

Literature review: virtual museum of protest art as empathy machine

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Abstract

Purpose – This study offers an integrative narrative review of interdisciplinary scholarship on protest art, digital circulation, surveillance, memory and immersive media. It aims to examine how memories of protest endure beyond moments of collective assembly and develops a conceptual framework for understanding virtual museums of protest art as counter-archival empathy machines.

Design/methodology/approach – The study adopts an integrative narrative review to synthesise scholarship across media studies, visual culture, affect theory, archival and counter-archive studies, urban and spatial studies, surveillance studies, and human–computer interaction.

Findings – The review shows that such memory is sustained by remediated artworks, affective circulation across digital platforms, spatial traces embedded within urban environments, and data generated through surveillance regimes. It suggests that empathic engagement in virtual reality (VR) environments emerges through embodied participation and interpretive engagement rather than immersion alone. Synthesising recent scholarship on virtual museums and digital heritage, the article conceptualises the VR protest art museum as a counter-archival empathy machine through which these memories are encountered and reinterpreted within immersive environments.

Research limitations/implications – The study is conceptual and does not present an implemented VR system. It identifies immersive protest archives as an area requiring further empirical and practice-based research.

Originality/value – The study integrates counter-archival theory, affective media studies and immersive interaction design to explain how protest histories may be experienced through participatory, embodied and interpretive forms of engagement.

Keywords Protest art, Counter-archives, Affective publics, Empathy machine, Virtual museums, Immersive media

Paper type Literature review

1. Introduction

One of the most profound visual metaphors of the anti-Citizenship Amendment Act protests in India's capital New Delhi in 2020 was a sketch inspired by a photograph of a woman protester raising a finger to a policeman who was beating up another male protester (Dutta, 2019). The artist, Ponvannan, who lived 2000 kms away from the site of the event called his creation, “Oru Viral Puratchi” (one-finger revolution) (Rao, 2019). The artist's sketch, created within 24 h, was inspired by the viral photographs and video footage of the moment but ended up outliving all of them. The sketch went viral overnight across social media, even becoming a screensaver for users who were unable to participate directly in the protests but were nonetheless drawn to its visual power. Its afterlife reveals how protest art can transcend



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the temporal and spatial limits of protest, transforming a fleeting event into an enduring affective symbol. This sketch was one of several such images repurposed from live and often viral, real-life events on social media and news coverage. Each of these artistic representations is reappropriated through the artist's own imagination, through colours, text, posture, glance and appearances. In their intertextuality, these artistic impressions of live events also offered avenues for diversity of interpretations, thoughts, expressions and discursive narratives that shaped the very nature of anti-Citizenship Amendment Act (Anti-CAA) protests. Visual culture has been enacted by repetition of images as a series of 'compressed performances' (Pinney, 2004) which is now frequently played out through social media (Rose, 2014). The evolution of digital technology and social media in the last decade has brought news and art closer than ever before. These images played a crucial role in shaping how dissent was sensed and remembered, exceeding their evidentiary value.

Protest leaves residues in the material city, from faded slogans and erased graffiti to data traces generated by surveillance regimes. As urban scholars have argued, infrastructures "remember" because histories of power and conflict remain in the everyday material residues of urban life (Amin and Thrift, 2017; Basu, 2026). This foregrounds a central tension in contemporary protest cultures, where memory is produced not only through counter-archives and vernacular media, but also through the infrastructures of monitoring and erasure that movements contest. This article offers an integrative narrative review of literature that synthesises interdisciplinary scholarship on protest art, memory and immersive media, that reconstructs protest as a counter-archival empathy machine.

The article draws on media studies, visual culture, affect theory, spatial and urban studies, archival scholarship and human-computer interaction to examine how protest art, memory and immersive media intersect. It engages debates on remediation, affective publics, spatial residues, surveillance and virtual reality (VR) museum practice, arguing that while protest imagery, digital circulation and counter-archives are well established fields, their relation to immersive media, memory-making, embodied engagement and user agency remains underexplored. Virtual museums are widely discussed in digital heritage, but their application to politically sensitive and ephemeral materials such as protest art remains contested.

Bringing these strands together, the paper develops a conceptual synthesis of the virtual museum of protest art as a counter-archival empathy machine grounded in interaction, embodiment and interpretive agency. Informed by an ongoing VR museum project, the review establishes a broader critical framework for understanding immersive environments as sites of protest memory and counter-archival practice, clarifying their scope, components and interactional logic within debates on digital heritage, urban memory and immersive media.

2. Methodology: Integrative narrative review

This article adopts an integrative narrative review to synthesise interdisciplinary research on protest art, digital circulation, surveillance, memory and immersive media. Because this scholarship is dispersed across media studies, visual culture, affect theory, archival and counter-archive studies, memory studies, urban and spatial research and human-computer interaction, an integrative approach is appropriate for clarifying concepts and synthesising theoretical debates rather than systematically comparing findings (Torraco, 2005). This method is especially suited to emerging cross-disciplinary fields, enabling diverse perspectives, concepts and tensions to be examined in relation to one another.

