Routledge
Taylor & Francis Group

Visual Resources

an international journal on images and their uses

ISSN: 0197-3762 (Print) 1477-2809 (Online) Journal homepage: www.tandfonline.com/journals/gvir20

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Tom Milnes, Peter Ainsworth & Sam Plagerson

To cite this article: Tom Milnes, Peter Ainsworth & Sam Plagerson (02 Sep 2026): Returning to the Preserving Machine: Mutations and the Probabilistic Image, Visual Resources, DOI: 10.1080/01973762.2026.2702786

To link to this article: https://doi.org/10.1080/01973762.2026.2702786

Published online: 02 Sep 2026.

Returning to the Preserving Machine: Mutations and the Probabilistic Image

Tom Milnes, Peter Ainsworth and Sam Plagerson

This commentary revisits the article 'The Photogrammetric Image and Black Boxed Mutative Automation' from the shared perspective of The Preserving Machine collective, returning to our original text to examine how its concerns have transformed within the contemporary ecology of computational imaging. Re-engaging with Philip K. Dick's 1953 short story 'The Preserving Machine' as a conceptual hinge, we explore how themes of preservation, mutation, machinic agency and infrastructural opacity resurface across today's imaging systems. Since we wrote our earlier work, photogrammetry's once-visible ruptures and torn surfaces (while still present within contemporary image capture) have shifted into the hidden operations of probabilistic volumetric imaging methods. Techniques such as neural radiance fields (NeRFs) and Gaussian splatting use trained models to interpret sense data in real time. Instability resides within optimisation procedures, weighting schemes and dataset-derived assumptions, shifting the onto-epistemological stakes of the image away from sensory capture as evidence and towards computational inference. Across this landscape, generative synthetic processes including text-to-three-dimensional production methods create images and volumes assembled from statistical residue rather than sense data inputs, embedding the biases, omissions and extractive conditions of their training data. Simultaneously, imaging technologies remain entangled with militarised and surveillance-driven infrastructures that govern sensing, prediction and operational visibility, shaping how images act within systems rather than how they appear to human viewers. Collectively, we argue that these infrastructures demand a continual return to the question of what an image is now, as computational imaging systems mutate beyond

THE PRESERVING MACHINE is a multi-media research collective formed at LCC UAL in 2020, emerging from a shared concern with how new imaging technologies are understood and made legible through the languages of photography. Extending from this initial focus, the collective examines how contemporary computational imaging practices exceed inherited vocabularies drawn from other visual media, art practices and the technical languages of image construction, while continuing to be interpreted through them. Its research-practice spans exhibitions, workshops and collaboratively authored research papers, situating computational imaging within broader cultural, political and onto-epistemological frames.

Visual Resources, 2026
ISSN 0197-3762
https://doi.org/10.1080/01973762.2026.2702786

inherited conceptual frameworks, and ontological assumptions about representation, evidence and agency.

Keywords: Machine Vision; AI Imaging Processes; 3D Computational Imaging; Photogrammetry; NeRFs; Gaussian Splats; Speculative Fiction

This reflection revisits 'The Photogrammetric Image and Black Boxed Mutative Automation',[1] an article developed when each of us was working largely in isolation and attempting, from different positions, to make sense of emerging three-dimensional (3D) imaging technologies. Our early conversations were shaped by interests in the onto-epistemology of the 3D image, the languages related to photography and filmmaking used to understand technologies such as photogrammetry, the technique by which many overlapping photographs of an object or environment are computationally stitched together to reconstruct it as a textured, 3D digital model. The research discussed the imaging technology's affinities with speculative fiction, notably Philip K. Dick's *The Preserving Machine*.[2] In the story, the eccentric scientist Doc Labyrinth invents a machine that transforms musical scores into strange, hybrid living creatures which, as it turns out, are self-sufficient, so that he can preserve classical music against the threat of future catastrophe. However, he soon discovers that his control over these creatures is limited. Once released into the world, they adapt to the conditions of survival and evolve into what he categorises as violent beasts. When one of them is returned to the machine and transformed back into music, Labyrinth finds that the work it was designed to preserve has been transmuted into a distorted and, to him, abhorrent form. This story offered a conceptual lens through which questions of mutation, preservation and automation were first approached.

