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## ARTICLE

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# Frameless scans: on unimages circa 1753 and 2024

**Paolo Patelli**

Aarhus University

**Jussi Parikka**

Aarhus University. Academy of Performing Arts in Prague

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**Abstract**

Between 1750-1753, Giambattista Tiepolo painted the world's largest continuous ceiling fresco in Würzburg, Franconia, commissioned by Karl Phillip von Greiffenklau. This monumental artwork, spanning 600 square meters, depicts Apollo and the Four Continents. Paolo Patelli's film project, *The Countable Parts of the World*, uses a 3D digital model of the fresco to explore historical and media contexts, presenting both as "unimages". The film project shifts focus from visual to data representations, transforming the fresco's organized composition into a dynamic globe, revealing new perspectives and distortions through data manipulation.

**Keywords**

fresco; scan; point cloud model; unimages

*Escaneos sin marco: sobre unimágenes alrededor de 1753 y 2024***Resumen**

Entre 1750 y 1753, Giambattista Tiepolo pintó el fresco de techo continuo más grande del mundo en Würzburg, Francia, encargado por Karl Phillip von Greiffenklau. Esta obra de arte monumental, que abarca 600 metros cuadrados, representa a Apolo y los Cuatro Continentes. El proyecto cinematográfico de Paolo Patelli, *The Countable Parts of the World*, utiliza un modelo digital en 3D del fresco para explorar contextos históricos y de medios, presentándolos como «unimages». El proyecto filmico cambia el enfoque de representaciones visuales a representaciones de datos, transformando la composición organizada del fresco en un globo dinámico, revelando nuevas perspectivas y distorsiones a través de la manipulación de datos.

**Palabras clave**

fresco; escaneado; modelo de nube de puntos; unimages

**Introduction**

In 1750-1753, Giambattista Tiepolo, one of the most celebrated Venetian painters of the 18th century, painted the world's largest fresco on a continuous ceiling in Würzburg, Franconia. Commissioned by Karl Phillip von Greiffenklau, this monumental artwork adorns the vault over the grand staircase of a vast compound built by local prince-bishops between 1720 and 1744. The fresco, spanning 600 square meters (18m x 32m), elaborates on the theme of Apollo and the Four Continents,<sup>1</sup> depicting the known world in Europe during the mid-18th century. Its grand scale and placement require viewers to experience it in motion, revealing and concealing parts in an interplay with the architectural surfaces (Figure 1).



Figure 1. Tiepolo's fresco as seen from the first ramp of the Würzburg Residenz's monumental staircase. Source: Paolo Patelli



Figure 2. Pulsed laser scanner Riegl VZ-400, part of the multimodal real-time scanning unit Irma3D, on the Würzburg Residenz's monumental staircase. Source: Paolo Patelli

This article examines the fresco within a variantological context through the process of Paolo Patelli's experimental film project *The Countable Parts of the World*, which uses a digital point cloud model of the fresco derived from a 3D scan of the architectural space to explore resonances and differences across traditional periodization and image cultures.

Both Tiepolo's fresco and contemporary digital modelling as deployed in the film project are presented as instances of "unimages".<sup>2</sup> The concept defines objects existing not only at the threshold of visibility, but simultaneously inhabiting a different register than visibility, acting rather as models for what can be known through the processes of their creation. These instances exemplify how specific capture and

1. Tiepolo's fresco is often referred to as the Four Continents, but the term "Four Parts of the World" is also commonly used.

2. The unimage refers to Peter Geimer's (2018) take on the photographic discourse as well as Jussi Parikka's (2023) mobilization of the term in relation to the operational functions of imaging and sensing.

visualization apparatuses challenge and redefine our understanding of images. Tiepolo's fresco represents an illusory triumph, a scene that is purely about appearance and simulation. However, this is destabilized by intricate details—a “controcanto”—that reveal deeper layers of reality, a “measuring magic”, exposing the underlying fabric of the world (Calasso 2006, 38-39). Meanwhile, the visibility of the fresco within the staircase of the Residenz is inherently linked to its spatial configuration and architectural presentation. The way it is experienced is shaped by the physical space it occupies, influencing how viewers perceive and interact with it.