Literature was selected for its relevance to protest art and remediation, affective circulation, immersive media, embodied witnessing, memory and counter-memory, spatial

traces of protest and political imagination. Sources were identified through Scopus, Web of Science, JSTOR, Google Scholar and the ACM Digital Library using targeted keywords. Inclusion was guided by substantive engagement with one or more of five domains: protest art and visual culture; digital circulation and affective publics; surveillance, spatial media and vertical visibility; immersive technologies, including VR; and archival or counter-archival practices. Priority was given to works addressing the relationship between media, memory and political expression, while sources were excluded where these themes were only peripheral or did not engage questions of memory, visibility or embodied experience.

Analysis proceeded through thematic clustering and cross-field synthesis, organising the material around key conceptual strands and identifying convergences, gaps and tensions in the literature. The review also incorporates selected arts-based and practice-led materials, including experimental media projects and artistic practices using surveillance footage, satellite imagery and immersive technologies. These works were included for their critical engagement with visibility, memory, spatial mediation, protest documentation and embodied interaction, particularly where they function as conceptual interventions rather than aesthetic or technical demonstrations. This inclusion recognises artistic research as a mode of knowledge production capable of generating theoretical, affective and experiential insights beyond conventional academic writing (Borgdorff, 2012). As with all narrative reviews, the approach is shaped by interpretive judgement and is therefore subject to selection bias (Borgdorff, 2012; Greenhalgh, *et al.*, 2018). Although interdisciplinary perspectives were prioritised, the review does not claim exhaustive coverage, and non-English scholarship and rapidly evolving technical implementations of immersive media may be underrepresented. These limitations indicate areas for further empirical and systematic investigation, particularly at the intersection of immersive media, participatory archives and politically sensitive cultural materials.

3. Aesthetics, remediation, affective circulation and embodied experience

Protest art has long made dissent visible, a function reshaped by the speed, aesthetic affordances and participatory dynamics of networked media. This section examines how protest imagery operates politically across digital environments, foregrounding its capacity to carry affect, memory and embodied resonance beyond the moment of collective assembly.

3.1 *The aesthetics of protest in the digital era*

Contemporary protest movements are shaped by a pervasive visual regime in which political life is increasingly mediated through images (Mirzoeff, 2011; Cubitt, 2014; Debord, 2021). Protest images and videos circulating across social media have become central to how movements are documented and remembered. Azoulay's account of the civil contract of photography understands photographs as mediating ethical and political relations between image-makers, photographed subjects and spectators (Azoulay, 2024). In digital protest cultures, this civic relation is extended through smartphone capture and platform circulation, as images move rapidly across networked publics, accrue affective force, and help anchor political narratives. Certain protest images may therefore become civic icons, condensing collective identity and political struggle into widely recognisable visual forms (Hariman and Lucaites, 2007). Similarly, Sontag (2003) and Butler (2016) note that images of violence and resistance shape ethical and political imaginaries by rendering suffering, solidarity and courage visible. For Mirzoeff (2011), visibility in digital culture also opens space for counter-visual practices through which dominant narratives are contested and alternative modes of seeing are asserted.

Alongside, protest art has remained a powerful vessel for activism, continually shaping sociopolitical discourse. This lineage stretches from early formulations such as Richard Wagner (1849) *Art and Revolution* to the radical experimentation of early 20th century avant-gardes. Movements like Dadaism, Futurism and Surrealism developed new visual languages, where absurdity and abstraction serve as critiques of war, capitalism and bourgeois aesthetics. These movements introduced symbolic codes that later informed activist art practices. Figures like Hugo Ball, Man Ray and Marcel Duchamp subverted traditional art through absurd, provocative critiques of a war-torn society, as “anti-art” (Art Madrid, 2020), paved the way for later developments in conceptual art. In the late twentieth century, groups such as the *Guerrilla Girls* used humour, evidence and bold graphic design to expose systemic inequalities in cultural institutions [1]. The emergence of activism, the convergence of art and activism, accelerated during global justice movements such as the 1999 WTO protests and the rise of Indymedia. After the 2008 financial crisis, movements including Spain’s 15M and Occupy Wall Street expanded these practices, using social media and grassroots organisation to occupy both physical and digital spaces (Castells, 2015). While substantial scholarship examines protest organisation and media infrastructures, less is known about how protesters mobilise visual culture through images and artworks across interconnected physical and virtual domains. Remediation is central to this process, as protest images are reworked across platforms, formats and publics, acquiring new political meanings as they circulate.

3.2 Remediation as political practice

Contemporary protest art inherits many qualities from the traditional lineage but operates within a mediated environment shaped by rapid circulation and convergent digital aesthetics. Like the Dadaists’ use of found objects, remediation recontextualizes borrowed elements to challenge original meanings and invites new interpretations. Bolter and Grusin (1996) describe how media refashion and absorb one another through immediacy and hypermediacy. Protest imagery exemplifies this dual logic by conveying the urgency of lived experience while circulating through overtly mediated, platformed environments.

Remediation can also be understood as a form of remix culture through which media elements are reworked and contested (Navas, 2014). In protest contexts, this process is political because it shapes how events are perceived, archived and then remembered. Artists appropriate visual materials, transforming them through colour, composition, text and gesture to generate pluralised perspectives and alternative narratives. In doing so, remediated protest artworks loosen images from logics of fixity and singular meaning, allowing them to function as mobile symbols of resistance.

