing specifically with pictures from remote cultures, Nanay (2024b) claims that there is a set of features that are relevant to aesthetically experiencing pictures and that all pictures – understood as 'two-dimensional depictions of three-dimensional scenes' – possess (pp. 384–385). This set captures how a 3D scene is depicted on a 2D surface. Nanay claims that all pictures across all cultures can be characterized based on the degree to which their depicted objects are organized with respect to their 'outline shape on the picture surface' ('surface-first pictorial organization') or with respect to 'their position in the depicted scene' ('scene-first pictorial organization'; p. 386). In the former case, pictures' organization is dictated by whatever design priorities the picture maker has or follows, in the latter case, the picture maker aims at capturing the scene's appearance at a given moment. If one or the other dominates, one can infer that this tracks what one is supposed to attend to in pictorial perception (p. 387).

The fact that one can do such an analysis suggests that identifying the features is largely immune to cognitive permeation or one's perceptual learning.

Although discussing pictorial organization of 2D pictures specifically, Nanay (2024b) can be used to back an optimistic perspective on the ambition of using DVCs as remote objects and epistemic images. If he is right that his point about the universal retrievability of certain formal features can be generalized beyond the surface-first/scene-first distinction (p. 384), then restoration, virtual or not, of the appearance of a remote artefact should start from identifying these universally detectable formal features. These would in turn provide access to what was meant to be seen or attended to. For example, experiencing the polychromy of the Richmond Caligula would mediate an intended mode of attention to the painted parts of the statue and being surrounded by the 3-channel video of Xiangtangshan cave could communicate a sense of the cave's spatial organization and its original design, even if only in more general, rough-grained terms.

The point of discussing Nanay's two papers is not to show that he is inconsistent, but rather to demonstrate that the nature of the commitment to AHE depends on what sort of 'experience' remote objects are supposed to mediate. Nanay (2024a) develops an argument that ultimately undermines a strong version of AHE that would see remote objects as conduits to recreating or re-enacting historical experience in its aesthetic, symbolic, and emotional fine-grainedness. Nanay (2024b), on the other hand, embraces a more moderate AHE according to which one can identify, via perceptual experience, formal sets that are universally relevant to how objects manifesting them are experienced or

attended to. This moderate AHE operates with a more coarse-grained notion of experience that is akin to a general mode of attending.

IV. Testing DVCs

The vision-historicist stricture warns that both producing and observing remote objects may be influenced by contemporary notions about certain visual or spatial effects that do not match the historical sentiments. But, as the discussion of the Olmec heads example and of Nanay (2024a, b) demonstrates, the stricture carries a different weight depending on both what kind of experience is to be mediated and how remote in terms of culture and time the object in question is. The stricture provides a corrective to the degree of epistemic trust one has in one's experience as a source of insight into the past. One may take one's perceptual experience of a remote object more or less at its face value and treat it as a reliable or privileged source of evidence of the nature of past experiences or one may be more cautious and treat it as at best merely suggestive of one possible way of responding to the object and in need of further corroboration. Pasztory (2005) presents the portrait-like feel of Olmec heads as their manifest observable aspects, suggesting relatively little doubt as to the reliability of that perceptually sourced evidence. But her confidence does not survive the application of the corrective. What makes her appreciation of the feeling of intimacy radiating from the Olmec heads vulnerable to Baudez's (2012) criticisms is the combination of the radical remoteness of Olmec culture and the relatively fine-grained nature of the experiences they were supposed to elicit.

The following sketch of a graph offers a representation of possible AHE positions as defined by the two variables, that is, nature of experience and remoteness (fig. 1). The