We argued previously that photogrammetry with its application to cultural heritage sites has become tied up with misconceived understandings that it appears to objectively record the world. Hito Steyerl's *Ripping Reality*[3] served as an exemplar for how we conceived the composite nature of 3D images, particularly in the way that she foregrounded the broken, partially rendered surfaces produced by 3D scanning software, which are frequently overlooked as technical noise. Building on these observations, we also extended Steyerl's imaginative leap that these processes represent a revolt against conventional forms of representation, which she links to 3D images turning against the political and infrastructural conditions of their making. We saw Steyerl's unruly images as a way of thinking through Dick's aberrant creatures and the unstable seams apparent in light detection and ranging (LiDAR) and photogrammetric scanning processes, which we understood as disclosures of infrastructure, ideology and machinic agency.

In returning to that framework, this reflection considers how the concerns of the earlier text resonate within the contemporary ecology of computational 3D imaging and beyond. To mirror the structure of the original, we have organised our response in a similar way: moving from new forms of imaging technology to the current condition of the black box, which in this case pertains to training data and artificial intelligence (AI) processes, and then to the infrastructures through which outputs embody the systems from which they are derived, and what is at stake in this.

More specifically, the four sections that follow trace a single trajectory. We begin with the shift from photogrammetry's surface ruptures to the probabilistic volumetric methods that have come to dominate 3D imaging, including neural radiance fields (NeRFs), Gaussian splatting and LiDAR-derived radiance fields. From there, we follow a new trajectory from sensor-based capture to fully synthetic, AI-generated 3D production. We then turn to the militarised and infrastructural genealogies through which all these techniques have developed. Finally, we return to Dick's story, reading it as a way of thinking about preservation, speculation and the cultural narratives that now scaffold imaginings of technological futurity. Our framing question, 'How has 3D imaging changed over the past five years?', can be read as one focal point within the broader question of what an image is now, taking in debates about computational imaging and AI agency that had not yet taken their current form when we wrote the original text. But throughout, we stay close to the specific terrain of photogrammetric and other forms of computationally mediated practice, and to how Dick's text continues to help us read them.

The technical field of 3D imaging has expanded significantly under the umbrella term we are using, 'probabilistic volumetric images' (PVIs). NeRFs, Gaussian splatting, LiDAR-based volumetric capture and processes that amalgamate or, in Doc Labyrinth's terms, transform,[4] captured sense data with computer-generated simulations now coexist alongside photogrammetry. Together, they redefine what counts as spatial imaging process and shift both the location and character of the mutative instabilities that we associated with raw 3D image outputs. At the same time, generative systems under the umbrella of AI processes, including diffusion-based text-to-image models and the rapidly evolving domain of text-to-3D production methods, have introduced modes of image production no longer anchored in direct translation of sensory capture inputs. These processes reposition the image as a statistical construct assembled from textual, multimodal or algorithmically estimated sources, raising new questions about agency, evidentiality and the governance of visibility. Finally, the entanglement between imaging technologies and the military application only partially acknowledged in our original text has become ever more apparent. Infrastructures developed for surveillance, tracking and territorial mapping continue to underpin consumer hardware and everyday imaging practices, a condition that warrants renewed attention here.

From Surface Mutation to Volumetric Probability

The earlier essay approached photogrammetry as an allegory for the mutative behaviour of black-boxed technologies, reading the torn meshes and misaligned textures as Doc Labyrinth's musical creatures rendered in computational form.[5] What appeared as rips, spikes and folds in the photogrammetric surface were treated as visible wounds in the capture processes, disclosures of the black box's internal logics as it struggled to reconcile fragmentary data with expectations of continuity. Since that moment, however, the imaging 'creatures'[6] have changed. NeRFs are learned 3D representations of a scene, created by training a neural network on multiple photographs. Once trained, the NeRF can render the scene from viewpoints that were never directly

photographed. Gaussian splatting represents a scene as millions of soft transparent 3D Gaussian 'primitives', each carrying its own position, colour, scale, orientation and opacity, which are blended at the moment of rendering. Alongside volumetric moving-image capture, these techniques reconfigure the 3D image as a soft, spatially distributed field rather than a triangulated surface derived from multiple camera viewpoints.