This review understands such works as cultural forms, less as stable representations than as evolving embodiments of collective sentiment shaped by social experience and political struggle (Scott and Tomaselli, 2018). Through repeated circulation, these artworks accrue meaning over time, operating as sites where political memory and identification are continually negotiated. As Phillips and Milner (2017) note, remediated images circulate through digital networks as densely knotted forms whose meanings emerge through participatory repetition. In this sense, remediation constitutes a generative political practice through which protest imagery remains open to contestations.

3.3 Affective circulation in digital platforms

As remediation reshapes the symbolic life of protest imagery, affective circulation determines its political reach across platforms. Digital media environments facilitate affective publics which means networked formations that emerge through shared feeling and

participation (Papacharissi, 2015). Protest images often generate strong emotional attachments enabling dispersed individuals to form collective attachments through shared visual and emotional vocabularies. The processes contributed to humanitarian spectatorship, as Chouliaraki (2013) describes. As Nikunen (2019) argues, mediated solidarity is a sense of belonging produced through affective engagement rather than physical co-presence. The public sharing of images and their reactions operate as a collective affective practice reflecting and shaping moral values, including ideas of how to engage with others and how to direct a sense of solidarity (Nikunen, 2019). The circulation of protest imagery is also shaped by platform algorithms that amplify content likely to provoke strong emotional responses, privileging images that are visually forceful or emotionally charged (Bucher, 2018). As Gillespie (2014) argues, algorithmic systems act as gatekeepers of public visibility, shaping which images gain traction and which recede from view. Affective intensities and algorithmic logics thus interact to structure the symbolic life of protest art and influence the narratives that coalesce around social movements.

Drawing on Massumi's (2002) theory of affective intensity and Ahmed's (2013) concept of affective economies, this literature suggests that affect is central to digital circulation. Through repetition and sharing, protest images accumulate emotional charge, functioning as affective infrastructures that bind publics together and orient political expression. Here, affective infrastructures are understood as the networked systems through which emotions circulate, accumulate and organise collective experience across media environments (Ahmed, 2013; Papacharissi, 2015). These images operate as sites where political emotion and collective identification take shape.

3.4 *Embodied and corporeal aesthetics*

Although protest images circulate widely through digital infrastructures, their political force remains grounded in embodied experience. Affective approaches to visual culture emphasise that images are encountered corporeally as well as cognitively. Scholars working at the intersection of media theory and phenomenology have foregrounded the role of the body in shaping how images are perceived and felt. Hansen (2004), for instance, argues that digital images acquire meaning through affective and proprioceptive engagement, positioning the body as an active framer of visual experience. Similarly, Marks (2000) and Thrift (2008) emphasise the material and sensory dimensions of media encounters, drawing attention to how images generate felt intensities that shape attention and identification.

Within protest contexts, these embodied dimensions are particularly significant. Remediated artworks may diverge visually from their source images while retaining core affective orientations such as gestures of defiance or solidarity that register at a bodily level. As images circulate, their affective charge mutates and transfers intensities across contexts and encounters (Massumi, 2002). Protest imagery thus engages viewers through embodied resonance as much as through representational meaning. This corporeal dimension points towards the relevance of immersive environments such as VR. If protest images already mobilise sensory and affective engagement within two-dimensional media, immersive technologies provide a framework for considering how embodied perception, presence and affect might be reconfigured within navigable environments. The corporeal aesthetics of protest art enact political events by drawing viewers into affective encounters grounded in proximity and sensation. This perspective provides a conceptual bridge to later discussions of immersive media, where embodiment and interaction become central to how protest memory and empathy are configured.

4. Drone imagery, aerial view and surveillance

The previous section showed how protest imagery circulates through affective intensity and embodied engagement. This section turns to regimes of vision that shape what becomes politically visible. Contemporary surveillance infrastructures reorganise visibility through vertical and computational observation, altering how protest is seen and remembered while also creating openings for counter-visual practice.

Drones, satellites and geospatial systems introduce asymmetries of vision through which military, state and corporate actors make protest visible and governable. These vertical regimes reconfigure how space, bodies and political action are perceived and managed, while artists, activists and communities appropriate aerial vision as tactical media to disrupt dominant ways of seeing. Embodied aesthetics also operate within vertical vision, as aerial images reveal collective action perceptible through spatial patterns and material traces. This section argues that drone imagery enables a form of distributed corporeality, understood as the perception of collective bodies through spatial and infrastructural inscriptions rather than individual physical presence (Parks, 2018; Massumi, 2002). From this perspective, protest appears as an affective and material field inscribed into the urban fabric beyond the moment of assembly.

4.1 Horizontality to verticality: the gaze from above

In the post-9/11 context, security discourses associated with the “war on terror” have intensified surveillance of everyday life, particularly targeting marginalised communities (Lyon, 2003; Graham, 2011). This securitisation has extended far beyond warzones, restructuring urban environments into stratified zones of observation and control. Scholars describe this transformation as the emergence of a surveillance society in which state and corporate actors govern populations through increasingly datafied and spatialised forms of governance (Lyon, 2001). The expansion of urban life into vertical dimensions has fundamentally reshaped the politics of visibility. Geospatial imaging, satellite vision, drones and platform-based mapping technologies construct a visual regime in which space is rendered volumetrically, enabling new modes of control and intervention (Parks, 2018).