The digital model of the fresco is instead defined by software formats, data, and mathematical functions—elements that are inherently invisible. These models are not meant to be seen in their raw form but are instead processed to produce visual representations. The digital model operates in a tension between visibility and invisibility. While the end product may be visual, the underlying processes and data structures remain unseen. This dichotomy highlights the generative potential of digital modeling, where reality is continuously reconfigured through unseen mechanisms – doubling here the idea of painting as sorcery, enabling the world to start anew each time, through the rituals and sacrifices depicted.

Both the fresco and the digital model prompt a reconsideration of the image's status, as the interplay between visibility, transparency and invisibility in both mediums generates endless reconfigurations of reality. This ongoing redefinition is crucial in understanding contemporary sensing methods, which increasingly construct and interpret the world as an image, while also relying on invisible—or invisual—data and processes.

The term *world-picture* in this article refers to modernity's fundamental event: “the conquest of the world as picture”, the inscription of the historical colonial context into colour, architecture and representation in the 1750s. The *data-picture*, on the other hand, is the model that mirrors the world-picture as a datafied counterpart, reproducing its spectacle as a three-dimensional structure, comprising data points with associated vectors in RGB colour space and unique depth values, determined by an active scanner using laser light to probe the space. The scan methodology links these (un)images across their histories.

In the fresco, Würzburg and its rulers are positioned at the center of the cosmos, as the New World unfolds within the Old. A zodiac ecliptic band scans the volume of space, with Apollo at the degree of Karl Philip von Greiffenklau's natal Sun: a good omen but a total mystification (Calasso 2006, 38). In the film project, it is the 3D scanner that defines its own point of origin, as it reorganizes the composition into a dynamic globe. The model shifts the focus from the visual to a case where the notion of “image” becomes inadequate. Initially tied to a spatial format where architectural surfaces and volumes shape perception over time, the image, once digitized, is determined by the scanning process's possibilities and constraints, which makes it available for further operations.

The film project explores the transformation of the fresco's frameless image into an immersive expression of mobility. Through data manipulation, a variantology of imagery and visualization emerges, subjecting the

world-picture to dynamic variations and alternative projections afforded by the data-picture. This deformation reveals existing and new distortions, offering a new perspective on both the fresco's and the model's cultural significance.

## 1. Images as unimages

Peter Geimer's suggestion to pay attention to the sites where an image becomes *not* an image is helpful as we focus on pictures that are simultaneously seen and not seen, visual and computational. The concept of unimage describes images at the threshold of their disappearance, when their medium's materiality becomes visible instead. For Geimer, the genealogy of unimages includes photographs that have vanished or eroded, that are defective and glitched. The term can help reflect on the material effects of the composite data-picture. In dealing with unimages, the invisual becomes an epistemic and aesthetic object of manipulation, and images acquire the functions of experimental systems and models: they measure, diagram and project – they explicit the operations that composed them.

Mischievous details of the fresco resonate with the holes in the perceived continuity of the model, from which the fresco and the architecture of the hall have disappeared. When a piece of the pictorial surface enveloping the staircase is missing, a part of the model is inaccessible, but its structure and scanning technique are revealed. The occluded parts that at any moment become inaccessible up and down the staircase are reflected in the gaps present in the point cloud. Once the transparency of the scan is disrupted, it becomes readable. The beholder no longer merely sees the content of the picture, but also the (remediated) materials in which it manifests itself. The tensions come to the surface.

The pictures generated by technical implements are so enmeshed in the processes of their production that the contemplation of the resulting image cannot be separated from how it came into being: “The material, as well as the process, becomes obtrusive” (Geimer 2018, 8). Tiepolo, on his part, chose to depict the wooden platforms on which he and his assistants stood while painting the ceiling. The *trompe l'oeil* scaffold and its plunging perspective enhanced the illusionistic space and emphasized the idea that Europe is based on the empirical coordinates of a distinctly contemporary time and place (Weintraub 2016, 673).