horizontal axis represents a continuum between familiar and radically remote objects and the vertical axis represents a continuum between extremely fine-grained and extremely coarse-grained experiences. The orange curve cordons off a danger zone from the perspective of vision historicism: everything north and east of it is an area of unjustifiably optimistic AHE. Arguably, claims such as Pasztory's will find themselves plotted on the wrong side of it.
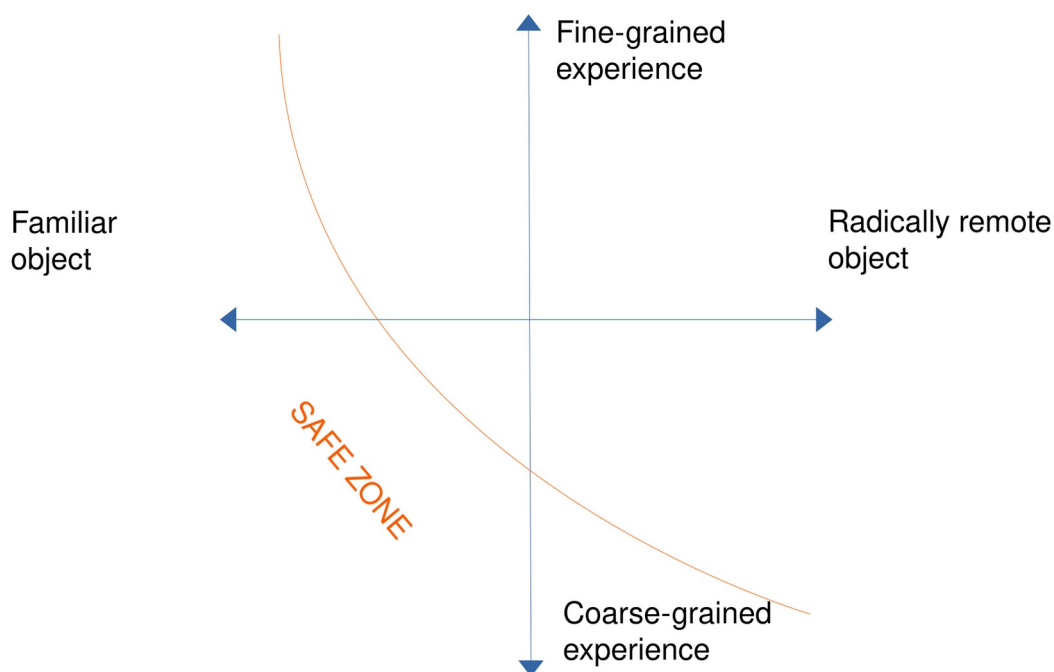

Fig. 1

One of the upshots of AHE is the claim that mediating past experiences can be better served by objects other than the historical artefacts that occasioned the experiences (such as the DVCs). The former can mediate the experiences better than remote artefacts when they present the artefacts' epistemic images – models that better communicate their historical appearance or that help us get a better grasp on what it must have felt like to

experience or interact with them. I want to suggest that the vision-historicist stricture or corrective provides a general direction for testing the soundness of using DVCs as remote objects. With this in mind, let us consider some test cases to assess how DVCs have been employed in pursuit of experiential knowledge. Namely, I will discuss one example that would arguably find itself in the graph's 'danger zone' and two examples that occupy the safe zone to demonstrate that endorsing AHE does not always amount to running afoul of vision historicism.

The digital restoration or re-creation of the Richmond Caligula is not meant to just repair material damage, but also to return to the statue its 'expressive' features (Frischer, 2020, p. 15). Abbe (2020) provides an account of these features in the standard fashion of classical connoisseurship: its posture is 'mannered, yet dynamic'; its head's pose 'self-composed [combining] restrained engagement and noble distance'; the statue imparts 'the impression of an immediate, vital presence', the polish of the exposed skin areas, treated with 'possibly semi-translucent colouration … gave the impression of a "true", seemingly living, virtual likeness' (p. 26). Vision historicism advises that such first-order assessments as Abbe's, reliant as they are on the connoisseur's aesthetic sensibilities, should be checked by higher-order doubts about their reliability. These doubts stem from the apparent evidence that value-laden, perception-based (e.g., aesthetic) judgements are subject to cultural influences and changing fashions: how things appear to or strike subjects sharing one cultural background may differ substantially from how they figure in the experience of another culture.[14] The doubts carry over to the potential of the Caligula DVCs to mediate

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[14]For recent discussions of inter-cultural aesthetic diversity, see Lopes et al., 2024; for the bearing of higher-order evidence on aesthetic judgements, see Whiting, 2023.

reliably the expressive features, since their role as epistemic images is to translate to visual terms beliefs about remote experiences they occasioned.