Power and wealth increasingly concentrate in vertical infrastructures through skyscrapers, elevated transport systems, surveillance towers redefining class relations and deepening socio-economic inequalities (Lefebvre, 1991; Harvey, 2000; Sassen, 2004; Soja, 2011). These infrastructures actively produce spatial knowledge, shaping how territory, populations and conflict are visualised and governed within what Crampton (2010) describes as surveillant assemblage. Aerial vision has long played a central role in this politics of visibility. Early aerial photography during the First and Second World Wars established what scholars term the vertical gaze: a “god’s-eye view” that transforms territory into legible space for command and administration (Adey, 2010; Cosgrove and Fox, 2010). The view from above converts vision into authority. Contemporary drones extend this lineage, embedding aerial vision within everyday infrastructures of policing, crowd monitoring and urban management (Gregory, 2011; Chamayou, 2015).

Scholars of surveillance and visibility also note that aerial perspectives do not entirely efface embodiment. Drawing on affect theory (Massumi, 2002; Anderson, 2009), and spatial theories (Parks, 2018; Weizman, 2024), this literature suggests that vertical images register collective action through spatial pattern rather than individuated bodies. Aerial vision translates gesture into pattern, movement into inscription, and affect into infrastructural memory. From this perspective, drone imagery produces a form of distributed corporeality in which protest is encountered as an affective force inscribed into space. These residues what

[Stoler \(2009\)](#) describes as the persistence of imperial debris, continue to circulate politically and affectively, shaping urban rhythms and collective imagination ([Ahmed, 2013](#)).

4.2 Tactical media, counter-visibility and artistic resistance

Surveillance technologies also reshape experiences of spatial relations. Aerial and virtual views collapse spatial boundaries, producing forms of relational closeness to distant sites while enabling navigation across layered temporalities ([Adey, 2010](#); [Graham, 2011](#); [Klauser, 2013](#)). Digital mapping interfaces, such as navigational platforms, function as temporal archives through which users can traverse past and present landscapes, reasserting forms of agency over memory and spatial experience ([Gurevitch, 2014](#); [Hoskins, 2018](#)). Artistic interventions have similarly exploited scale and visibility such as Raúl Zurita's inscriptions in Atacama Desert, "Ni Pena Ni Miedo" meaning No Pain Nor Fear ([Borzutzky, 2022](#)) to generate collective affect and ethical engagement through aerial legibility.

As aerial surveillance becomes increasingly normalised, artists and activists intervene by appropriating drones, satellite imagery and mapping tools as forms of tactical media ([Raley, 2009](#)). Tactical media operates within and against dominant infrastructures, exposing their logics while redirecting their capacities towards critique and resistance. These practices align with what [Mirzoeff \(2011\)](#) defines as counter-visibility: an insurgent right to look that contests the invisibilities imposed by militarised and colonial vision. Counter-visual strategies become particularly urgent in the context of what [Farocki \(2004\)](#) describes as operational images, images produced by machines for machine vision, circulating without human spectatorship. Artistic and activist interventions render these operations visible, disrupting the asymmetry between those who watch and those who are watched. Scholarship distinguishes among practices such as sousveillance, counter-surveillance and participatory surveillance ([Mann, 2004](#); [Monahan, 2006](#); [Albrechtslund, 2008](#)), all of which reconfigure who observes, for what purpose, and with what political effects.

Artists and collectives including ([Steyerl, 2013](#)), [Paglen Studio \(2026\)](#), Ai Weiwei, Forensic Architecture and OpenAerialMap use aerial imagery and spatial data to expose state violence, reconstruct erased histories, and contest dominant narratives [2] ([Paglen Studio, 2026](#)). These practices reconfigure embodiment as spatial inscription, making corporeality visible through pattern and residue.

Methodologically, this body of work informs the use of drones and walkthrough cameras to capture both aerial and street-level footage, repurposing technologies commonly associated with surveillance and state monitoring. By reversing their gaze, these apparatuses function as counter-visual tools that make visible the spatial residues through which protest continues to register beyond the moment of assembly. Within the VR environment, these traces operate as counter-archives becoming sites of encounter that invite users to navigate unfinished narratives of dissent. The virtual museum sustains attention to what remains incomplete, foregrounding interaction and interpretation as conditions through which empathic engagement can emerge.

5. Counter archives, memory and spatial afterlives

The preceding discussion examined how surveillance and aerial vision reorganise the visibility of protest, translating collective action into spatial and datafied traces. These processes raise questions about how such traces persist and are remembered over time. If regimes of vision structure what can be seen, archival practices shape what is preserved or erased. This section turns to counter-archives and memory practices to examine how protest is sustained through spatial and affective afterlives beyond the moment of visibility.

Protest events generate forms of memory that persist long after collective gatherings disperse. These afterlives include remediated artworks, urban residues and data traces produced through surveillance infrastructures. Such memory remains in tension with state-led practices of governance and archival control, which seek to manage how dissent is recorded and remembered. Protest artefacts and urban traces operate as counter-archives that challenge official narratives and sustain memory beyond the moment of assembly. Archives and visual records are shaped by political and institutional regimes that determine historical visibility. Counter-archival practices preserve marginalised materials while reinterpreting and reactivating images and artefacts against dominant historical frameworks (Azoulay, 2019).