Tiepolo devised his fresco to be viewed as the beholder moved. He arranged it to take into account the changing perspective of the visitors as they climbed the grand staircase toward Europe's composition. The different viewing points for observing the fresco follow the procession up the staircase and reveal themselves in multiple stages. As visitors climbed the first set of stairs, they would see Tiepolo's America fresco in front of them, with portions of Asia and Africa gradually coming into view on the walls to the left and right. When they reached the midway landing, they turned and continued up one of the two narrower side flights in two stages, reaching a balustraded gallery and eventually



getting a full view of Europe near the end of the journey. The experience was dynamic, with visitors unable to see the entirety of Tiepolo's ceiling all at once, but instead getting carefully contrived views of the four continents as they ascended the Treppenhaus stairs.

In the Asia, Africa and America sections, the fresco features vague and ambiguous forms. Many of the figures in these first three walls of the Treppenhaus appear incomplete and indistinct. Tiepolo consistently renders human figures in such a way that they lack clarity and coherence, creating fragmented and disjointed forms that do not serve the conventional purpose of the fresco's narrative. This is evidenced, for example, by the unresolved forms surrounding the figure of Asia seated on her elephant.

These figures, located to the right of the elephant that Asia is sitting on, have their heads hidden by their own bodies and their clothing hides any details of their anatomy. Tiepolo used similar colours for the figures and the hillside behind them, making it difficult to distinguish them from their surroundings. The viewer is left to use their imagination to interpret these ambiguous forms, at once advancing and receding into the background as identifiable bodies or shapeless extensions of the landscape (Weintraub 2016).

This generative ambiguity produces "potential images" whose legibility is not manifest but "lingers in a certain latency" (Geimer 2018, 68). The point of the interpretation of potential images is, in fact, not the "correct" identification but the "imaginative side of perception" (Gamboni 2004, 16).

Not interested in subjecting himself to the totality of appearance, Tiepolo carved out with invisible shears kindred and secretly responsive possibilities (Calasso 2006). The visual signs continually recoding themselves stretch the moment of recognition and comprehension, with no clear resolution.

## 2. The whole and the parts

The fresco, in the combination of its parts and the implied relations and hierarchies, articulates a conjectural cosmography, or a cosmogram, in the sense that the historian of science John Tresch gives to the term. Cosmograms can be "object-maps, diagrams, buildings, calendars" (Tresch 2014, 163), all things this fresco combines into a dynamic composition. Far from neutral depictions, they are "performative assertions" which, in the case of this fresco, translate as colonial claims, bringing symbolic and material worlds to a particular spatial arrangement within the European continent. Its vision is of unity, but the entities it assembles are distorted and fragmented. The image of totality can only hold within the local as in a one-point perspective – or a single time-of-flight 3D laser scan – allowing missing information, holes and gaps to exist in a coherent image behind occlusions. As Giorgio Manganelli wrote, "Tiepolo is not only a liar, he is a forger, the inventor of a coherent and uninhabitable, seductive and unattainable world" (Manganelli 1971, 36).

The fresco, painted quickly into wet plaster intonaco above the room's architectural cornice, portrays elaborate figural groupings representing each of the four continents, personified as brown-skinned America riding a crocodile, black-skinned Africa riding a camel, turbaned Asia on an elephant and enthroned Europe who looks up to a floating portrait of Tiepolo's patron von Greiffenclau, against a backdrop of a god-filled sky that symbolizes the planets. The four continents are an endless bazaar: in America, they cook meat, perhaps human, skewered on a spit. On the ground, off to the side, lie severed heads. All around unfolds a cosmopolitan parade, a phantasmagoria of history.

Rituals and sacrifices enable the world to start anew each time by reintegrating all necessary forces and principles—visible or invisible—in an endless reconstruction of reality.