To picture this concretely, imagine moving through the scene Dick gives us at the opening of the story, Doc Labyrinth's lawn with its barbecue pit and modest house, and capturing several hundred overlapping photographs that software triangulates into a textured 3D mesh of the house, the lawn and the small forest behind it. This is the use of photogrammetry most often encountered in cultural heritage work and drone-based survey processes, where an object, site or environment is recorded and understood to be digitally mapped or, indeed, preserved. In this sense, it echoes Labyrinth's hope to save what would otherwise be destroyed in the collapse Dick evokes, as the cracks he sees forming begin to resemble those that once sundered Rome. The computationally generated image-model produced by this process appears as a navigable digital surrogate of the site, experienced through the mediation of the screen. Each visible surface is reconstructed as a set of polygons, with fragments of photographic sensor input mapped across them as texture. Alternatively, to evoke a process Labyrinth might have engaged in when studying the creatures he created, imagine scanning a single insect specimen, the dun-coloured beetle that climbs Labyrinth's red blanket, from many angles to produce a digital double of it, exactly the operation the Biocommunication Group's Insects 360 project performs on a New Forest cicada (*Cicadetta montana*),[7] whose scan can be rotated and looked at from any viewpoint on screen.

A further version of this operation can be imagined not through a photosensitive surface receiving an image, but through an active process of detection. At the close of Dick's story, the narrator drives off alone into the utter darkness, his headlights reaching out so that the road, the kerb, the sycamore and the beetle at its foot return to him only where the beam happens to fall. Similarly, a LiDAR scan does not photograph surfaces or wrap a mesh in photographic texture. It emits pulses of light and measures their return, operating in a manner analogous to radar, but using laser light rather than radio waves. In this form, Labyrinth's world could be imagined not as a continuous picture, but as a scattering of points, present only where something was there to catch the light and absent everywhere else.

Where the same beetle or landscape is processed instead through Gaussian splatting or a NeRF, the visual output takes a different form. Photogrammetry and LiDAR demand the exhaustive, methodical and overlapping coverage described above. By contrast, these other methods can be built from comparatively sparse and looser capture processes, with computational rendering estimating what was never directly recorded, in place of exhaustive measured geometry or sensor-data input. The result is a volume in which surfaces emerge from the accumulation of computationally informed guesswork, much as the creatures emerge from Labyrinth's machine. Such processes often produce seemingly photorealistic outputs, while concealing the underlying mathematics and generative approximation by which those models are

produced. The polygonal mesh and its photographic texture map give way to something closer to a cloud of optical likelihoods, reminiscent of Dick's evocation of mist in the woods beside Labyrinth's house.

Each splat is a soft point in space, carrying information about its position, colour and the extent to which it spreads into the surrounding image. The opacity of each splat is not simply measured. It is estimated through probability, shaping how much each soft point contributes to the rendered image and how it blends with neighbouring splats. These fields are often made by combining different kinds of recorded data, such as LiDAR scans, photographs and video. These inputs are brought together to form a radiance field, whose shape is secured not by direct measurement alone, but by a process of computational adjustment known as 'gradient descent'.[8] Jussi Parikka's notion of the 'invisual'[9] is helpful here for understanding how these processes function: these are images whose decisive operations occur within layers of computation that never resolve into a stable, human-legible surface, complicating any straightforward link between spatial referent and image trace. The image becomes a negotiation between what has been captured and what the model infers, rather than a stable record of what stood before the lens or scanner.

If earlier photogrammetric work dwelt on 'fractional space'[10] as a condition of incomplete surface, holes, phantom planes and polygonal spikes, PVIs relocate this fractionality into the model's interior. In Tom Milnes's account,[11] photogrammetry is already a layered composite of mesh and texture, a spatially-immersive networked composite in which distinct computational strata (point clouds, surfaces, image skins) are sutured into a navigable whole. Gaussian splats and NeRFs push this logic further: they dispense with explicit surface altogether, modelling radiance and density continuously across space. Errors, occlusions or conflicting viewpoints no longer necessarily erupt as visible mesh failures. Instead, low-confidence regions[12] are smoothed, interpolated and regularised, subsumed into a field that presents itself as seamless even when built from sparse or contradictory data. The 'blind spots'[13] of computation persist, but they are displaced inward. Mutation becomes latent, encoded in weighting schemes and loss functions rather than manifested as spectacular ruin. Contemporary images are not misrepresentations of a fixed scene so much as reconstructions assembled from computational suppositions, occupying a domain in which evidence is inseparable from prediction processes shaped by expectations derived from training data.