5.1 Counter archives

Archiving has traditionally been associated with state institutions, museums and formal repositories that organise historical material through classificatory systems and bureaucratic logics. As Stoler (2002) and others have argued such archives are technologies of rule that structure what becomes knowable, legitimate and historically visible. Colonial and state archives have routinely excluded marginalised communities, producing forms of epistemic violence and institutional amnesia (Trouillot, 1995; Mbembe, 2002; Stoler, 2008). In response, counter-archival practices emerge outside institutional frameworks to preserve memory, contest dominant epistemologies, and challenge authoritative histories (Stoler, 2002; Caswell and Cifor, 2016; Azoulay, 2019). Protest art frequently enters public memory through such counter-archival pathways. Posters, murals, placards, street installations, improvised monuments and graffiti operate as vernacular archives (McKee, 2016), encoding collective feeling through situated aesthetic practices. Circulating across physical sites and digital platforms, these artefacts destabilise boundaries between archive and event, record and performance. They become living archives whose meanings are continually reactivated and reinterpreted.

Contemporary archival landscapes are increasingly datified and algorithmic. Surveillance infrastructures generate shadow archives of location data, images and biometric information that are used to monitor populations and pre-empt dissent (Monahan, 2010, 2015). These archives often operate without transparency or consent, reinforcing racialised and classed hierarchies of suspicion. Protest artefacts therefore occupy a paradoxical position, remaining vulnerable to erasure and policing while persisting through personal archives, community repositories, activist platforms and remediated circulation. In doing so, they form distributed counter-archives that exceed any single institution. Their political force lies in their partiality, fragility and refusal of a singular authoritative voice.

Community archives and participatory memory practices extend counter-archiving by foregrounding collective authorship, situated knowledge and community involvement in shaping how histories are recorded and shared. This body of work conceptualises archives as dynamic, collaborative processes in which memory is produced through contribution and reinterpretation (Flinn, 2007; Caswell and Cifor, 2016; Caswell, Cifor and Ramirez, 2016). Participatory archives enable individuals and communities to contribute not only materials but also annotations, and narratives, decentralising authority and allowing multiple perspectives to coexist.

In protest contexts, such approaches support the preservation of ephemeral and contested forms of expression that formal archives often exclude. Materials used in the creation of the VR Museum draw partly on contributions from individuals who participated in protest events and documented them through personal recordings, alongside visual and textual artefacts circulating across digital platforms. Additional materials were identified through

publicly available online sources and exploratory digital methods. These materials are treated as indicative examples rather than a systematic data set, reflecting broader dynamics of participatory documentation and distributed memory-making. They also foreground ethical questions of ownership, representation, access and curatorial authority in the construction of collective histories.

Artistic projects such as JR's *Inside Out Project* and Walid Raad's *The Atlas Group* function as participatory counter-archives in different ways. JR's project temporarily inscribes vernacular portraits into public space, transforming urban surfaces into sites of collective memory. Raad's *The Atlas Group* deploys fictionalised archival strategies to expose the instability and political contingency of historical evidence, challenging archival authority and revealing how histories of violence are mediated and selectively remembered. Such practices show how counter-archives operate as critical interventions into the production of history itself [3].

5.2 *Affective residues, urban banality and material afterlives*

Protest leaves behind spatial and affective traces that continue to shape public life. As [Butler \(2018, 2020\)](#) argues, the political force of protest extends beyond moments of assembly through the durational effects inscribed on space, infrastructure and social relations. Even after dispersal, the performative force of collective action persists through altered pathways, lingering affects and transformed spatial relations.

Beyond artistic artefacts, protest imprints itself onto the urban fabric through banal yet persistent traces such as faded slogans, graffiti shadows, altered surfaces and micro-adjustments to everyday routes. These become durable, often unnoticed inscriptions through which dissent continues to exert affective and political force within everyday urban life ([Amin and Thrift, 2017](#); [Simone, 2018](#)). They act as repositories of memory and collective imagination. As scholars of affect and everyday media note, memory is continually negotiated through repetition and material encounter ([Ahmed, 2013](#); [Nikunen, 2018](#); [Paasonen, 2021](#)). Urban ruins and residual spaces operate as mnemonic environments where past conflicts and social practices persist through decay and everyday interaction ([Edensor, 2005](#)).

Protest memory unfolds across circulating images, embodied habits, spatial residues and algorithmic traces that reconfigure conditions of appearance, belonging and remembrance ([Connerton, 1989](#); [Assmann, 2011](#); [Erl, 2022](#)). These traces function as affective objects ([Ahmed, 2013](#)), sustaining attachments and orienting collective political consciousness. Alongside everyday sounds, movements and interactions, they contribute to affective atmospheres that shape how space is sensed and inhabited ([Anderson, 2009](#)). Yet many such traces remain unnoticed or illegible from ground level. They become perceptible only when spatially recontextualised through aerial or vertical forms of vision. As [Graham \(2011\)](#) and [Gregory \(2011\)](#) argue, aerial imagery reveals circulation networks, infrastructural scars, erased protest sites and territorial thresholds that cannot be apprehended from horizontal perspectives alone. From above, the city emerges as a dynamic field of flows, traces and control, making the afterlives of protest spatially legible.

6. Immersive technology and empathy in affective environments

Having established how protest persists through counter-archives, spatial residues and affective memory practices, the discussion now turns to how these materials are encountered within emerging media environments. While archives preserve and circulate traces of dissent, immersive technologies enable these traces to be experienced through embodiment, interaction and spatial navigation. This section examines debates around VR as an “empathy

machine”, focusing on how immersive environments reconfigure memory, affect and user engagement.