The fresco presents symbols, representations, and themes that have long marked the European imagination (Shirley 2008), at least since Ortelius' *Theatrum Orbis Terrarum* (1570), the first modern atlas. From the 16th century on, allegories of the four continents took their place beside those of the four seasons and the four elements, and they displaced the four winds from the corners of the ornate compasses and maps. Soon, the title pages of books on new geographical discoveries became their domain, too, where they brought their universal homage to God and kings (Mason 1998; Lowe 2015). A cliché in Baroque iconography, personified representations of the four continents might be found throughout the Residenz in sculptures, tapestries, stuccowork and other decorative elements.

The four parts of the world were often represented according to recurring stylistic features, defined in Cesare Ripa's *Iconologia* ([1603], 2012). Iconology relies on an elementary but highly effective structure, a litany of peculiar taxonomies and pure alphabetical ordering to describe abstract concepts. It organizes knowledge through allegories, structures and compositions of figures, features and objects. Intimately linked to power, it enforces orders and preserves the memory of past orders.

Tiepolo never traveled outside of Europe, and for the composition of the scene, besides the usual treatises on iconology, he relied on imagery sourced from travel diaries and explorers' tales, published works blending autobiographic writings with colonial anthropology and political propaganda into spurious accounts of a plundered, discontinuous world.

Even if Tiepolo does not show an interest in ethnographic accuracy, itineraries with common themes allow us to identify the sources of information about objects, activities and animals (Ashton 1978), within the colonial capture project. One such source is Hans Staden's *Warhaftige Historia*, a personal chronicle and a highly propagandistic piece that detailed the experience of a Protestant Hessian as a captive to the Tupinambá in Brazil in the 1550s. The text, produced by Staden to confirm his own identity upon his return to his homeland, serves as a gateway into the minds of Europeans in Brazil during this time (Whitehead & Harbsmeier 2008). The woodcuts – much like Ripa's system – encode cultural references, natural phenomena, indications of cosmological

and celestial presences through stars, suns, moons, winds, clouds and rain, or affiliation through the presence and positioning of hair, skulls, parrots, cormorants and birds, and technical development with canoes, houses, palisades, pots, bows, arrows and clothing. Staden's work was later reproduced by Theodor de Bry in Frankfurt. His project, resembling a cabinet of curiosity, organized information using text and images to offer encyclopedic knowledge about the Americas. The numerous prints – in ways comparable to the fresco's – enabled readers to take possession of these distant lands and peoples, allowing them to participate in the colonial projects underway at the time. This gave them a sense of dominance over the peoples and lands across the Atlantic, which many in Europe would never see in person.

The fresco represents a peculiar kind of enlightenment: knowledge aspires to be encyclopedic, but it is organized as the scale model (1.25:1) of an all-embracing vertical stage, a fragmented and unstable play. It is a (un)image of the world that tries to capture its infinite variety within a local cosmology, an unavoidable failure to reconcile the self with the universe.

Tiepolo's formal and compositional indeterminacy, a recurrent ambiguity in giving form to bodies and landscapes, and his use of the *non finito* in figures intendedly left unfinished require the observer to "fill in" information and introduce elements of disorder into these structures (Weintraub 2016). Such tension unsettles the established archive of visual knowledge, introducing operations of the anarchive instead (Zielinski 2015).

### 3. Calculated immersion

The fresco is puzzling even to art historians as it is not a picture in any traditional sense: as noted by Svetlana Alpers and Michael Baxandall (1994, 1), "[i]t has no frame, cannot be seen as a whole, lacks a narrative center, and to see it one cannot stand still but must be on the move - climbing towards now this part then that, before arriving at a platform on which one walks both beneath and across from extended friezes of figures." Instead of a picture grasped at once, it unfolds as a moving image experience, where the spectator is invited to move along multiple dimensions and trajectories enmeshed into the space and the architecture. The fresco transforms the staircase into a machine for viewing (and concealing) by enveloping its inherent lines of movement. The assumptions, the revelations, and the overall vision are spectacular elements of extraordinary directorial virtuosity: "uplifting and unsettling 'special effects'" (Manganelli 1971, 39). There is no central focus: the architecture builds up the cinematic experience of movement and surfaces, and the fresco multiplies it: "If the sky is as big as the ceiling, and as close, it will act as a vertical stage" (Manganelli 1971, 37). Spatial and temporal articulations reveal and disrupt plot points at every step. Elliptical and unresolved, the view changes as the viewer mounts the staircase, as light changes from hour to hour and season to season:

"As one moves through it one sees this part of Tiepolo's painting, but not that, or this part close, or far, or at an acute angle, emphasized or eliminated by some lighting effect." (Alpers & Baxandall 1994, 115).

The fresco emerges at a historical threshold between image practices, where the spectacle of the colonial "new" is mediated through cosmographies, reinscribed as maps, and allegories, but also new media like the aptly named "mondo nuovo," or "new world". An optical device popular in 18th-century Venice also known, more popularly, as "peep-show box", the *mondo nuovo* was a portable apparatus shaped like a box, with small portholes through which the viewer could enjoy illuminated landscapes and scenes for a token (Riva 2022). If Tiepolo's expansive sky, encircled in a 360-degree view by the allegorical continents, might resemble a blown-up "mondo nuovo," following Manganelli (1971), for Tiepolo, the sky is a pantograph of the ceiling. The fresco, however, is also comparable to a celestial cartographic projection that integrates the celestial sphere and part of the Earth's surface into a much-distorted representation of the world. If map projections provide mathematical solutions to the process of flattening a sphere to a plane, the fresco exposes an impossible problem through an optical stratagem, a visual distortion more than an accurate plotting of points or measuring of areas and distances. As an ultrawide hemispherical view from the ground looking up, the composition anticipates hemispherical lenses, used, for example, in meteorology to study cloud formation in the 1920s, mounted on *whole-sky* cameras.

Today, many planetariums use fisheye projection lenses to display the night sky and digital content on the interior of a dome. In computer graphics, circular fisheye images can be used to create environment maps from the physical world. These environment maps are useful for rendering 3D objects and virtual panoramic scenes. The cases are different scalings of models constituted and mediated by images, the result of what the personification of Painting, next to Europa, is intent on doing: summoning a globe, with briefcases in one hand, as the intruding European: curious, discordant, "an outpost of the one who looks on while a subtle derision brushes against him" (Calasso 2006, 222).

### 4. Scanning space

Techniques of representation of space in Western visual cultures have to a significant extent developed from mathematical reconstructions of the three-dimensional world, systems of linear perspective and Euclidean/Cartesian models of space. Three-dimensional computer-generated imagery has its roots in such image-making systems and early forms of calculated visualization, as Reinhold Martin (2017) argues, pointing to Albrecht Dürer's 1525 illustration of a one-point perspective as the description of the movement from the analog world of objects to the discrete coordinate space of images. In a similar tone, Kittler (2010, 62) refers to Alberti's "greatest innovation" as a form of scanning that operationalizes the world through its addressification into a gridded image.

The innately mathematical scaffolding of a linear perspective, “which pixelated the world before the raster screen” (Parikka 2012, 71; Kittler 2010, 54-62), cannot, however, contain the hallucinatory aspects of visual media and kinaesthetic sensation (Kittler 2010, 78). In a fresco, the deeper the perspective, the more sensitive the illusion is to where the viewer stands. When the solidity of a settled perspective is abandoned, when the place of the viewer in relation to the scene is not asserted so insistently, Tiepolo takes advantage of the way ambiguous horizon lines and vanishing points allow the eye’s interpretation of a view to change, as it moves about in front of it or below it.

Alpers and Baxandall show how the science of perception is powerfully present in Tiepolo’s technique, from his “sense of the shifting physical structure of the photon flux” (Alpers & Baxandall 1994, 90) to the mechanisms of edge-recognition. “Much of the idiosyncrasy of Tiepolo’s painting,” they write, “results from his registering the activity of the mind as it grasps the world ... It is as though his extended inventive procedures – the multiplication of pen-and-wash drawings, sketches in oil, vast frescoed surfaces – are a perpetual rehearsal of the mind’s construction of the world.” (Alpers & Baxandall 1994, 46).

