Sensographic Encounters

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Introduction

This chapter examines how emerging imaging technologies are reshaping relationships between photography, memory, and temporality. Drawing on a practice-based investigation using LiDAR, photogrammetry, and augmented reality (AR), it argues that expanded photographic practices transform photography into a performative *sensographic encounter*. I use this term to describe the interaction of machine sensing, embodied movement, and expanded photographic image environments, and explore how memory is performed within these contexts.

Building on Joanna Zylinska's concept of 'sensography' (2023), I develop the notion of the sensographic encounter to account for situations in which photographic images are actively navigated and co-produced through embodied interaction. The idea that photographs represent static, two-dimensional, visual records of the past is outdated; contemporary photographs are 'a multisensory medium whose operative mode relies on sensors and various measuring and calculating instruments as much as it does on optical devices' (Zylinska, 2023, p. 194). The specific affordances of these active sensing technologies, combined with memory work methodologies, reveal the processes of temporal folding and layering within newly expanded forms of photography. In absorbing sensing devices into the production of photographic seeing, new potentials arise to explore temporality as it is represented within three-dimensional image environments. This has significant implications for the ways in which photographic images are used within practices of remembering.

I argue that sensographic encounters illuminate three interconnected conditions of contemporary memory within digital image systems: mnemonic assemblages, in which memory is relational and distributed; durational multiplicity, in which multiple temporalities overlap; and temporal dissonance, in which those temporalities come into friction. Together, these concepts provide the framework through which the chapter's three practice-based projects are examined.

The research is grounded in the development of experimental 3D photographic practices through which I have constructed an archive of vernacular images of family life. Encountered within hybrid digital-physical environments, these works explore how remembering unfolds through bodily movement and spatial interaction with computational image systems. This experimental practice generates multiple forms of data, including 3D photogrammetry models, point clouds, augmented reality files, depth maps, 2D projections, and hybrid visualisations. Each form offers a different perspective on the relationship between image, data, perception, and memory, contributing to a methodology that privileges variation, transformation, and process over stability and closure. The resulting works function as sites for exploring the temporal, spatial, and affective dimensions of remembering.

Complementing this practice-based approach is autoethnography, which provides a methodology for attending to how these encounters are lived and experienced. Working with my own photographic archive, I document experiences through written reflection, screenshots, audio recordings, and movement tracking within augmented reality environments. This reflexive process extends Annette Kuhn's concept of memory work (2010) into spatial and durational contexts, positioning the researcher as both subject and participant within the environments under investigation.

By situating this inquiry within broader debates concerning photography, sensing, and memory, I examine how remembering unfolds within computational image environments and explore the temporal complexities that emerge through these encounters.

A Memory of Photography

The questions explored in this chapter emerge from a long-standing relationship between photography and memory. To understand how contemporary imaging technologies transform that relationship, it is first necessary to consider how photography became associated with practices of remembering. Art historian Geoffrey Batchen presents 19th Century portrait photography as evidence of this, relaying American writer Oliver Wendell Holmes phrase from 1859 'the mirror with a memory' (2004, p. 8), to reflect a widespread view of photographs as synonymous with memory. Photography's ability to capture a moment from a specific viewpoint created the illusion that an experience in time could somehow be frozen and revisited at a later point. In analogue photography, light reflected from an object leaves a material imprint on a photosensitive surface, establishing what was widely interpreted as a direct connection between image and referent. This indexical link framed the photograph as a physical trace of reality, seemingly providing a gateway to the past.

In *Camera Lucida*, Roland Barthes intensified this claim with his formulation of the photograph as 'literally an emanation of the referent. From a real body, which was there, proceed radiations which ultimately touch me, who am here.' (Barthes, 1993, p. 80). For Barthes, the photograph acts as a 'certificate of presence', and its defining essence, the 'that-has-been', is the *noeme* that distinguishes photography from all other visual forms (p. 87). Within this framework, the photograph's ontological status is inseparable from its temporal function, it testifies to a past moment that has existed and is now accessible only through the image. Photography thus appears as a stabilising force, anchoring memory in material form.

Within this context, the family photo album became central to the formation of family identities. The material qualities of analogue photographs provided a tangible site through which a sense of continuity and stability could be sustained. Memories coalesced around these seemingly fixed images, embedding cultural habits of remembering within everyday life. Annette Kuhn (2007) argues that personal and family photographs are key to understanding how memory operates as a cultural, social, and interpretive practice. Her concept of memory work treats memories prompted by photographs as material to be analysed and interpreted, offering a methodological approach to examining these practices. Rooted in their analogue form, family photographs functioned as both repositories and generators of memory, embedding practices of remembering within everyday photographic objects. The question then arises, how does memory operate with contemporary images that are mobile and increasingly computational?