Immersive technologies, particularly VR, have gained prominence in storytelling, education, activism and human rights advocacy. Early discourse framed VR as a medium capable of heightening emotional engagement by allowing users to experience events from another’s perspective. More recent scholarship has complicated these claims, shifting attention towards relational witnessing, affective attunement and the ethical conditions of immersive experience. Increasingly, interaction and interpretation are understood as central to the political potential of immersive environments.

6.1 *Virtual reality as empathy machine*

VR has often been described as the “ultimate empathy machine”, a claim grounded in its capacity to generate heightened sensory involvement and a sense of presence or “being there” (Constine, 2015; Milk, 2015). Studies across education and training contexts suggest that immersive environments can enhance engagement and experiential learning (Chen, 2006; Scavarelli, Arya and Teather, 2021; Lin *et al.*, 2024). In parallel, the development of multi-user and social VR platforms has expanded the scope of immersive participation, enabling shared virtual spaces for collaborative experiences (Gomes de Siqueira *et al.*, 2021; Hamilton *et al.*, 2021; Han and Bailenson, 2024).

Empathy has also been identified as a predictor of support for social equality and human rights, lending appeal to immersive media as tools for social change (McFarland and Mathews, 2005). This has prompted growing interest in multisensory and haptic interfaces designed to enhance emotional engagement, including research on touch and emotional feedback (Murer, Aslan and Tscheligi, 2013). Such work explores how sensory modalities might contribute to more compelling and meaningful immersive experiences.

At the same time, critics caution against technologically deterministic framings of empathy that overstate VR’s affective power while obscuring the situated complexities of mediated experience (Favero, 2017; Pink, 2023). Empirical research suggests that while VR can heighten short-term emotional responses, evidence for sustained behavioural change or long-term political engagement remains inconsistent and highly context-dependent (Oh *et al.*, 2016; Herrera *et al.*, 2018; Shin, 2019; Martingano *et al.*, 2021). These critiques underpin the need to move beyond presence alone and to examine how immersive environments are framed and interpreted over time.

6.2 *Interaction, counter-archival practice and multisensory engagement*

Emerging scholarship emphasises that empathy in immersive environments is a relational process shaped by interaction, context and interpretive agency. As Bailenson (2018) immersive media are not moral shortcuts; their political and ethical effects depend on how users are positioned in relation to what they encounter. While much research on VR empathy has focused on perspective-taking and presence, comparatively less attention has been paid to how interactive and counter-archival practices shape empathic engagement. In immersive environments dealing with politically charged material such as protest and dissent, interaction becomes central to how empathy is configured. This review foregrounds engagement through movement and choice. Designing against passive consumption thus emerges as both an ethical and aesthetic concern, particularly when immersive media are used to mediate political vulnerability and struggle.

Counter-archives provide a useful framework for understanding these dynamics. As discussed earlier, protest memory is often sustained through distributed, and incomplete archives that rely on circulation, reinterpretation and reuse (Flinn, 2007; Caswell, 2014). In

immersive environments, counter-archival practice can be enacted through interaction design that invites users to encounter artefacts spatially and temporally as situated traces. Participation becomes a mode of engagement rather than a separate archival category, allowing users to contribute annotations and responses that extend the affective and political life of protest memory.

Multisensory and tactile affordances further shape these encounters. Research in human–computer interaction highlights how haptic feedback and embodied interaction can support emotionally meaningful engagement (Gatti *et al.*, 2013; Schneider *et al.*, 2017; Seifi and MacLean, 2017). For immersive protest archives, such modalities function as design resources that ground memory in bodily experience. Interactive engagement slows perception, requires attention and decision-making, and encourages affective investment. In this sense, empathic engagement emerges through feeling and doing, as interpretive and expressive acts that position users as implicated witnesses.

7. Digital heritage, virtual museums and protest memory

The preceding discussion has highlighted that empathic engagement in immersive environments depends on interaction and interpretive context rather than immersion alone. These insights become particularly significant when considering how immersive media are applied within cultural and institutional settings. Virtual museums represent one such context in which these dynamics are operationalised, raising questions about curation and the politics of representation. This section situates VR museums within digital heritage scholarship and examines their potential as counter-archival environments for protest memory.

7.1 Digital heritage

The emergence of digital heritage in the late 20th and early 21st centuries marked a shift towards the large-scale digitisation of cultural collections. Early scholarship noted that digitisation expanded access beyond museum walls, enabling users to encounter artefacts through online catalogues, three-dimensional models and interactive databases (Cameron and Kenderdine, 2007; Parry, 2007). These developments increased accessibility while altering museological epistemologies through new modes of classification and interpretation.

Digital heritage scholars emphasise that online collections function as mediated cultural interfaces shaped by institutional and technical decisions (Giaccardi, 2012). Metadata, narrative framing and interface design actively shape how meaning is produced and how authority is distributed between institutions and users. For marginalised or politically sensitive material, digital heritage platforms can resist erasure and enable alternative visibility. Immersive and interactive systems further transform the museum into a performative space, where meaning emerges through embodied encounter and participation (Cameron and Kenderdine, 2007; Parry, 2013; Kenderdine, 2015).