For the in-progress project *The Countable Parts of the World*, the high-resolution point-cloud and photogrammetric three-dimensional model of Tiepolo’s fresco was realized in collaboration with Prof. Dorit Borrmann (Technical University of Applied Sciences Würzburg-Schweinfurt) and the Department of Robotik und Telematik at the Julius-Maximilians-Universität Würzburg. Borrmann’s custom-made robot Irma3D is designed as a multimodal real-time scanning unit, combining laser scanning and 3D point cloud processing with the ability to combine the data with other modalities, such as visual images acquired by photo cameras and temperature sensed through infrared light.

The main sensor on Irma3D is a Riegl VZ-400 pulsed laser scanner. It uses the concept of direct time measurements by sending out a focused beam of light. A receiver waits for the return of the reflected light and measures the time between sending and receiving the light. Multiplied by the speed of light this yields the distance to an obstacle (Borrmann 2018). The laser scanner sweeps its environment spherically: for each point belonging to the sphere, the depth value is calculated. Parts of the scanned surface that are not reachable by the laser lead to discontinuities in the model, and feature detection can help to combine multiple scans to obtain a comprehensive view.

Point cloud data is processed by exploiting either the data’s spatial structure or by simulating the sensing process’s characteristics. The first divides the point cloud into spatially organized sections of binary or octonary trees, cutting space at each internal node. The organized division of worlds becomes a technical feature of creating data models. The Würzburg space was detached from its context with data capture techniques: instead of the human gaze moving across the vast, overwhelming cascade of fresco surfaces, technical sensing was deployed. The resulting scans could technically include nonrepresentational aspects like humidity and heat measurements attached to each point of the cloud and constitute, in this sense, operational images, as they pro-

duce the dated invisibility of an unimage (Parikka 2023) that builds on an existing pictorial surface while troubling its definition.

Moreover, storing a three-dimensional capture of the fresco and its spatial supporting elements as a dataset echoes the claim that, with the digital, we are at the “very threshold of the visible” (Elsaesser 2008, 239). The resulting unimage becomes an integral part of software and data techniques that operationalize the spatial environments of images that came before the digital. If Tiepolo’s pre-cinematic unfolded in relation to the movement and capacities of the viewer’s body, the other pole of this transformation of images into unimages takes place in the interfaces of modeling and animation software. The fresco becomes addressable as data points and then pixels within a two-dimensional coordinate space starting from 0,0 at the top left corner, assuming a unique combination of red, green and blue intensities. There, the RGB colour model works differently than the mix of powdered colours applied on wet plaster; the move from visual culture to digital or “codec” culture relies on a “plethora of protocols for compression and transmission” (Parikka 2012, 36), with their own specific artifacts.

Consider seeing images like a multimodal scan would, as humidity and temperature, as wave and molecular interactions. Consider the sky itself as such an interaction. Physically, the sky is made of tiny molecules, determining the colours sunlight appears with. When the sun is low and light travels through a thicker layer of the atmosphere, the resulting colour is red. That colour illuminates all other things, including the clouds, which are made of bigger water droplets, a few micrometers in size. The droplets, while individually invisible to the human eye, are perceived as a continuum together. They reflect all the sunlight and are, therefore, coloured only if the light coming to them is coloured. In the fresco, the clouds that appear to be convective in origin are the most colourful ones. Normally, the clouds that make red sunsets are clouds and layers that, like overhead mists, act as a ceiling in the sky. When the sun begins to set, it illuminates the clouds orange, red or pink, depending on the weather.

The clouds are mechanically ephemeral compositions. They are mainly convective, exuberantly shaped, dictated by internal turbulent motions. However, there are also stratiform clouds of the much more quiescent overhead fogs that result from the cooling of the atmosphere, such as the air near the ground in northern Italy in the evening, which often generates haze and stratiform clouds at various altitudes. Many of these clouds are depicted with twilight colours that last only a short time and which clouds can capture only for a few minutes.