The relationship between memory and photography has been profoundly unsettled by digital technologies which fundamentally alter the conditions under which images are produced, stored, and encountered. The photograph in its printed, material form has largely receded from everyday life, replaced by digital screens displaying data stored on devices and network servers. The transition from analogue to digital imaging marks a shift in the ontology of the photographic image, transforming it from a discrete material object into a mutable, networked

form of data. The tactile qualities of printed photographs, handled, passed around, annotated, and embedded within domestic spaces, situated memory work within everyday life. With photographic encounters now mediated through screens, traces of physical interaction are often simulated rather than directly experienced. Digital platforms such as Instagram and Facebook recreate analogue aesthetics through filters, grain effects, and curated 'memories' feeds, charging the image with the semiotics of nostalgia, memory and time, even as the underlying structures of image production and circulation are radically transformed.

These shifts have significant implications for how images function as memory devices. The indexical relationships that once underpinned photographic theory, the idea that the photograph bears a direct physical trace of what it depicts, was brought into question when images were no longer tied to a chemical process of inscription. As digital files, photographs became infinitely reproducible, easily manipulated, and detached from any singular material origin. Barthes' *that-has-been*, central to twentieth-century photographic theory, has been widely challenged through digital manipulation, simulation, and debates around post-photography. To respond to this new visual landscape and account for emerging forms of image-making, sharing, and consumption, Andrew Dewdney of the Centre for the Study of the Networked Image argues for the need to 'forget photography' in order to free it from what he sees as the constraints of art history and photographic theory, and reveal 'other relationships between bodies, times, events, materials, memory, representation and the image' (2021, p. 4). Dewdney's intervention is significant because it acknowledges how deeply the photographic image has become entangled with our perception of the world, seeping into virtually all aspects of human experience, politics, and society. He therefore proposes the need for new ways of thinking with photography that embrace different knowledge systems, moving beyond historically imposed boundaries between mediums, technologies, sciences, and socio-cultural frameworks.

One way of developing this methodological shift is through theories of the networked image. In attempting to address the question 'What is Twenty-first Century Photography' Daniel Rubinstein argues for a focus on processes rather than representations, that these are more relevant to a world of 'speed, acceleration, distribution and self-replication' (2016, p. 158). Concepts such as the networked image and the algorithmic turn describe the effects of the internet, social media, and algorithmic systems on photography. Images now exist primarily as data within computational infrastructures, stored remotely, processed algorithmically, and circulated through networks that shape their visibility and accessibility. In this context, images operate within a dynamic flow rather than as fixed entities. As Rubinstein and Sluis observe, this new form of image is 'continuous, frameless, multiple and processual, it cannot be unpacked with the tools of semiotics and structuralism that were developed to deal with finite, framed, singular and static images' (2013, p.31).

How, then, might these dizzying new forms of data that we call photographs be understood? And how do they relate to personal and social practices of memory and remembering?

From Photography to Sensography

As an investigation into how memory is experienced through new forms of digital imaging technologies, this research requires a conception of photography that extends beyond its

historical association with optical representation and indexical recording. Recent scholarship has increasingly questioned whether photography should be understood as a stable medium at all, proposing instead that it operates as a shifting constellation of practices, technologies, and cultural conventions.

Paul Frosh's discussion of how to understand the notion of "seeing photographically" offers a useful starting point for understanding these transformations. Frosh (2024) argues that photography now functions not only as a medium but as a cultural mode of perception. Photography persists through changing technologies because it survives as a form of cultural memory, actively reproduced through institutions, technological design, social practices, and representational conventions.

This is particularly useful because it shifts attention away from photography as a fixed technological form and towards photography as a culturally remembered way of perceiving. For Frosh, the phrase "seeing photographically", does not simply describe the technical operation of a camera but invokes a historically accumulated set of assumptions concerning evidence, temporality, expression, and experience. Photography survives because these assumptions continue to be performed and reproduced across new technological contexts. What is remembered is not any singular photographic technology but a broader cultural understanding of what photography is and what photographs do.

This understanding of photography as a form of cultural memory resonates strongly with Joanna Zylinska's account of contemporary image culture. Zylinska similarly resists medium-specific definitions, proposing instead that we can describe any ‘given cluster of processes and practices “photography” if it remembers and resembles photography – and if it looks and feels like photography to the human observer’ (2023, p. 4). Photography therefore persists not because its technological form remains stable but because particular ways of seeing, sensing, and understanding images continue to be recognised as photographic.