7.2 Virtual reality museums and immersive galleries

The integration of VR into museum practice marks a further shift towards experiential and relational models of curation. Early VR museum projects focused on reconstructing inaccessible or lost sites, emphasising immersion as an educational tool (Roussou, 2002; Sylaiou *et al.*, 2010). While several VR museum projects have explored reconstruction, education and public engagement, they have largely centred on cultural heritage, art history and immersive storytelling. Platforms such as CyArk use photorealistic 3D modelling and spatial storytelling to create immersive representations of heritage sites. Major institutions including the Louvre, the Victoria and Albert Museum, and the Musée d'Orsay have developed VR experiences such as *Mona Lisa: Beyond the Glass*, *Curious Alice*, and *Van*

Gogh's Palette [4]. However, these projects primarily centre canonical art and heritage narratives, with less attention to politically sensitive or ephemeral materials such as protest art, especially in relation to participation and counter-archival practice. More recent scholarship highlights how VR affordances such as spatial presence and interactivity enable visitors to navigate environments as active participants (Economou, 2015).

Parry (2013) describes VR museums as part of a broader transformation from collection-centred institutions to relational ecosystems in which artefacts acquire meaning through spatialised storytelling and embodied navigation. Immersive galleries allow visitors to inhabit layered narratives, contested histories and atmospheric environments that would be difficult to stage in physical museums. These affordances are particularly relevant for protest art, graffiti, street installations and other ephemeral practices that resist conventional institutional display. Social and multi-user VR platforms extend these possibilities by enabling collective cultural experiences within shared virtual environments (Casaneuva, 2001; Doyle, 2015; Yousefdeh and Oyelere, 2024). Co-presence and collaborative exploration transform exhibition-making into a relational practice, blurring distinctions between curator, participant and witness. For protest memory, such environments resonate with the collective dynamics of protest itself, even after the original events have dispersed.

7.3 *Virtual museums and the construction of protest memory*

Virtual museums participate in the construction and circulation of cultural memory. Memory studies emphasise that collective memory is sustained through externalised supports, including objects, images and media systems that persist beyond lived experience (Assmann, 2011). Immersive VR archives transform protest artefacts and visual traces into navigable memory environments, enabling encounters with materials often excluded from institutional collections (Chouliaraki, 2015; Favero, 2017; Merrill, 2024).

VR's capacity for spatial immersion and embodied presence allows users to engage with protest memory affectively and ethically, including events they did not personally witness. Research suggests that immersive experiences can intensify affective engagement and support memory recall, producing quasi-lived encounters with past events (Rupp *et al.*, 2019). At the same time, VR environments enable multi-perspectival memory by presenting parallel narratives and contested histories within the same space (Kidd, 2016; Martindale, Hook and Carter, 2025).

Virtual museums operate as counter-archives that sustain protest memory as unfinished, affective and open to reinterpretation. Memory shifts from a fixed institutional narrative to an experiential process shaped by embodied encounter. Immersive environments thus become arenas where the politics of remembering and forgetting are continually negotiated (Van Dijck, 2007; Uricchio, 2011; Schnapp, 2014; Hoskins, 2018).

The legal and political constraints surrounding protest archives are not external limitations imposed upon otherwise neutral systems. Rather, they emerge from the same struggles over visibility, memory and historical narration that counter-archival practices seek to address. As scholars of archives have argued, the preservation of marginalised histories is inseparable from questions of power, ownership, access and representation (Trouillot, 1995; Stoler, 2002; Caswell, 2014b; Azoulay, 2019). Efforts to document protest through photographs, social media content, drone imagery or user-generated contributions require continual negotiation of privacy, consent, participant safety, copyright and political risk. Drone and geospatial imagery may also be subject to aerial data and surveillance regulations, while digital platforms raise questions of moderation, governance and long-term access.

Contemporary artistic and research practices demonstrate how such constraints can be negotiated through the critical reuse of surveillance technologies and archival materials.

Trevor Paglen's work, for example, reuses satellite imagery, military infrastructures and surveillance systems to expose otherwise hidden architectures of power and visibility (Paglen, 2020). Contemporary projects such as [Forensic Architecture \(2026\)](#) demonstrate how alternative archival practices can work within these constraints through transparent methods of verification, contextualisation and ethical curation. Counter-archives operate through such tensions, balancing access, protection, and the preservation of contested memories while remaining vulnerable to censorship, political opposition and technological change.

8. Integrative synthesis

The preceding sections have traced how protest persists beyond moments of collective assembly through remediation and circulation of images across digital platforms, the formation of affective publics, the inscription of dissent within urban infrastructures, and the expansion of surveillance regimes that both capture and obscure political action. Scholarship on immersive media and virtual museums further highlights the shifting conditions under which cultural memory is accessed, navigated and experienced. Bringing these strands into relation enables a clearer account of how protest memory is produced, mediated and encountered across contemporary media environments.

Protest memory emerges as a distributed and contested field constituted through images, artefacts, spatial residues and data traces. These elements remain partial, fragmented, and subject to continual reinterpretation. Counter-archival practices play a critical role in this process by preserving and circulating materials that resist institutional capture while foregrounding the instability and incompleteness of the historical record (Caswell and Cifor, 2016; Merrill, 2024). Protest memory is sustained through ongoing acts of remediation and recontextualisation. Such practices resonate with what Azoulay (2024) describes as civil imagination, in which images and visual artefacts become sites for rethinking political relations, collective memory and civic responsibility beyond institutional narratives.

