SOCIETY. SPACES. SCREENS

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SOCIETY. SPACES. SCREENS

Mediated Cities Series

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INTRODUCTION

SOCIETY. SPACES. SCREENS

Mediated Cities Series

Today, the spaces and societies in which we live are infused with media and technology. Smart cities, digital sociology, Industry 4.0 and augmented realities are just a few of its examples. Simultaneously, there are places and practices untouched and unaltered by the effects of technology – whether due to a lack of resources or a reactionary response to change. The questions this raises are boundless and interlinked. They are relevant across spaces, times and disciplines: architecture, urbanism, heritage, sociology, transport, business, education, politics and more. In this context, when we discuss new medias or technologies in any field, we are obliged to think equally about traditional practices, theories and concepts.

In response, the papers collected in this publication ask you to critique contemporary practice in your own discipline. It asks whether it has, or has not, been altered by advances in technologies and medias. For example, CAD involves new modes of design in architecture, while architects champion participatory planning. Urban data informs the management of cities, while the phenomenological experience of space is central to its use. Spatial computing brings disruptive change to public engagement and the ‘democratic process’. At the same time, there are political forces rejecting a future of remote and absentee voting. Social media alters how we interact in spatial settings, yet reports daily on acts in physical space. In every discipline then, technological advances find their analogue parallels.

In exploring the interconnected questions we face today when critiquing the society and spaces in which we live, these papers are open to various questions. They are interested in architecture and urbanism. They ask if data, BIM and intelligent infrastructure have modified our understanding of planning? Equally, they question does design practice continue without it? With regard to the social sciences, they critique whether technology has altered community connections to place, and how have they evolved without it? In the arts and design, they ask how traditional practices continue to thrive in parallel with the digital realm? For cultural theorists they question what happens to identity and tradition in an online world, and what do these mean in ‘unconnected’ parts of the globe? In the field of teaching and learning, they enquire into whether remote pedagogy has altered what happens in the physical classroom?

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FOCUS PULLER: MATERIAL OBJECTS IN VIRTUAL PRODUCTION

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INTRODUCTION

In 2023, walking down the corridors of my University, I found myself peering inside one of the newly installed Virtual Production (VP) studios–a space that had once housed traditional film sets and art department projects. As I watched students learning to use the technology, I noticed something that genuinely surprised me: when the camera operator pulled focus from performers to the LED background screens behind them, the high-resolution digital environment fractured into visible pixels. To me, this wasn't just a technical limitation it was a philosophical prompt that made suddenly visible enforced relationships that this technology demands between humans and objects.

THE TECHNOLOGY (AND ITS IMPLICATIONS)

Virtual Production (VP) represents a significant shift in how films can be made, combining virtual and augmented reality with computer-generated imagery and game-engine technologies. Through this convergence of digital tools, VP allows film crews to view scenes unfolding as they are composed and captured on set rather than in post-production.[1] At the heart of this technology are large LED screens called "volumes," which create responsive digital environments (backdrops) that replace traditional locations, sets or green screen environments.

The appeal of this technology is multifaceted, particularly within institutional contexts. For studios and universities, VP offers obvious economic advantages-reducing location costs, eliminating weather delays, and providing new levels of control over the elements in frame. This control-oriented approach resonates with the jobs-ready mentality that Universities have increasingly subscribed to, reflecting a broader shift toward technocratic solutions in creative education.[2]

The implications of this shift are already evident in contemporary production practices. VP is increasingly being promoted and adopted for productions that would traditionally have been filmed on location. While green screen was primarily associated with high-spectacle Hollywood productions, VP is being marketed as a practical solution for any filmmaker dealing with the "inconveniences" of on location film making. In my observations of Melbourne's professional VP studios, I've witnessed this transformation firsthand: productions that would once have embraced location challenges are now opting for controlled virtual environments where weather, ambient sound, and any other manner of unpredictability can be contained.