This shift becomes increasingly important in a world shaped by computational image systems. Zylinska's concept of sensography extends photography beyond optical representation by focussing on the role of sensing technologies, measurement systems, and computational processes in image production. For Zylinska, photography is now ‘a multisensory medium whose operative mode relies on sensors and various measuring and calculating instruments as much as it does on optical devices’ (2023, p. 194). These technologies not only transform photography as an operational medium, they also transform the conditions through which we encounter and understand the world, increasingly navigating environments ‘surrounded by image flows and machine eyes’ (2023, p. 194). This is a world of social media feeds, Google Street View, AI, CCTV, drones, satellite imaging, endoscopies, and 3D mapping, produced by devices capable of perceiving far beyond human vision and often for distinctly ‘nonhuman’ purposes (Zylinska, 2017).

Together, Frosh and Zylinska suggest that photography is no longer best understood through the properties of any particular medium. Instead, it persists through cultural memory while simultaneously expanding into new technological forms. Photography becomes less a discrete

object than a set of practices, conventions, and perceptual operations that continue to evolve through computational systems.

If sensography expands photography beyond optical representation, however, a further question emerges, what exactly is being sensed? It is here that Yanai Toister's discussion of sensing becomes particularly valuable. For Toister (2024), sensing operates as a broader category than vision, referring to processes through which information is acquired for knowledge production and decision-making. This formulation is significant because it moves discussion beyond ocularcentrism and allows imaging systems to be understood through wider sensory operations.

Technologies such as LiDAR exemplify what Toister terms active sensing, systems that emit signals into the environment and gather information from their return. As he writes, ‘Active sensing is therefore the act of receiving and/or detecting waves which are being purposely emitted or transmitted for the sake of sensing one's environment’ (2024, p. 265). In contrast to passive visual reception, active sensing participates directly in the construction of environmental knowledge. Drawing on examples such as the echolocation practices of bats and dolphins, alongside forms of machine perception, Toister demonstrates how environmental understanding can emerge through sensing processes that do not depend upon conventional sight.

His formulation is particularly significant because it relocates photography within a broader field of sensing practices. Rather than treating visual knowledge as inherently dependent upon light-based vision, Toister reformulates what he describes as the reciprocal triangular relationship between sensing, visuality, and knowledge. In this framework, sensing becomes ‘the utilisation of any sensory ability (or combination of abilities) for knowledge acquisition and decision making’ (2024, p. 264), a formulation that expands photography beyond exclusively visual models of perception.

For the present research, Toister's intervention is important because it opens a way of thinking about memory through sensing rather than representation. While Toister is primarily concerned with the relationship between sensing, visuality, and knowledge, the works discussed in this chapter suggest that sensing also participates in the production of remembering. My question is not only how sensing technologies generate knowledge about environments, but how they generate encounters through which memory can be actively engaged with. This becomes particularly significant in relation to LiDAR, photogrammetry, and augmented reality systems, where bodily movement, machine sensing, and computational image production become intertwined within acts of remembering.

Taken together, recent scholarship provide important frameworks for understanding how photography is being transformed by computational technologies. Dewdney (2021) and Rubinstein (2013, 2016) focus on the changing ontology of the image within networked and algorithmic systems. Frosh (2024) examines photography as a cultural mode of perception, while Zylinska (2017, 2023) extends photography into the domain of sensing technologies

and machine vision. Toister (2020, 2024) relocates photography within a broader field of sensing practices that exceed human sight, while Parikka's (2012) media-archaeological approach situates contemporary imaging technologies within longer technological and material histories.

Yet despite these important interventions, less attention has been given to how practices of remembering are reshaped within embodied encounters with expanded photographic environments. While Digital Memory Studies has generated important insights into what Andrew Hoskins describes as a ‘new memory ecology’ (2018, p. 27), examining how digital technologies reshape the production, circulation, and experience of memory, comparatively little attention has been paid to forms of remembering that emerge through active sensing systems, spatial image environments, and embodied interaction. The implications of these developments for contemporary photographic memory practices therefore remain somewhat underexplored.

It is within this space that I situate the concept of the sensographic encounter. Building upon Zylinska's sensography, Frosh's cultural memory of photography, and Toister's active sensing, the sensographic encounter describes situations in which machine sensing, embodied movement, memory, and spatial experience become entangled. Whereas sensography identifies the growing role of sensing technologies within contemporary photography, the sensographic encounter focuses on what occurs when such systems are inhabited, navigated, and experienced through the body.

Understanding these encounters is particularly important for memory studies because they reveal how remembering unfolds within increasingly hybrid configurations of human and computational perception. Memory is not organised solely around stable photographic objects that function as repositories of past experience. Instead, remembering takes shape through interactions with systems that continually recalculate, spatialise, and reconstruct image data. The significance of these technologies therefore lies in how they transform the conditions through which memory is experienced and produced.