Recent writing on volumetrics, the broad term for techniques that model continuous 3D space, where every point in a volume carries values such as density, colour or probability, (including critical accounts of neural radiance fields and Gaussian splatting), supplies a vocabulary for tracing the transition from surface-based artefacts and glitches toward volumetric image forms organised as probabilistic fields. Jara Rocha and Femke Snelting describe volumetrics as a regime in which bodies and spaces are continuously measured, quantified and governed, drawing attention to how volumetric infrastructures enact forms of sorting and control.[14] Within this context, Helen Pritchard's notion of 'clumsy volumetrics'[15] advocates friction, error and non-normative embodiment as tactics for disturbing the smooth governance of what Jussi Parikka terms 'measurement images'.[16] The crystalline fissures, foggy

volumes and granular voids that appear in Gaussian-splat renderings when optimisation falters can be read in this vein: as sites where probability fails to fully domesticate uncertainty, and where the field briefly discloses its constructedness. Johannes Pöll and Raphael Schaumburg-Lippe's work[17] on the relation between memory and technology extends this discussion to the temporal and what they term the mnemonic[18] dimensions of PVIs. Taking their *Ars Electronica* installation as a case study, they approach Gaussian splatting as an animated memory apparatus in which volumetric space is continually re-written, layered and eroded, rather than preserved as a stable archive. Their emphasis on 'shattering'[19] underscores how splatted scenes oscillate between coherence and breakdown, staging memory not as faithful replay but as performative reconfiguration.

In this, their work resonates closely with Dick's narrative: Labyrinth's creatures, like contemporary volumetric images, survive only by changing beyond recognition, their very capacity for preservation dependent on ongoing mutation. The shift from surface mutation to volumetric probability does not resolve the tensions described in the original essay. Instead, it moves them into a different part of the image-making process. Against this backdrop, attending to the seams, fogs and fractures of volumetric renderings becomes a way of staying with the mutations of the *Preserving Machine* as it migrates from mesh to field, from torn surface to probabilistic volume.

From Capture to Synthetic Generative Processes

Sensor-based photogrammetric processes, however computational, maintained a relation to sensory input, preserving a complex yet diagrammatic relationship between capture, black-boxed algorithmic computation, and image output. The conditions of contemporary imaging have shifted with the emergence and dominance of new forms of relationality afforded by current computational systems. Generative AI systems now produce images, sound, video and 3D forms through textual or image prompts, statistical inference and prediction processes. Their outputs belong not to documentation as such but to a computational imagination, attempting to mimic what Lev Manovich describes as 'photorealism',[20] which could be further understood as the extent to which a computer-generated image evokes the 'reality effect'[21] of a photograph. The primacy of capture may, in future iterations of 3D technologies, give way to increasingly synthetic modes of reconstruction, aided by diffusion-based and other generative models.

Text-to-3D processes generate three-dimensional objects from textual prompts by drawing on pretrained models that link linguistic descriptions with visual representations learned from large training datasets, rather than from direct measurement of the physical world. In systems such as DreamFusion,[22] a pretrained text-to-image diffusion model guides the optimisation of a 3D representation so that its rendered views conform to the prompt within specific aesthetic and conceptual registers, while models like Point-E[23] generate an image and then construct a 3D point cloud conditioned upon it. These approaches can produce geometry and textures that are exportable as usable assets for software such as Blender, Unity or Unreal Engine,

yet their surfaces and structures reveal the statistical and model-derived nature of their generation rather than any anomalous forms of sensory capture.