This promise of efficiency and control carries significant implications for the craft and poetics of filmmaking. While VP facilitates technical precision, it risks reducing complex environmental

dynamics-wind, light shifts, the interplay of organic elements-to digital approximations. The emphasis on control consequently privileges human actors in the foreground while relegating the environment to a visual placeholder, creating a hierarchy that fundamentally alters the relationship between the performer and space. As universities invest in VP technology, there are questions raised about what is lost when the messy reality of location-filming is replaced by the controlled equivalence offered by virtual technologies, and what this means for our understanding of embodied creative practices.

FOCUS PULLER - A MATERIAL RESPONSE

These material tensions between human presence and digital environments in VP technology formed the basis for *Focus Puller,* a practice-led research project developed at DreamScreen Australia's commercial VP studio. The project began with co-designing the virtual space alongside DreamScreen's technical team. Rather than exploiting VP's capacity for exotic location creation, my research deliberately focused on museum and gallery environments; spaces that form the usual context of my practice. This conceptual restraint served as a methodological intervention, stripping away the spectacular elements that typically dominate VP productions. Consequently, the process involved systematically stripping the virtual environment of its pre-loaded digital assets including marble columns, timber fretwork, and gilded paintings that constitute standard 'museum space' templates. Through this process of reduction, what emerged was an emptied-out space that foregrounded its own virtuality (see Figure 1).

Figure 1. Katie Lee, Focus Puller, 2024, screenshot, unpublished work. This image illustrates the process of removing digital assets to expose the constructed nature of the virtual environment.

The project evolved through an iterative process of filming, projection, and re-filming where captured sequences were edited and re-loaded onto the LED screens within the virtual space. This layered methodology created complex layers of recorded and live performance that became increasingly difficult to distinguish (see Figure 2). Throughout this digital accumulation, the performers remained anchored in material engagement, handling and manipulating physical objects without narrative purpose- their actions forming a kind of embodied resistance to the virtual environment's tendency toward abstraction.

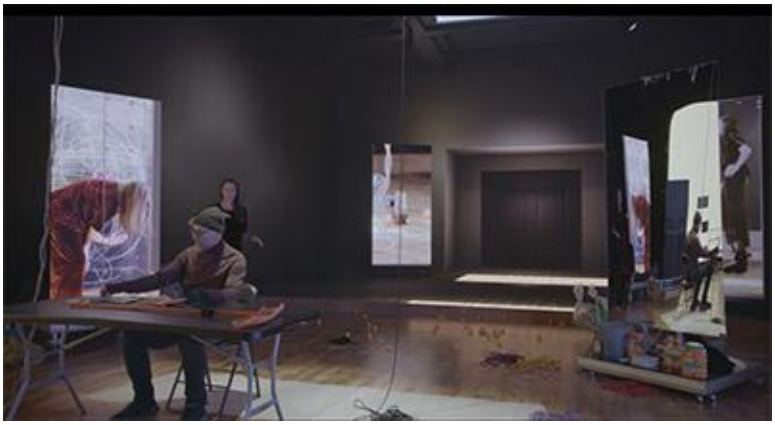

Figure 2. Katie Lee, Focus Puller, 2024, screenshot, unpublished work. This image demonstrates the accumulation of iterative layers during the shooting process, highlighting the interplay between recorded and live elements within the virtual environment.

The project critically interrogated the technological affordances and phenomenological limitations of virtual production (VP) technologies. One instance emerged through our playful interactions with a shaft of light that streamed from an overhead skylight in the virtual environment. This digital light, which in defiance of physical laws never reached the same ground we occupied, became both provocation and metaphor. By introducing a roll of tracing paper as its material double, we began exploring how physical objects might resist or redefine their relationship to the virtual space (see Figure 3).