Understanding photography through the concept of the sensographic encounter therefore shifts attention away from images as stable records and towards the conditions through which remembering is enacted. This perspective prioritises the relations through which memories take shape in interaction with bodies, environments, sensing technologies, and computational processes. It also avoids what Frosh describes as the ‘collapsing of the distinction between the image and the experienced moment it represents, or the memory it might become’ (2024, p. 67). Because rather than treating memory as something contained within photographs, the sensographic encounter understands remembering as an ongoing and situated process.

Expanding the image

If photography can no longer be adequately understood through models of indexical representation, and if contemporary images increasingly operate through sensing systems and computational processes, then alternative methods are required for investigating how memory functions within these environments. The practice-based research presented in this chapter

emerged from this problem, it responds to the calls to *forget photography* (Dewdney, 2021) and develop new frameworks for examining expanded forms of the image by using artistic practice as a means of exploring how memory, embodiment, and temporality are reshaped through encounters with computational image systems.

Within this new sensographic landscape, my practice-based research focuses on images generated from 3D data captured using combinations of LiDAR[1], photogrammetry[2] and 3D Video[3]. Through a series of experimental methods, I have created an autobiographical archive of 3D images to investigate how these expanded images behave when exposed to different memory practices and forms of embodied interaction. The archive comprises three interconnected bodies of work, *3D Snapshots*, *Durational Objects*, and *Spaces Between*, each exploring interrelations between expanded photographic imaging, memory, temporality, and embodiment. Together, these projects function as a practice-based inquiry through which these interrelations are explored experimentally rather than resolved theoretically. The following sections examine each body of work in turn, tracing how these concerns are negotiated through different methods.

3D Snapshots

The first of these practices, *3D Snapshots*[4] (see Figure 1), uses iPhone LiDAR scanning and photogrammetry to capture everyday experiences accumulated over a five-year period. While these technologies generate 3D data through depth sensing and the reconstruction of surfaces from multiple photographic bursts, my use of them adopts the spontaneity of snapshot photography rather than the precision often associated with computational imaging. Scans are typically made in around ten seconds, using handheld movement through a scene rather than a singular exposure. In this sense, the work extends the vernacular tradition of the snapshot, traceable from the Kodak Brownie to the camera phone, towards a different kind of personal memory archive: one in which the image can be entered, navigated, and experienced spatially rather than encountered from a fixed perspective.

[1] LiDAR measures depth within an environment by emitting pulses of infra-red or laser light that is reflected back from solid objects and translated into 3D data points.
[2] Photogrammetry refers to the process of creating digital 3D objects from multiple overlapping photographs, taken from different angles and algorithmically combined to create surfaces wrapped around a 3D mesh.
[3] 3D video is used here as a term to refer to videos that have depth information embedded alongside their 2D camera image data. This depth information can come from LiDAR point clouds, colour depth maps, or in the case of Apple's new 'spatial video' from the combination of normal and ultrawide lenses mapped into a single file.
[4] Additional images and videos of the work are available here: https://aronspall.co.uk/Space-Becomes-Screen

Figure 1. *3D Snapshots (AR View), 2022*

This approach deliberately embraces incompleteness, instability, and accident. The resulting images are often fragmented, partially rendered, or marked by glitches, warped textures, and missing data. Rather than treating these as technical failures, I approach them as essential constituents of the work. As Hito Steyerl suggests in her writing on the 'poor image' (2009) such visual forms reveal gaps, distortions, and blind spots that resist seamless representation. In *3D Snapshots*, these fractured images flicker between recognition and abstraction.

This incompleteness is shaped by the particular ontology of these image forms. Because these types of 3D images are captured from a single point, they are sometimes described as *2.5D*, or, as Hito Steyerl suggests, as occupying 'a space between surface and volume […] it sits between dimensions and connects them' (2017, p. 197). This condition produces characteristic gaps behind objects and figures within the image, blank data shadows that become perceptible, and even navigable, as the viewer moves into and through the image space. While this movement makes a form of spatial immersion possible, these gaps simultaneously frustrate an innate drive toward completing the image. These image objects seem always already incomplete.

As Steyerl notes, what would remain outside the frame or masked in a 2D image is 'assigned a volume or a body' (2017, p. 197). Yet what emerges is not simply an image *of* a body, but what she calls the *body of an image*: a peculiar visual object that oscillates between surface and depth, presence and absence. In attempting to produce three-dimensionality, these images often draw attention back to their own unstable surfaces, exposing traces of the technological

and political forces through which they are constituted. In this sense, their fragmented aesthetic is not merely a technical limitation but a record of the conditions of their making.

I understand these traces as carrying a kind of hauntological presence (Fisher, 2012). For me, the works contain or trigger memories of people and events from the past, but they also hold a memory of the technologies through which they are produced; the histories embedded within sensor driven systems, computational imaging, and origins, for example, in computer game design. The image, in this sense, moves beyond autobiographical memory and becomes a *mnemonic assemblage*: a distributed configuration of personal memory, technical systems, media histories, computational processes, and embodied encounters. Memory is not contained within any one of these elements but produced through their ongoing relations.