Though these imaging forms are frequently associated with gaming assets, they also imply a different critical potential. Fred Ritchin, while sceptical of the ideological and political uses of synthetic imagery,[24] nonetheless identifies a capacity absent from traditional documentary photographic practice: the ability to generate photorealistic images of possible futures. Such images, he argues, might operate to show us the catastrophe of the future—prompting reflection or intervention before catastrophe occurs, rather than singularly contributing to the accumulation of dystopian imagery after the fact.[25]

However, as these systems generate 3D assets, the underlying structure of the surface, the way a 3D shape is organised and held together, begins to distort around the predictive tendencies embedded in the model, turning the surface into a site of algorithmic completion rather than a constraint of materiality or capture process. As Nicolas Malevé argues, drawing on Douglas Crimp's account of the museum in ruins,[26] the data set 'is not merely a collection of photographs, it is an arbitration between different forms of alignment'.[27] These generated 3D objects occupy a space between possibility and artefact, fabricated from residues of datasets including Sketchfab models, game-engine assets, scraped 3D libraries, satellite imagery and built-in digital assumptions shaped by training data. They inherit behaviour through patterns extracted from images rather than through embodied negotiation with the world as experienced through human eyes, producing recognisable yet estranged forms of relationality.

The conditions for text-to-3D generation are also different from those that shaped text-to-image systems. Text-to-image models have been trained on vast collections, literally billions, of image-text pairs, while comparable quantities of labelled 3D data have been far more limited. Systems such as DreamFusion[28] were designed to partly bypass this problem by using pretrained 2D diffusion models, multi-view image generation and optimisation processes that infer 3D form by repeatedly testing how an object might appear from different viewpoints. This type of process has made text-to-3D generation more accurate and widely available, particularly for producing bespoke 3D objects for independent or do-it-yourself games production.

This notwithstanding, these objects still rely heavily on computational guesswork, adjustment and correction. Some of this correction takes place inside the model, but some also happens manually once the object is brought into 3D software, where it may need to be cleaned, repaired, retextured or adapted for use, particularly in the context of advertising or gaming, which require adherence to a particular kind of aesthetic sheen. Text-to-3D generation is thus a potential space of exploration and creative play, similar in some ways to the early use of text-to-image diffusion models, where unexpected outputs became part of the appeal of working with the system. In this case, however, the surprises are less often produced through extra limbs or distorted bodies, and more through the aesthetic and structural limits of the generated object itself, where broken textures, seams, gaps and forms that recall the rips and tears foregrounded by Steyerl abound.

Even when generative systems appear to produce endless variation, they remain tied to the representational grammars present in their training data. Structural bias,[29] harmful or traumatic imagery[30] and longstanding racialised and gendered taxonomies[31] are embedded through both conscious and unconscious processes of coding and data selection.[32] As AI-generated images, video and 3D assets become more closely connected, these inherited patterns become harder to locate within any single medium. AI-generated photorealistic video can now be converted into Gaussian splats, making the boundary between sense-data inputs derived from measured geographic terrain and the synthetic realisation of such forms, traditionally associated with game engines or CGI for mass-media production, considerably more complex.[33]

These processes rely on intensive energy consumption and mineral extraction;[34] there is also a great deal of human work involved in making the systems function, such as people labelling images or reviewing harmful content, often from the global majority and under extractive exchanges of labour,[35] yet this labour is kept out of sight through platforms such as Amazon's Mechanical Turk.[36] None of this appears explicitly in the final image or interface, so the question for us, and for others working in this terrain, is how such conditions can be acknowledged and made visible within critical work.

AI-generated imagery has repeatedly reproduced racialised, gendered and authoritarian tropes embedded in training data and online visual culture, as demonstrated in studies such as 'Stable Bias: Evaluating Societal Representations in Diffusion Models'.[37] These patterns reveal how representational limits and infrastructural harms are tightly intertwined, producing what Donna Haraway might call a regime of authorised seeing,[38] shaped by the broader economic and cultural environment of contemporary AI development, where rapid technical expansion, limited governance and platform-driven incentives allow harmful outputs, including deepfakes,[39] to proliferate and settle into everyday visual culture.

The Infrastructural Conditions of Contemporary Imaging

While the original essay acknowledged the proximity between imaging technologies and military research, its focus was on preservation and its relation to 3D imaging and cultural heritage, rather than on the extent to which contemporary computational vision depends on infrastructures forged within spaces such as military applications. Systems developed for surveillance and threat-modelling underwrite consumer hardware and imaging.[40] Read alongside *The Preserving Machine,* this is not incidental: Dick situates the story within a post-war academic environment in which colleagues take on defence-orientated research contracts, a milieu that anticipates imaging systems in which simulation and pattern analysis manage uncertainty and render potential adversaries calculable,[41] technologies that share developmental lineages with those now used in heritage preservation, entertainment, medicine and civil engineering.[42]