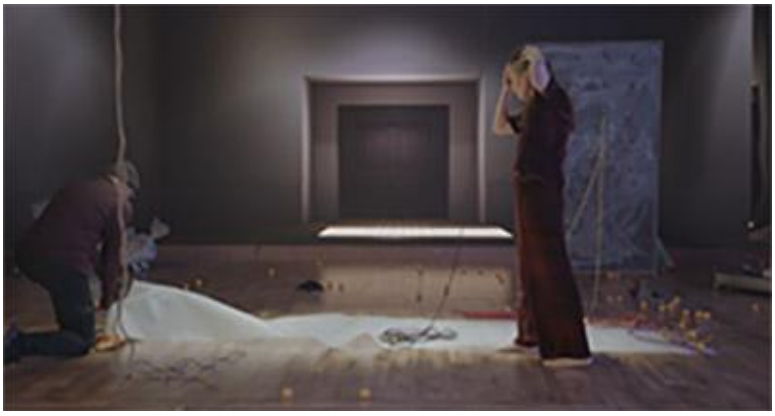

Figure 3. Katie Lee, Focus Puller, 2024, screenshot, unpublished work. This image captures performers engaging with the physical double of the virtual shaft of light, created using tracing paper, to explore the material interplay between digital and virtual elements.

The iterative nature of the project was crucial to this investigation. As the work was filmed and re-projected, the boundaries between live and recorded action began to blur. Performers worked simultaneously with physical objects and their digital doubles, creating layered interactions that questioned VP's usual hierarchy between human actors and their environment. Without narrative structure, these performances focused purely on material relationships—how objects moved, how they responded to touch, how they existed both as physical things and as projected presences within the same space.

PHILOSOPHICAL IMPLICATIONS: MATERIALITY, TEXTURE, AND EMBODIMENT

The seductive rhetoric of Virtual Production frequently centres on economic and environmental efficacy, presenting technological innovation as the answer to production challenges. Yet it is precisely through embodied engagement with this technology that more complex questions emerge. Despite VP's practical benefits, it is the very level of control that production houses champion—this precise management of what appears in focus and out of focus—that raises critical philosophical concerns.

Virtual Production's technological limitations mean that anything beyond the actors must remain deliberately blurred, and this can be conceptualised as an enforced depth of field that produces a kind of 'placelessness'. Unlike traditional cinematographic practices, where ‘pulling focus’ operates as a dynamic negotiation between foreground and background (human to environment, human to other human, human to object/insect/leaf/ant/wind-blowing-curtain) VP demands that certain elements remain perpetually indistinct, marginalising the material and embodied aspects of filmmaking. This enforced visual economy becomes a profound metaphor for contemporary mediation: certain forms of embodied knowledge and environmental relations are systematically occluded, their potential for meaning-making deliberately blurred and relegated to the margins of perceptual experience in the form of a backdrop.

While VP allows for seamless, high-resolution visual effects, it risks stripping filmed space of texture, chance, and the richness of lived environments. This philosophical shift has significant implications for how we engage with making cinema and what its indexical reference is to embodiment, embodied knowledge, affect, and the intricate web of connections that emerge between people, places, objects, atmospheres, and the barely perceptible movements that give life to a filmed moment. VP redefines the relationship between humans, objects, and the spaces they inhabit and pulls-focus from these relations between humans and their environments, to a reduced set of elements that can be acted upon, or that can act upon us.

These tensions between embodied relations and technological control find a critical framework in Hito Steyerl's analysis of digital images. The very limitation I first observed in VP—where pulling focus to the LED screens reveals their pixelated nature—resonates with Steyerl's insights about resolution and technological control. While VP aspires to visual perfection, Steyerl argues that the pursuit of resolution and control often sacrifices depth, texture, and complexity.[3] Her discussion of 'the poor image' resonates with *Focus Puller*, not through direct engagement with pixelation, but in how both the technical limitation of VP and my artistic response embrace different forms of imperfection as resistance to technological control. Where Steyerl sees pixelation as exposing digital media's constructed nature, making visible its own conditions of production and circulation,[4] *Focus Puller* deliberately foregrounds the messiness of material encounters.

This systemic logic of control extends beyond technical specifications into fundamental questions about how we engage with space and materiality in contemporary screen practice. VP's inherent pixelation when focus shifts to the LED screens becomes a material metaphor for the technology's own limitations—its inability to fully contain or control the complexity of lived experience. *Focus Puller* responds to this through its own forms of resistance—the unpredictable materiality of performers' encounters with objects, glimpses of the set and camera operators, the overlapping of recorded and live action. These moments of productive tension echo Steyerl's valorisation of images that reveal their own conditions of production, what she terms the 'conformism and opportunism' intrinsic to high-resolution digital production.[5]

Figure 4. Katie Lee, Focus Puller, 2024, screenshot, unpublished work. This image reveals the presence of cameras reflected in the mirrors, emphasizing the mediated nature of the virtual production environment and its layered visual construction.