In exhibition, these works were presented as 3D images of family and friends positioned in augmented reality and encountered through a framed handheld screen. Viewers were invited to move through the gallery while physically navigating the digital image fragments at human scale. This transformed viewing into an embodied activity, requiring participants to negotiate relationships between their own bodies, the surrounding physical environment, and the digital image space.

My research aim in exhibiting the work was to examine how material and spatial qualities affect the temporal dynamics of 3D photographic images, particularly in relation to memory. Findings, drawn from reflection, observation, and dialogue with visitors, suggested that these works generated affective responses through movement in and around this hybrid digital-physical space. For me, bodily navigation through the scenes reactivated memories of the original events, allowing me to situate myself within remembered experience at human scale. For other viewers, whose responses were not grounded in autobiographical memory, affect emerged through spatial and bodily engagement with the images themselves.

Responses repeatedly returned to qualities of fragility, digital ruins, membranes, and sculptural fragments. Participants described disorientation between digital and physical space, sometimes experiencing a form of cognitive conflict as they moved through these unstable image environments. The work begins to suggest differences in how memory is experienced through these expanded photographic forms: through embodied movement, sensory negotiation, and affective encounter.

Methodologically, this work is informed by Erin Manning's speculative pragmatism, which begins, as she writes, with 'a rigour of experimentation. It is interested in the anarchy at the heart of all process' and attends to the excesses that escape order and generate new modes of knowledge (2016, p. 38). This framework is particularly important to my treatment of glitches, distortions, interruptions, and computational inconsistencies, which I approach not as errors to be corrected but as productive excess. These elements reveal the image as partial and processual, a site where memory is assembled through gaps and traces. In this way, they shape the experimental logic through which the project evolved, directing the research toward incompleteness, and the generative potential of unstable image forms.

Within this experimental logic, *3D Snapshots* demonstrates how sensographic encounters produce mnemonic assemblages. The fragmented image becomes a site in which heterogeneous forms of memory enter into relation, bringing together autobiographical memories of family life, technological memories embedded within sensing systems, media-

historical traces, and the embodied experiences of viewers navigating the work. These elements form an assemblage through which remembering is continually produced. Memory emerges through their interactions, taking shape across a network of relations.

Durational Objects

Building on the fragmented and incomplete image structures explored in *3D Snapshots*, this second body of work *Durational Objects*[5] (see Figure 2) shifts attention toward the temporal conditions through which such images are produced and encountered. It extends this investigation by exploring the ontology of these expanded photographic images that operate between image as representation and active interaction, and by examining the implications of this for embodied and temporal relations with photography.

[5] Video excerpt of the *Durational Objects* work is available here : https://aronspall.co.uk/Archive

Figure 2. *Durational Objects, 2023*

Within the imaging capture methods that I have developed is a mapping of durational time into singular 3D objects. This differs from photography and video processes in important

ways. In the reception phase, for example, the viewer's engagement is neither instantaneous as in photographs, nor fixed in duration, as in video, but instead unfolds as an interactive and malleable temporal experience.

The first durational change is in the capture process itself. Whereas a 'point and shoot' photograph is taken from a fixed perspective in one click of a shutter, the scanning process requires movement over time from the apparatus to allow for images and depth data coordinates to be captured from multiple perspectives. The 3D object then, is comprised of multiple perspectives and a short duration of time (typically 2 to 20 seconds) that are stitched together, as seamlessly as the computational processing will allow, to present a single scene at a single moment in time. This paradox became central to the work. The images appear as singular objects, yet each is composed of multiple durations.

The second form of durational change takes place during viewing, which is now dependent on physical movement around the 3D scene in order for all components of the image to become visible. The image is not given all at once but unfolds through embodied navigation. In this way, duration is not only embedded in the making of the image but is reactivated through the embodied encounter with it.

I describe these works as *Durational Objects*. The example shown here (see Figure 2) is a 3D image of my movement, with the camera sensor, through a space which also captures the movement of the figure (my son) through the space. These durational objects stretch the temporal assumptions embedded within photography's cultural memory yet still act as examples of 'seeing photographically' (Frosh, 2024, Toister 2024). They carry echoes of the chronophotographic studies of Jules-Étienne Marey (1891), while extending them into spatial movement and interaction. They raise questions about whether time in such images can still be understood as a succession of discrete moments. If the image is composed through accumulated perspectives over time, and if its reception depends on movement unfolding over time, then photographic temporality here operates as multiple active durations rather than a captured instant.

These conditions suggest the need to rethink photography's relationship to time. Traditional thinking around photography is grounded in a linear model of temporality, in which images are understood as capturing discrete moments that can be ordered sequentially; The photograph as a frozen instant, a slice of time preserved for future viewing. However, such a model becomes difficult to sustain in the context of imaging practices that unfold through interaction, duration, and repetition.