In one of the earliest examples of exploiting digital visualization in art history, Antonio Criminisi, Martin Kemp, and Andrew Zisserman (2002) reconstruct in 3D the pictorial space of Raphael's *School of Athens* (1511) and Masaccio's *Trinity* (1428). Their aim is to demonstrate the frescoes' perspectival ambiguities and inconsistencies that suggest both painters may have been aware of them (given how meticulous their approach to perspective was otherwise) but disregarded them in favour of the 'subjective' effects they wanted to achieve. The effects the authors talk about – making Aristotle and Plato appear standing below a dome (Raphael) and making vault coffers appear square (Masaccio) – are best described as the result of viewers' navigating the paintings' figurative or pictorial space. Thus, for example, the DVCs of *Trinity* aim to provide a virtual 3D model of the depicted chapel's space following the cues the fresco's linear perspective provides. It turns out these cues are ambiguous as to whether the chapel's ground plan is square or rectangular. The authors claim Masaccio must have been aware of this, but did not feel compelled to resolve the ambiguity, preoccupied as he was with the fresco's experiential impact.

Are the DVCs of *Trinity* its remote objects? Do they deliver epistemic images of the fresco that mediate what it must have felt like to experience or interact with it? On the face of it, this seems far from self-evident. The stated aim of Criminisi et al. is 'to learn about artists' perspectival skills' (2002, p. 1) and not to mediate past modes of experience. Furthermore, one could argue, with justification, that the fresco's more obvious remote object is the

remote artefact (i.e., the fresco) itself; after all, it has been restored twice in the last fifty years, presumably to retain, or recover, its original appearance as much as possible (an ambition attested to by the controversy the more recent restoration stirred; Beck 2002). Yet I want to claim that the *Trinity* DVCs also serve as remote objects, if in a less straightforward way.

To recall, AHE amounts to the view that remote objects can guide our understanding of past experiences of, or responses to, their respective remote artefacts. This is made possible by remote objects' restoring of replicating at least some of the artefacts' perceptual features that figured in those past encounters. As I have insisted, however, the function of remote objects as epistemic images is not exhausted by their restoring the original looks of remote artefacts. So, while the digital models in question are not *stricto sensu* restorations of Masaccio's *Trinity*, they use its perceptual features to re-create its pictorial space in 3D in order to visualize for us the decisions facing the artist in designing the painting's depicted scene and thus help us better understand why the painting looks the way it does. Criminisi et al. (2002) effectively reverse-engineer *Trinity*'s interior architecture to reconstruct how Masaccio might have envisioned the depicted chapel's spatial order and what choices and trade-offs he must have made in bringing that vision to reality. Their *Trinity* DVCs are epistemic images of the fresco in the sense that by transposing the fresco's perceivable features to virtual three-dimensional register they allow us to learn how Masaccio conceived of the task and how he must have attended to its composition. It is thus Masaccio's experience of the painting that is being mediated by the *Trinity* DVCs.

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What remains is to determine the nature and extent of Criminisi et al.'s AHE by identifying the two variables outlined in the previous section: (1) degree of remoteness; (2) nature of mediated experience.