Originating in the 1960s for range-finding and weapons guidance, LiDAR systems were designed to project pulses, measure returns and convert distance into actionable

data.[43] The same principles now underpin handheld scanners, depth cameras and volumetric capture processes whose apparent neutrality as 'reality capture' obscures their place within operational images made to orientate systems, direct force and automate decisions.[44]

The Initial Graphics Exchange Specification (IGES), developed in the late 1970s by the US military and Boeing as the first open Computer Aided Design (CAD) exchange format for the aerospace industry, rationalised geometric data across contractors.[45] When LiDAR-generated point clouds are converted into meshes, exported via IGES and sent to Computer Numerical Control (CNC) machining or 3D printers, the workflow silently reproduces an infrastructural logic that treats space, bodies and materials as data to be standardised, exchanged and re-materialised within a machinic regime.[46]

The methods by which point clouds are constructed, and the processes of tracking, tracing and sensing bodies in space, cannot be separated from adjacent fields such as military surveillance and medical imaging,[47] which employ similar abstractions to visualise bodily movement or formation as are present in Étienne-Jules Marey's chronophotographic experiments.[48] Marey's techniques find contemporary expression in how computer technologies interpret and model environments and living beings through pattern recognition, reconstituting them as a 'non-human spectral visualization of data'.[49] anticipating algorithmic forms of envisioning.

Situating LiDAR and IGES within this genealogy clarifies that contemporary 3D imaging is not merely supported by militarised infrastructures but constituted through them. *The Preserving Machine*'s concern with cultural forms transformed by an apparatus they were never designed to withstand finds its echo here: the creatures of computational imaging are products of security logics and measurement regimes that actively shape the forms they take.

In the context of contemporary conflict and the rise of autonomous systems for target recognition, however, such 'creatures' must now be read differently. What once seemed like a release from imperial logics and systems of oppression now appears as the emergence of entities whose operational autonomy may be lethal,[50] and through which the regimes of military intentionality are a genetic imprint or, more accurately, a condition of alignment. Labyrinth's horror is thus not merely a failure of control but an encounter with a transformation of the apparatus itself, a culpability he ultimately chooses to ignore in the story's final retreat: 'I drove away'.[51]

Preservation After Synthetic Capture

In terms of where we might pick up this line of inquiry, there are still considerations the original text could not address. One is the extent to which *The Preserving Machine* also functions as a metaphor for contemporary experiments in genetics and other biological processes. David Farrier makes this connection explicitly in *Footprints: In Search of Future Fossils*,[52] correlating Dick's story with contemporaneous developments in DNA science and with practices such as Renata Ferrari and Will Figueira's 3D-printed coral reefs.[53] He also notes biological data-storage projects that literalise Dick's conceit, in which cultural artefacts encoded into DNA or microbial life

produce new entities whose capacities exceed the intentions of their makers, or, more accurately, in the case of Christian Bök as instigating creative interlocutation between Bök, Ovid's *Metamorphosis* and *Deinococcus radiodurans*.[54]

Given these connections, the relevant question for this reflection, centred on what an image is now, is not only how speculative fiction can be used to understand imaging technologies, but what is at stake in the speculative frameworks that scaffold technological futures. Our original strategy of reading Dick alongside photogrammetric practice now sits within a broader discursive field in which speculative fiction and long-range thought experiments associated with the concept of the singularity[55] have become central to how narratives of technological futurity are narrated and justified.

Whether or not the existential risks imagined in these scenarios are inevitable, the propositions direct attention towards the danger of runaway optimisation, AI systems becoming lethal at an extinction level,[56] while the ongoing harms of the present require other forms of attentiveness to examine.[57] The question posed of Labyrinth's creatures – What happens once they exist in the wild? – returns with renewed force in relation to contemporary imaging systems. This question is complexified when placed alongside Trevor Paglen's analyses of machine-to-machine forms of communication,[58] in which images increasingly function as operational entities circulating within systems that exclude the human as primary addressee. Images are produced, evaluated and acted upon by infrastructures that remain opaque, black-boxed and globally distributed.