These images resonate with philosophical accounts of time developed by Henri Bergson and later Gilles Deleuze. I am interested in how these types of images can be framed in relation to Bergson's notion of duration (*durée)*; that we experience time not as divisible static moments but as a condition of pure change that acts to prolong the past into the present as memory (2005). For Bergson, lived time is composed of qualitative multiplicities in which past and present coexist within a continuous flow. Within this non-chronological and non-linear model of temporality, memory is central: 'the past [is] no longer to be conceived as a dead repository of events… Not only does the past coexist with the present in Bergson and Deleuze's view of time, but memory is created along with the present…' (Al-Saji, 2004, p. 229). It is memory which links pastness with the virtual dimension of the present through an interplay between what has been and what could be.

Deleuze extends this through his concept of repetition as difference (2018). Rather than simply reproducing the same, repetition generates variation, producing new temporal configurations with each iteration. Expanded forms of photography have, as Rubenstein points out, 'the ability to picture time not as a progression of homogenised measured units but as non-chronological, inhuman, singular time, as the expressive potential of difference.' (2023, p. 15). In *Durational Objects*, this becomes particularly evident in the encounter with the image. Because these works are activated through bodily movement each encounter produces variation. Shifts in perspective, proximity, scale and orientation generate different temporal experiences with each iteration. This condition can be understood as *durational multiplicity*. Rather than containing a single temporal moment, these image forms bring together multiple durations, including the duration of capture, the duration of computational processing, the duration of embodied navigation, and the duration of remembered experience. What appears as a singular image is therefore composed through the coexistence of multiple temporal processes.

These philosophical perspectives enable photography to be understood as temporal events rather than fixed captures. In the context of expanded imaging technologies such as augmented reality and 3D imaging, this shift becomes particularly significant. Images are no longer encountered instantaneously but unfold through embodied interaction, generating multiple, overlapping temporalities that further disrupt linear conceptions of time.

Spaces Between

The third body of work shifts attention from duration within the image to the temporal dissonance that emerges when archival photographs are re-situated within present environments through augmented reality. Whereas *Durational Objects* explored how expanded photographic images produce duration through capture and embodied encounter, *Spaces Between*[6] (See Figure 3) examines what happens when remembered spaces return as digital overlays within the present. The work brings different temporalities into direct relation, generating encounters in which past and present occupy the same space simultaneously.

[6] Video excerpts of the *Spaces Between* work is available here : https://aronspall.co.uk/Archive

Figure 3. *Spaces Between: Madrid in the Woods, 2024*

In this phase, I adapt Annette Kuhn's memory work into 3D space, asking how performances of memory shift when images can be navigated at human scale and situated within contemporary environments. Kuhn's method begins with close attention to a single image and

expands outward through narration and collaborative interpretation toward broader social, historical, and cultural meanings (2010). Central to this approach is the understanding that vernacular photographs function as prompts for storytelling, opening onto layered and often incomplete processes of interpretation. Memory arises not from the image alone, but through ongoing acts of use, narration, and reinterpretation.

What interests me is how this process changes when the image is encountered as a navigable image space embedded within a present-tense environment. Whilst Kuhn's performative viewings involve narrating memory around a photograph, these experiments ask what happens when memory is performed within the image itself. In *Spaces Between*, archival images return within contemporary environments through augmented reality, bringing past and present into direct relation. The resulting encounters often generate a productive disorientation, unsettling distinctions between past and present while opening new ways of engaging with memory.

I use autoethnographic writing to record my responses to the augmented reality environments from the moment the scene appears. The following is an excerpt from one such encounter:

> "There is a definite strangeness to this frozen scene. The overlaying of scenes is disconcerting, the emotional resonances from that time are uncomfortable, it feels in some ways too close. There is something jarring about it, a sense of the past ripped into the present. The jagged edges of a chair that is only partially scanned feel like a metaphor for this disruption of time and space.
>
> I'm able to move in and around the scene in an almost forensic way. One of the garden chairs has partially folded and as I go close I notice there are sandals and a hoodie inside. These are details I paid no attention to in my experience at the time… The Spanish grass is bright green and yet seems to fit very naturally into the present day scene... It seems like a shadow in 2022 somehow being cast by a tree from the present day."
>
> (*excerpt from Madrid in the Woods*, 2024)

What emerges here is a form of temporal rupture. The augmented reality overlay places different temporalities into direct relation, creating encounters in which the past appears within the spatial and perceptual conditions of the present. The image functions simultaneously as a trace of an earlier event and as a present-tense environment that can be entered, navigated, and inhabited. This instability becomes more pronounced in subsequent encounters:

> "It is 6pm, late April 2025. I am on the moors above Beeley in Derbyshire, a favourite walking area for me and my dog, Star. I open an augmented reality (AR) scene containing 3D images captured 3 years previously on a summer visit to friends. It is a very busy image, filled with fragments and shards, edges of people and objects. My approach to making these scenes had been to scan quickly, for the capture process to resemble other everyday forms of photographic capture. As a result the image scenes are full of distortions and 'errors' where the mesh of points and photographic textures misalign or become detached. The resulting shapes hang and hover, creating a tangled, messy scene that discourages verisimilitude. It makes the presence of the machinic, computational processes impossible to ignore, they pull at my attention.