The sky in the fresco was folded three times; if opened up, it would represent an incoming thunderstorm at sunset. In this dying light, even the strange presence of a disruptive light near America fails to change the overall atmosphere, that of a single twilight that envelops the entire globe. This soft, terminal light is quite different from the saturated blues of the tropics, where the transition between day and night is abrupt. Pink, blue and yellow are then the breath of Europe that starts to become the atmosphere of the entire world, the model of terraforming new worlds in the colonial trope across the planet (Crosby 2019).

The film project *The Countable Parts of the World* aims to add yet another mediation through the scan and digitization of the fresco and its space as a point cloud model. This would present an additional datafied envelope that ties into and detaches from the fresco's spatial characteristics. Tiepolo's cosmography is captured as a point cloud data-picture, not so much a datafication of the world as a datafication of the process of representing the world as a picture. This multiple movement from fresco to scan and scan to video defines our methodological route of thinking through these image/unimage connections across media and space.

While a laser scanner captures the spatial geometry of the staircase as a three-dimensional dataset, photosensitive cells inside a camera record images; depth and visible light exist as bits attached to latitude and longitude coordinates. Such a combined dataset is neither a photograph nor a computer graphic nor a fresco nor architecture. Yet, it reshapes all of them into an unstable form of movement, time and space – a navigable cloud of coloured points, an unimage of sorts.

If a well-established grammar had already been developed for painted domes in the 17th century, a “story code about personal navigation” (Klein 2004, 40), in Würzburg, it is the entire architecture of the Residenz that adheres meticulously to a protocol of ritual design in which every aspect is planned. Within its hallowed halls, every detail is predetermined, down to the number of steps each participant must take. The rules to be followed by each guest are etched into the fabric of a scripted and immersive space, in an atmosphere of precisely structured reverence that culminates on the staircase's landing, where Tiepolo's illusionistic ceiling painting duplicates the architectural perspective. Faithful to the pictorial genre of the quadraturism school, Tiepolo utilizes the architectural elements of the pictorial composition to amplify the environment's internal space, making them part of the overall choreography. The *quadratura*, directly tied to 17th-century perspective theories, effectively unites architecture, painting and sculpture within the scripted sequence of a spatial experience.

This specific illusion, however, is not centered on one focal point: Alpers and Baxandall see the definition of Tiepolo's “pictorial intelligence” precisely in the circulatory movement of fragmentary information. The aerial aesthetics of lightness and mobility are central to the Venetian's project; the *quadratura* supports but cannot contain the complex interplay of a mobile light and a mobile viewer, the fresco's “fluid potentiality” (Hunter 2017). The circulating patterns followed by the beholder add ever-increasing value to this work, to some degree anticipating interactive art environments where immersivity modulates the relation between spectacle and spectatorship. This immersive world is the envelope of a mobile experience that emerges earlier than the common media-technological references of the 19th century, such as the panorama, to then ripple down to cinema and virtual reality (Friedberg 1994).

Tiepolo started painting directly above the main cornice to avoid enclosing the ceiling composition with a stucco-work frame (Helmburger & Staschull 2017). As a result, the Würzburg piece is peculiarly full of

sky for an allegory of the continents: “the sky is a gigantograph of the ceiling, and the terrestrial world aspires to sublimate itself through the ceiling” (Manganelli 1971, 33). This atmospheric motif also works to dissolve edges with their malleable form, sponge-like ability to absorb light, and the opacity that enables them to be strongly reflective while lacking surfaces completely (Alpers & Baxandall 1994).