Affective circulation further shapes how these materials acquire meaning. As protest images and artefacts move across platforms and contexts, they accumulate emotional intensities that bind dispersed publics and orient political identification. These affective dynamics extend beyond representation, operating through embodied encounters that register through sensation and atmosphere. Regimes of vertical vision and surveillance reconfigure how protest becomes visible, translating collective action into spatial inscriptions that exceed individual bodies. Together, these processes suggest that protest is experienced through mediated and distributed forms of encounter as well as direct participation. Such engagement also reshapes political belonging and cultural citizenship, as participation increasingly occurs through shared acts of witnessing and affective alignment across dispersed publics (Couldry, 2006).

Immersive environments transform how such encounters are structured. Instead of treating protest artefacts as static records, virtual environments enable spatial navigation, temporal layering and multi-perspectival engagement. Crucially, these environments foreground interaction as a condition of experience. Engagement unfolds through movement, selection and interpretation, positioning users as participants in the construction of meaning. Empathy therefore emerges through situated encounters that require attention and interpretive agency, rather than as an automatic outcome of immersion.

Bringing these dimensions together, the virtual museum can be conceptualised as a counter-archival empathy machine. It operates as a counter-archive by assembling dispersed and ephemeral materials into a space that resists closure and preserves the contested nature of protest memory. At the same time, it functions as an empathy machine through the alignment

of affective circulation, embodied interaction and interpretive engagement. The emphasis shifts towards encounter and activation, followed by participatory sense-making. This synthesis outlines the conditions under which immersive environments may sustain and reconfigure protest memory. By bringing together counter-archival practices, affective dynamics, spatial residues and interactive design, the virtual museum becomes a site where the afterlives of protest can be encountered as unfinished and open to reinterpretation. It further extends debates on digital heritage and immersive media by foregrounding the political and experiential dimensions of memory-making in contexts shaped by dissent, surveillance and mediated visibility.

9. Conclusion

This review has synthesised interdisciplinary scholarship to show how protest persists beyond moments of collective assembly through remediated artworks, affective circulation across digital platforms, material traces embedded in urban space, and data generated within regimes of surveillance. Across these domains, protest memory emerges as a dynamic process shaped by mediation, repetition, erasure and reactivation. The literature further highlights how contemporary protest cultures are shaped by vertical and computational regimes of visibility that simultaneously enable surveillance and open possibilities for counter-visual practice.

Within this contested landscape, debates on VR as an empathy machine remain unresolved. Research suggests that empathic engagement in immersive environments depends less on presence alone than on framing, interaction and interpretive agency. Building on this insight, the paper has proposed the virtual museum of protest art as a counter-archival empathy machine, foregrounding interaction, embodiment and interpretive engagement in shaping how protest memory is encountered and sustained. This contribution lies in conceptual synthesis rather than empirical demonstration, offering a framework for future research and design-oriented investigation. This framework contributes to debates in digital heritage, urban memory and immersive media by rethinking how politically sensitive and ephemeral cultural materials may be engaged beyond static archival forms.

The framework suggests directions for the design of immersive cultural platforms, including the importance of participatory interaction and the preservation of fragmentary and contested materials. It also reveals the need to account for ethical, legal, political and governance constraints that shape how protest memory is preserved, circulated and accessed. While immersive technologies offer new experiential affordances, their accessibility remains uneven because of hardware costs and technical barriers. As a conceptual review, the aim is to synthesise and extend existing scholarship into a coherent analytical framework. Future research may build on this foundation through empirical and practice-based investigations into how immersive environments are designed, accessed and experienced across different sociopolitical contexts.

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Notes

- [1.] Guerrilla Girls (2026), “Guerrilla Girls”, available at: www.guerrillagirls.com/ (accessed 6 May 2026).
- [2.] See [Paglen Studio \(2026\)](http://paglen.studio/), “Trevor Paglen”, available at: [https://paglen.studio/](http://paglen.studio/) (accessed 6 May 2026); Ai Weiwei (2026), “Ai Weiwei Films”, available at: www.aiweiwei.com/ (accessed 6 May 2026).

2026); [Forensic Architecture \(2026\)](https://forensic-architecture.org/), “Forensic Architecture”, available at: <https://forensic-architecture.org/> (accessed 6 May 2026); and OpenAerialMap (2026), “OpenAerialMap”, available at: <https://openaerialmap.org/> (accessed 6 May 2026).

[3.] See JR (2026), “Inside Out Project”, available at: www.insideoutproject.net/ (accessed 6 May 2026); and Raad, W. (2026), “The Atlas Group”, available at: www.theatlasgroup1989.org/ (accessed 6 May 2026).

[4.] See CyArk (2026), “CyArk”, available at: www.cyark.org/ (accessed 6 May 2026); Louvre (2019), “Mona Lisa: beyond the glass”, available at: www.louvre.fr/en/what-s-on/life-at-the-museum/the-mona-lisa-in-virtual-reality-in-your-own-home (accessed 6 May 2026); Victoria and Albert Museum (2026), “Curious Alice”, available at: www.vam.ac.uk/event/JGmEPwGJ/curious-alice (accessed 6 May 2026); and Musée d’Orsay (2026), “Van Gogh’s Palette”, available at: www.musee-orsay.fr/en/whats-on/exhibitions/van-goghs-palette (accessed 6 May 2026).

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