> As I move through this disjointed scene of floating shapes and blurred movements, I find legibility in the form of my dog lying under a bench shading from the hot sun. The experience at this point suddenly becomes stranger as Star (in present tense Beeley) enters the scene and lays down in the same position as her past self. She has no way of seeing what I am seeing via the phone screen, and yet she starts to dig in the exact position where her photogrammetry scanned self lies in augmented reality. I think how bizarre it is to see this serendipitous performance of the expression 'digging up the past'. She lays down again and the past and the present flicker."
>
> (Excerpt from *Margate in Beeley*, 2025)

Encounters such as this reveal why autoethnographic observation are an important part of this research process. The significance of the moment lies in the relations that emerge between image, place, software, environment, and embodied experience. Star's actions were neither anticipated nor designed into the work, yet they intensified the overlap of different temporal registers and made perceptible the instability already present within the image environment. Experiences of this kind played an important role in shaping the concepts developed throughout the chapter, drawing attention to forms of remembering that emerged through interaction with the work itself.

I describe this condition as temporal dissonance. Temporal rupture captures the immediate experience of temporal instability; temporal dissonance provides a way of understanding how different temporal registers are brought into friction within the encounter. Unlike durational multiplicity, which concerns the coexistence of multiple temporal processes within the image, temporal dissonance refers to situations in which those temporalities become perceptually entangled. Past and present become hard to distinguish, they are experienced simultaneously, making temporal boundaries difficult to hold in place. Remembering, as situated through these encounters, is therefore shaped not only by images of past events but through the computational conditions in which the image appears.

This has implications for how Kuhn's memory work can be extended. While her approach focuses on narration and performative viewing, the expanded photographic images I am working with introduce different conditions for remembering. Interpretation unfolds through interaction with a computational image that shifts through use and navigation. Remembering becomes entangled with these processes, shaped by the ways in which the image appears and responds. Kuhn's insights remain important in understanding how images condense personal experience while revealing absences and silences. In this work, those absences are encountered spatially through distortions, missing data, and other interruptions that become part of the experience of remembering.

The computational conditions through which these encounters occur are central to this shift. Hoelzl and Marie's concept of *The Photographic Now* (2015) provides a useful way of understanding why these image environments generate temporal instability. In distinguishing between sign and signal they describe a 'new kind of representation that is no image, no sign, only the optical illusion caused by the display of a continuous signal' (p. 58). This distinction helps account for the continual processing inherent in contemporary images. What appears as an image is better understood as an effect of ongoing computation than as a stable representation. Within this framework we can think of the experience of images within *Spaces Between* as generative, the images acting as signals unfolding through durational and

spatial interaction rather than as fixed representation. This helps account for the sense of temporal instability in these encounters as it is closely tied to the operative conditions of the image system itself.

Lev Manovich's influential attempts to identify gaps in the language of new media in the 1990s is still useful in this context: 'It is only by habit that we still refer to what we see on the real-time screen as images. It is only because the scanning is fast enough and because, sometimes, the referent remains static, that we see what looks like a static image' (2001, p. 95). If we update and apply this analysis to these augmented reality encounters, we can see the literal breaking down of this illusion. As the image is recalculated in relation to the viewer, device, and surrounding environment, it produces a form that is in a state of continual transformation. The temporal disorientation that punctures these works can therefore be understood as arising through the interaction between memory and the real-time processing of images.

Historically, terms such as 'post-production' and 'visual effects' belonged to an analogue context in which images were first captured, then processed, and only subsequently altered. Editing reshaped temporality through cuts, sequencing, and duration, while manipulation adjusted aesthetic properties such as colour, contrast, framing, layering, and compositing. In this model, there was a clear temporal gap between the production of an 'original' image and its later modification.

In sensographic imaging, this separation becomes less distinct. The image is composed through coded translations of data, shaped by software and algorithmic processes that operate at the point of capture. These processes perform functions analogous to visual effects but are activated as part of the image's formation rather than after it. As a result, the image remains open to continual modification, able to be shared, updated, transformed, and reprocessed. Its condition is one of ongoing transformation.