Steyerl's embrace of pixelation points toward a deeper philosophical recognition: that the material properties of digital screens—their limitations, glitches, and imperfections—more authentically reflect our technology-mediated existence than VP's pursuit of seamless illusion. Where VP attempts to hide its digital nature through ever-higher resolution and controlled depth of field, *Focus Puller* intentionally works with and through these material constraints. This acknowledgment of screen materiality opens up possibilities for understanding how we actually inhabit contemporary screen environments—not as perfect, controlled spaces, but as complex intersections of the virtual and physical, the digital and embodied.

CONTROL AND TECHNOLOGICAL ENFRAMING

This critique of technological control connects to Martin Heidegger's concept of "enframing" (Gestell).[6] Philosophically, VP is readily situated within Gestell, a term Heidegger uses to critically interrogate how modern technology reduces the world to a resource to be controlled and manipulated.[7] VP epitomises this enframing tendency, as its controlled environments—dynamically adjusting lighting, parallax, and background elements in real-time—replace the unpredictability of physical space with programmable realities. This prioritisation of efficiency and control erases the chaotic and generative potential of real-world environments, reinforcing a utilitarian worldview that marginalises non-human agency.

Yet, it is precisely these unpredictable, chaotic forces that have historically given cinema its life. In traditional filmmaking, longer takes and on-location shooting allow for the serendipity of natural environments—wind shifting leaves, birds flying, or the interplay of light and shadow. These moments, described by historical film critics Andre Bazin as the "world going on as it would," are replaced in VP by programmed, predictable digital environments.[8] The exclusion of these dynamic elements reduces the cinematic experience and reflects a philosophical narrowing of our relationship to the world.

MATERIAL AGENCY AND RESISTANCE

Jane Bennett's concept of 'vibrant matter' aligns with long-held Indigenous understandings of material agency and human-environment relations and helps articulate what is at stake in this technological flattening of experience.[9] Bennett posits that non-human actors—whether objects, landscapes, or weather systems—possess agency and vitality that contribute to the richness of human experience.[10] This understanding of material agency manifests directly in *Focus Puller's* methodology, particularly

in moments where performers engage with physical objects, and in moments where objects and their materiality are privileged over the illusory qualities that VP is usually employed to produce. Following Bennett's thinking, objects have impact, they effect and affect us, and have energy, vibrancy and relations beyond being props in human environments.

The cinematic practices of Agnes Varda and James Benning demonstrate what happens when we resist technological standardisation and instead stay with the material contingencies of filmmaking. In Benning's *Ten Skies*, the camera holds steady on changing cloud formations for ten discrete ten-minute takes.[11] Nothing "happens" in conventional narrative terms, yet everything is happening—light shifts, clouds build and dissipate, wind reshapes forms, birds cut across the frame. Similar material attention emerges in Varda's *The Gleaners and I*, where her handheld camera follows the rhythms and textures of gleaning — hands caked in earth, bodies bending to gather, faces turning toward and away from her lens.[12] These works grant agency to environmental forces that virtual production systematically excludes and valorise the temporal and spatial richness of lived environments.

The limits of VP technology become evident watching students learn to use it. Where filmmakers like Varda and Benning allow atmospheric and environmental forces to co-author their work through durational engagement, VP demands we program and control these elements in advance. The LED volumes generate high-resolution imagery but flatten the materiality of filmmaking into digital assets. The possibilities that emerge from staying with a shot—weather patterns shifting, light moving across surfaces—disappear. Each environmental element must be pre-visualized and programmed, eliminating 'the world going on as it would,'.[13] The VP studio becomes a space where nothing can happen outside predetermined parameters.