## Conclusion: undoing and redoing

The fresco, with its sky and continents, envelopes of light, the extensive catalog of figures and objects, its litany of taxonomies, its strict protocols of fruition and the inescapable ambiguities brought in by Tiepolo's use of the *non-finito* and by the interaction with the viewer, makes itself available for variantological experimentation a moving image about movement of images and spectators. As a 360-degree view, it anticipates the geometries of mapping textures and immersion as a spatial experience. The frameless architectural image of the fresco stretches into the framelessness of the scan. They respond to “worlds” differently, but with a correspondent tension between capture, partitioning, movement, light and its datafication. The meaning of the transition between formats lies in the possibility of investigating the depth and layers of the images and their potential histories, their geopolitical cosmographies, through an art-science collaborative work.

Our experimental approach to art via technical media is informed by the notion and practice of variantology, which here also includes a recursive approach both technically and conceptually. In other words, while Zielinski (2011) pays attention to questions of art with or after media, we are interested in developing a case study and a methodology of art through media. The invention of new media between the 1730s and the 1790s in what Zielinski describes as a “rich culture of experimentation” in London, Paris and St. Petersburg, finds a different story in considering this domed staircase in the context of modern technological advancements. This method, to echo Zielinski, is not about “renovating or restoring the world” but about a “never-ending-experiment” that in this mode of testing and trying, recontextualizing and resurfacing aims to discover a zigzag between the 1750s and our current period by way of a recursive move.

Our practice-based inquiry reflects on its conditions of existence: what sort of images (and unimages) do we work with? Relying on the epistemological and illusionistic tools of the 18th century and today, the filmmaking process mirrors the processes of capturing and reproducing images and information. Calculation features in multiple moments, from the steps along the Treppenhaus to the process of datafication. “Inside” a high-resolution point-cloud model of Tiepolo's fresco, the shots, in simulated natural light, will register the variously skewed conditions of viewing the complex of the Treppenhaus vault, to then remap



the data-picture onto alternative projections. As such, it deals with and extends the *entr'acte* of cinema, in this case, circa 1753 and 2024.

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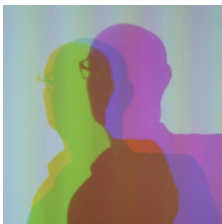


## CV

**Paolo Patelli**

Aarhus University  
patelli@cc.au.dk

Paolo Patelli is a postdoctoral researcher with the Design and Aesthetics for Environmental Data project at Aarhus University. With a background in architecture and an interest in multimodal methods, he previously developed projects investigating the materialities, scenes and atmospheres at the intersections of space and society, technologies and environments as a Research Associate at the Research Center for Material Culture in Leiden (2020-2022). He was a fellow at the Akademie Schloss Solitude (2020-2021), a research fellow at Het Nieuwe Instituut (2019/2020), artist-in-residence at the Jan van Eyck Academie in Maastricht (2017/18). He collaborated with the Programme d'Expérimentation en Arts Politiques (SPEAP) at Sciences Po (2016-2018), and taught at The New School's Parsons Paris, Design Academy Eindhoven (2017-2021) and Sandberg Instituut (2019-2022). He holds a PhD in Architecture and Urban Design from Politecnico di Milano (2015).

**Jussi Parikka**

Aarhus University. Academy of Performing Arts in Prague  
parikka@cc.au.dk

Jussi Parikka is a cultural historian and a theorist who works as a professor of Digital Aesthetics and Culture at Aarhus University. He is also the director of the Digital Aesthetics Research Centre and co-director of the Environmental Media and Aesthetics research program. In addition, Parikka is a visiting professor at the Academy for Performing Arts (Prague) as well as at the University of Southampton. His recent books include *Operational Images* (2023) and the co-authored *Living Surfaces: Images, Plants, and Environments of Media* (2024) and *The Lab Book: Situated Practices in Media Studies* (2022). In 2022 he co-edited the *Words of Weather* book. Parikka has also worked as a curator, including the curatorial teams of Helsinki Biennial 2023 and transmediale 2023, as well as the co-curator of the two exhibitions "Weather Engines" (2022) and "Motores del Clima" (2023-2024). <https://pure.au.dk/portal/en/persons/parikka%40cc.au.dk>