The temporal instability described above also helps explain the hauntological qualities of these works. Derrida's concept of hauntology (1994) provides a way of understanding how traces of the past persist within the present without ever becoming fully recoverable. Augmented reality overlays bring fragments of earlier image environments into contemporary spaces, creating encounters in which different temporalities become perceptually entangled. The past does not disappear, yet neither is it restored intact. Instead, it persists as a partial presence that intermittently intrudes upon the present.

Fisher's discussion of temporal disjunction (2012) extends this understanding by drawing attention to the unsettling effects produced when different temporal registers occupy the same experiential space. The partially scanned chair, the shadow cast across two times at once, and the moment in which Star encounters her earlier scanned self[7] all reveal how past and present can be experienced simultaneously while remaining distinct. These encounters generate a sense of temporal interference in which multiple histories remain active within the present.

Durational Objects explored how expanded photographic images participate in the production of time through duration. *Spaces Between* extends this inquiry by examining what happens when different temporalities are brought into direct relation within the same spatial

[7] See video excerpts here: https://aronspall.co.uk/Archive

encounter. The resulting instability reveals remembering as a process of continual negotiation between past and present.

Machine sensing agency

Throughout these projects, memory emerges through interactions with image systems that contribute to how images appear, behave, and are experienced. This raises questions about the role of machine sensing within acts of remembering and the extent to which computational systems participate in the production of memory. Within LiDAR scanning, photogrammetry, and augmented reality, the image is continually subjected to processes of interpretation. Software predicts surfaces, reconstructs missing information, estimates spatial relationships, and generates coherent image environments from incomplete datasets. The machine is not standing back, acting as an objective witness, it is an active participant in the production of the image world through which remembering takes place.

This participation becomes particularly visible in moments of failure. Glitches, distortions, missing surfaces, and unstable alignments expose computational operations that would otherwise remain hidden. Rather than functioning as technical deficiencies, these interruptions reveal the active role of sensing systems in shaping photographic experience. They make perceptible the continual negotiation taking place between human perception and computational processes.

The significance of these operations lies not simply in their resemblance to memory but in their participation within it. The sensing systems employed throughout this research do more than capture information about environments. Through prediction, interpolation, reconstruction, and continual recalculation they shape the conditions through which memory is encountered. Remembering emerges through these interactions, becoming inseparable from the technical operations that make the image available in the first place.

From this perspective, the sensographic encounter reveals remembering as a process that extends beyond the individual subject. Memory takes shape through relations between human recollection, embodied movement, and machine sensing. The image is no longer simply a representation of memory or a prompt for its recall. It becomes an active participant in the production of memory itself.

This shift has implications for how photography is understood within memory studies. Throughout this chapter I have argued that expanded photographic images are not simply new forms of representation but environments within which remembering is enacted. The concepts of mnemonic assemblage, durational multiplicity, and temporal dissonance each describe different aspects of this condition. Together they suggest that memory is increasingly shaped through encounters with computational image systems that sense, calculate, reconstruct, and respond.

The sensographic encounter provides a way of understanding these developments. Building on Zylinska's account of sensography while extending it into the domain of memory, the concept draws attention to the ways in which machine sensing, embodied experience, and acts of remembering become entangled within expanded photographic environments.

Memory takes shape through encounters that are relational, situated, and continually in formation.

Conclusion

The emphasis on encounter is important. Existing accounts of computational photography frequently focus on technological systems, image ontologies, or machine perception. This chapter has instead been concerned with what occurs when such systems are inhabited, navigated, and experienced through the body. The sensographic encounter arose from this concern as a way of understanding how remembering takes place within expanded photographic environments.

Walking through an augmented reality scene, encountering fragments of a family archive reconstructed through photogrammetry, or finding unexpected correspondences between past and present all revealed remembering as an event rather than an object. Memory appeared through interaction. It was constituted through the relations established between bodies, images, and computational systems.

The concept of the sensographic encounter is grounded in such experiences. Building on recent discussions of photography as sensing, it extends those debates into the domain of memory by focusing on situations in which machine sensing, embodied experience, and remembering become entangled. Significantly, it is often through moments of interruption that these relations become most visible. Glitches, distortions, fragmented scans, and unstable overlays expose the processes that ordinarily remain hidden, drawing attention to the ways images are continually assembled and reconstructed. In this sense, the imperfections of expanded photographic systems are not simply technical shortcomings. They reveal something fundamental about remembering itself. Like memory, these image environments remain partial, contingent, and unfinished.

Throughout the works discussed here, it is often within the gaps, interruptions, and frictions of the image that memory becomes most perceptible. The sensographic encounter reveals an experience of memory that is neither fixed nor complete, but relational. As imaging technologies increasingly strive towards seamless reconstruction and synthetic completion, there may be value in preserving attention to these moments of uncertainty.

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