Focus Puller works as a critical intervention into virtual production, using sculptural and performative methodologies to question the seeming neutrality of digital environments. The project's political potential emerges through its disruption of how VP constructs relationships between humans and their environments. Through an iterative process of performance, projection and re-performance—feeding recorded footage back into LED screens and layering it with live action - the project confused the distinction between VP's technical limitations of fore, mid and background elements. Rather than engaging directly with the pixelation of LED volumes, the process emphasised the mediated nature of VP workflows, creating a space to reflect on how materiality and embodied interaction might challenge the hierarchies imposed by the technology. This process opened questions about VP's aesthetic conventions while suggesting alternative modes of engagement within screen environments.

At the heart of *Focus Puller* lies a critique of how VP systematically excludes incidental and non-human agency - revealing questions about materiality and mediation in contemporary screen practices. Laura Marks' theorisation of haptic visuality helps frame this intervention. Her critique of "slickness" in digital media and her advocacy for cinema that rejects high-resolution perfection for textures that evoke touch and embodied engagement, connects to *Focus Puller's* approach.[14] The project embraces imperfection, allowing for unpredictable material encounters - performers with objects, glimpses of set and camera operators, overlapping actions and interactions. Through this process, VP's enforced relationship between figure and ground begins to blur, opening possibilities for material encounters within digital production.

While *Focus Puller* cannot claim to fully critique the politics of VP, its interventions reflect a broader exploration of what emerges when we deliberately resist the perfectionist tendencies of this technology. Marks argues that political cinema necessarily "calls attention to the systems it critiques" by exposing its own making.[15] Through this lens, *Focus Puller's* embrace of imperfection and unpredictability offers an alternative aesthetic framework, one that values relationality and materiality over VP technology's attempt at seamless control.

The political implications of this critique extend beyond technical concerns into questions of value

and creative agency. VP's emphasis on control and efficiency manifests distinctly neoliberal imperatives - ones that privilege commodification over creativity, systematically marginalising the serendipitous and relational aspects of artistic production. Through its deliberate subversion of these values, *Focus Puller* opens space for alternative approaches to VP technology. Approaches that foreground materiality, chance, and embodied interaction as essential rather than incidental components of creative practice.

Through its iterative process, *Focus Puller* gestures toward alternative possibilities for cinematic production within VP—possibilities that foreground the agency of objects and environments alongside human performance. By blurring the traditional relationship between figure and ground, the project explored how VP might open up to more inclusive, relational, and materially engaged approaches to filmmaking within VP environments, or at least showcase an alternative set of operations that utilise the technology in alternative ways.

BROADER IMPLICATIONS AND CONCLUSION

By situating *Focus Puller* within the lineage of slow cinema and avant-garde practices, this research examines how emerging screen technologies subtly reshape creative practice and aesthetic possibility. While VP offers valuable solutions to production challenges, its hyper-controlled environments reflect broader shifts toward efficiency and scalability in creative practice. These shifts, often implemented gradually through institutional adoption and industry standardisation, quietly transform how we engage with space, time, and materiality in our work.

In turn, this need for precise control over depth of field in VP points to broader concerns about how new technologies shape our relationship to materiality and chance. As universities adopt VP technology---driven by cost-effectiveness and industry relevance---we risk accepting production methods that alter how filmmakers and performers engage with their environments. While VP might seem like just another tool in a creative toolkit, its systematic adoption raises questions about what we might be losing, and what 'reality' means in relation to the screen.

Focus Puller contributes to this discourse by revealing both the constraints and possibilities within VP environments. Through its iterative methodology and material interventions, the project opens pathways that honor embodied interaction and chance. As these technologies integrate into creative and educational spaces, we must cultivate approaches that maintain space for material exploration, embodied knowledge, and the uncertainty that enriches artistic practice. The challenge lies not in rejecting technological innovation, but in developing methodologies that preserve the relationship between material encounters (messy, overlapping and rough) and creative discovery. *Focus Puller* invites us to imagine ways of working with technology that celebrate the vibrancy of lived spaces along with human and non-human interrelations.