Criminisi et al.'s work is predicated on the plausible assumption that contemporary observers have little trouble orienting themselves in pictures that organize their figurative content along the principles of linear perspective and that they thus observe the spatial organization of these depicted scenes in roughly the same way Renaissance painters would. And since the aim of their DVCs is to communicate the spatial organization of depicted scenes, Criminisi et al. are counting on our familiarity with perspectival images to visualize the challenges Raphael and Masaccio faced. The historical experience they want the DVCs to mediate is arguably a fairly coarse-grained mode of attending to perspectival scene configuration. Given our familiarity with perspectival pictures and the nature of the mediated attitude, it is not surprising that Criminisi et al. treat the experiences the DVCs provide as reliable sources of insight into the historical mode of attending. Their AHE will situate them somewhere in the third quadrant of the graph (fig. 2), that is, in the relative safe zone from the perspective of the vision historicist.
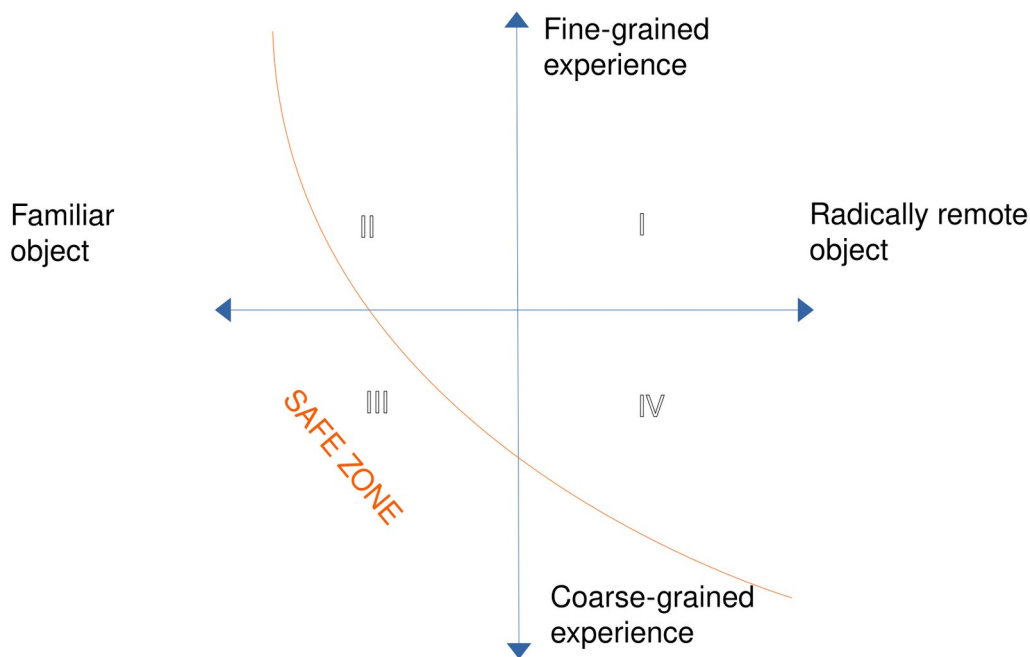
Fig. 2.

A more recent example of using DVCs as epistemic images in art-historical scholarship is Trever's (2022) reconstruction of Niche 14 at Huaca Facho. 'Huacas' refer to the ruins of monumental structures of the Moche culture that thrived on the Pacific coast of present-day Peru during the first millennium (2nd to 9th century CE). Today, we have only archaeological knowledge of this pre-Inca civilization. At Huaca Facho, a wall containing twenty square niches was discovered in the 1950s dating to the 9th century. Each niche contained on its back wall (app. 28 cm²) a polychrome painting of a fantastic creature and scratched graffiti on the inner side walls, some imitating the paintings.

Interested in what she calls 'archaeo-iconology', that is, 'the study of image perception, meaning making, and response as witnessed by the physical traces of past image encounters' (p. 160), Trever conducts a spatial analysis 'to understand how [the monument's] design suggested ideal forms of behavior and comportment and to imagine

how it might have been experienced' (p. 178). In keeping with this mission, she provides a DVC of one of the niches to reconstruct it in its original colour and surface design, but also to provide a sense of spatial narrowness one must have experienced by bending one's upper body to fit it inside the niche. Trever is careful enough always to frame her assessments of the remote experiences in general and tentative terms, never inferring any specific meanings or emotions from the Moche murals. Confronted with these extremely remote artefacts, she makes do with a fairly coarse-grained understanding of experience to be mediated. Her AHE thus can be plotted in the lower parts of the graph's fourth quadrant, still in the vision historicist's relative safe zone.

V. Conclusion

The main argument of this paper is that DVCs used as means of learning about history should be understood as tools of AHE. From this argument, two things follow. On the one hand, in their capacity as remote objects or epistemic images, DVCs often have a stronger claim to being sources of knowledge than the historical artefacts themselves. On the other hand, as any tool of AHE, their use is subject to the vision-historicist stricture or corrective. I have identified a general strategy of securing or testing the soundness of DVCs' use that could be simplified as follows: The more remote the object, the more coarse-grained the experience that is to be mediated.