Revisiting 'The Photogrammetric Image and Black Boxed Mutative Automation' through this expanded lens makes clear that the concerns articulated in the earlier text have not diminished but diffused across new domains. What once appeared as rips, spikes and ruptures in the photogrammetric mesh now manifest as latent operations of volumetric inference, synthetic reconstruction and generative hallucination, nested within the infrastructural governance of platforms, clouds and alignment regimes. In this configuration, the Preserving Machine of contemporary computational imaging no longer only distorts or misaligns referent input data; it generates the synthetic environments that underpin contemporary practices and ideologies of world-building. Their apparent stability is less a sign of fidelity to sensed input than of the system's successful inference from its training data. They inhabit the spaces between capture and computation, between world and dataset, between situated experience and speculative projection. It is within these infrastructures that lies the question of what an image is, as imaging continues to mutate beyond inherited conceptual frameworks and languages.

AI Disclosure

In preparing this article the authors made use of the generative AI tools Claude Opus 4.8 and OpenAI, GPT-5.5 Thinking. These tools were used in three ways: to help clarify and unpack technical details of the computational imaging processes discussed, with the resulting explanations manually cross-referenced against peer-reviewed and other scholarly sources; to assist with spelling, grammar and the refinement of language in places; and to support the identification of critical and scholarly source material, particularly in

relation to concepts specific to technical details of computational imaging processes. No generative AI tool was used to create, alter or manipulate any images, figures, formulae or research data. The intellectual content, analysis and arguments presented are the authors' own original work. All AI-assisted outputs were reviewed, verified and edited by all three authors, who take full responsibility for the accuracy, validity, originality and integrity of the content. The authors confirm that this use of generative AI tools is consistent with the Taylor & Francis AI policy.

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

Funding
No funding was received.

TOM MILNES is an artist, curator and researcher based in the UK. He is a Research Fellow at the Centre for Blended Realities, Falmouth University. His research practice explores the materiality of imagery and technology, engaging with the cultural impact of media through glitches, errors or hidden subcultures. His practice explores the aesthetics of digital imagery, incorporating emergent technologies such as photogrammetry, augmented reality and NetArt methods, often through sculptural or immersive experiences, as ways to challenge our relationship to digital technology and the physical world. He has published research papers in the *Journal of Artistic Research* (JAR) and *Visual Resources*. He has exhibited internationally including at: W139 (Amsterdam), AND/OR (London), CEAC (Xiamen), The Centre for Contemporary Art Laznia (Gdansk) and Gyeonggi International Biennale (Korea). He recently curated the exhibition Rolodex Propaganda at KARST, Plymouth (April 2024). He is the curator of the online platform Polygon Palm.

PETER AINSWORTH is a visual practitioner, researcher and course leader for MA photography and digital practice at LCC UAL. His practice-based PhD, completed at Goldsmiths in 2025, examined computational imaging processes, including photogrammetry, LiDAR, mobile 3D capture, AR, XR, gaming platforms and AI mediation. Its practice output, The Museum of Computational Image Artefacts (MoCIA), is a virtual exhibition space examining how computational imaging reshapes the conditions under which museum objects are seen, experienced and interpreted. His research has been presented at the Photographers' Gallery (Material Memory and the AI Archive, 2025; Photography in Virtual Culture, 2024). He has published in *Visual Resources* and *Philosophy of Photography*, and his visual practice (spanning photography, video, AR and 3D imaging) has been exhibited internationally, with work held in the Museum of Fine Arts, Houston.

SAM PLAGERSON is an artist, an associate lecturer at Cambridge School of Art and a PhD candidate in the department of Fine Art at Goldsmiths University. His practice-based research focuses on the ever-increasing desire to attain more realistic virtual humans, exploring the power structures that utilise 3D capture technologies as paradigmatic of the biopolitical apparatus from which these representations emerge at the intersection of science, entertainment, military and governmental administration. His writing has been published in *Visual Resources*. His exhibitions include False Friends, The Function Suite, London; Things on things, Maverick Projects, London; Image Object, Furini Arte Contemporanea, Rome; Tryouts, Downstairs Gallery, Herefordshire; Bloomberg New

Contemporaries; and Pop Will Eat Itself, Art on the Underground. He was the recipient of a Henry Moore Artist Fellowship Grant and an award from the Eaton Trust.

Notes

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ORCID
Tom Milnes http://orcid.org/0000-0002-5181-2063