One could argue, with some justification, that similar conclusions could be made about other AHE methods or other kinds of remote objects, such as invasive restorations or casts. It would, then, not be clear what is really new or groundbreaking about the DVCs. Indeed, AHE itself has a long history. We can find it already in proclamations like the

following by the antiquarian Anne Claude de Caylus, printed in 1752: 'One is not better

able to distinguish the taste of [the ancients], their customs, their turn of mind [...] in the

books that they have left us, than in the works of painting and sculpture that have survived

until our time' (quoted in Potts, 1994, p. 78). Here, the idea is that ancient artworks'

appearances can serve as repositories of contemporaneous experiences that can in turn

lead to broader insights about the ancients' value systems (see also Haskell, 1995).

Equally old are the techniques of producing remote objects, whether it be direct restorative

interventions, plaster casts, or imaginative recreations, such as Giovanni Battista Piranesi's

eighteenth-century speculative 'restorations' of Roman antiquities that involved combining

disparate fragments (not all necessarily of ancient origin) to 'bring back a hypothetical

original stylistic coherence' (van Eck, 2023, p. 91). In this light, DVCs may plausibly be

regarded as adding just another chapter to the history of technological innovation that

expands the toolkit of the art-historical empiricist in their pursuit of mediating remote

experiences.

And finally, at least since Riegl's (1982 [1903]) analysis, we have had the means to

differentiate between recreating remote objects as sources of experiential knowledge and

preserving remote artefacts.[15] Riegl was also already very clear about the potential tension

between the two: an ancient monument's full restoration to its original state would violate

its authentic status of an historic relic. The tension he identifies is that between the goals of

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[15]For Riegl, the difference came down to that between cultural heritage artefacts' value as

    historical documents of past modes of *Kunstwollen* and their value as testimonies to the

    passage of time (as manifested by their patina or dilapidation).

a properly historical scholarship and a modern appreciation of ruins. Riegl suggests that to satisfy both tendencies, 'the symptoms of decay […] must be thoroughly removed', but 'this must be done not to the monument itself, but only to a copy or a mental reconstruction of it' (p. 34).

The simple response to the possible objection that the arguments presented so far fail to show what is really new or different about DVCs as opposed to other AHE tools is that it misses the point. For my aim all along was to show that the DVCs used as means of learning about history indeed are tools of AHE and that their use in museums and scholarship should be viewed as continuing its historical mission. That being said, there is an argument to be made that DVCs represent more than just a new technique of producing remote objects. In Riegl's time, creating remote objects of cultural heritage was possible with drawing, plaster casts, or photography (comp. Riegl, 1982 [1903], pp. 37–38). The advances in 3D modelling, scanning, and printing as well as in the technology used for presenting DVCs lead to an unprecedented situation where the practical implications of uncoupling remote objects from remote artefacts – that is, the uncoupling of the former's role of mediating past experiences from appreciating the latter for their genuineness or authenticity – can dramatically change the curating and study of cultural heritage. If the aim of producing remote objects is to translate into perceptual terms beliefs about the objects' appearances or effects on past audiences, then DVCs significantly untie the hands of scholars and contemporary museum professionals. What is now possible is not just reversible speculation about the plausible original appearance of extant remote artefacts, but also greater interaction with remote objects and their manipulation (for example, to convey a sense of spatial organization, as with the Xiangtangshan digital cave),

visualization of construction stages (Cohen, 2022), or even production of models of remote artefacts that might or must have existed, but have not survived.[16] And last but not least, the practical implications of using DVCs to mediate historical experience also help bring AHE in a new light and understand it better in both its limitations and potential.

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[16]For an interesting experiment in this direction, see Davis, 2024. Fully exploring the last option goes beyond the scope of the present paper, but it would require addressing, for example, the nature of these speculative remote artefacts as images or the potential of using large data sets and generative AI in their production. I thank Whitney Davis for discussing this point with me.

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