NOTES

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[2] Australian Government Department of Education, “Job Ready,” *Department of Education*, accessed February 19, 2025, https://www.education.gov.au/job-ready.
[3] Hito Steyerl, *The Wretched of the Screen* (Berlin: Sternberg Press, 2013), 31.
[4] Steyerl, The Wretched of the Screen, 34.
[5] Steyerl, *The Wretched of the Screen*, 33.
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[7] Heidegger, “The Question Concerning Technology,” 307-341.
[8] André Bazin, *What Is Cinema?* Volume 1, trans. Hugh Gray (Berkeley: University of California Press, 2005), 89.
[9] Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010), 13; see also Tyson Yunkaporta, *Sand Talk: How Indigenous Thinking Can Save the World* (Melbourne: Text Publishing, 2019), 45.
[10] Bennett, *Vibrant Matter*, 13.
[11] James Benning, dir., *Ten Skies* (California Institute of the Arts, 2004).
[12] Agnès Varda, dir., *The Gleaners and I* (Ciné Tamaris, 2000).
[13] Bazin, What Is Cinema? Volume 1, 89.
[14] Laura U. Marks, *Touch: Sensuous Theory and Multisensory Media* (Minneapolis: University of Minnesota Press, 2002), 95.
[15] Marks, *Touch*, 95.

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DISRUMPO IN THE VUJA DE: BREAKING THE DOLDRUMS OF SCREEN TIME TO ENHANCE URBAN DESIGN AND DEVELOPMENT FUTURES

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INTRODUCTION

To stimulate creativity in the design process and enhance verbal and graphic communication skills and accountability among peers, it has become increasingly prudent to become disruptive. Disruptions in the form of stimulating collaborative activities, disruption in the form of frequent peer review and critique, and disruption in the form of timed activities to break students away from their entertainment saturated attention span have become necessary. Looking over the shoulders of current design students at their workspaces, one can observe a variety of streaming television shows, YouTube video streams, and Twitch / gaming streams, all while the students are supposed to be actively engaged in creative work. The Latin word *disrumpo,* a root word for disrupt, suggests to "get broken," or to "cause to break apart/off, shatter/burst/split, disrupt/sever."[1] This concept provides food for thought regarding the conditions of learning environments in the post Covid-19 era. In one sense, the disruption of the pandemic to the pedagogical paradigm and learning environments still has a tremendous effect on learning gaps seen in higher education today.[2] In another sense, the *disrumpo* that we experienced served to accelerate, legitimize, and finalize several technologies, tools, and platforms that we consider common and essential to the practice of higher education. Arguably, it is now difficult to imagine a world without Zoom or virtual meeting platforms.

AN ABRUPT TRANSITION TO HYFLEX LEARNING

Therefore, as disruptive as the pandemic was, the experiences and conditions were also an opportunity to test different media, modalities, activities, and platforms for collaboration, concentrations, and critique in the design studio. The faculty and staff at the author's host university began by physically adapting the studio learning environments in the summer of 2020 to accommodate recommendations by the Centers for Disease Control for social distancing as adopted by university leadership. The author's host university in Indiana chose to allow hybrid or hyflex learning[3] for studio courses, despite consistent infections, quarantines, and absences.

Applying digital review boards in the Hyflex design studio

One online software platform that emerged and that became quite useful was Conceptboard,[4] a digital review board that allowed for remote collaboration and sharing of visual materials, much like working on a markerboard or tack wall panel for pinning up documents, images, comments, ideas, and interactions in the socially distanced situation. In effect, the digital review board interface effectively

replaced the critique and review modality typically known as the pin-up or the crit in design and fine arts education. Small group discussions (Figure 1) that are a hallmark of studio-based learning needed to be re-thought in a socially distanced, hyflex situation.

Figure 1. Small group discussions in a foundational design studio help learners investigate options and alternative directions for their creative work. Photos by author, Spring 2005.

Facilitating interactions with digital review boards

The author was curious if Conceptboard could facilitate interactive collaborative activities typically done with paper. To test the virtual interactivity possible in a digital review board, the author used a two-dimensional tile pattern exercise as found in the pedagogies of typography, graphic design, fashion / fiber arts / quilting, interior design, architecture, landscape architecture, and urban planning. The examples of tiles as aggregated patterns can be found across the design disciplines and even a variety of world cultures. Testing different arrangements of patterns in Conceptboard proved to be a refreshing collaborative activity, rich with discussion comments and peer review in real-time thanks to the nature of the digital review board platform (Figure 2).

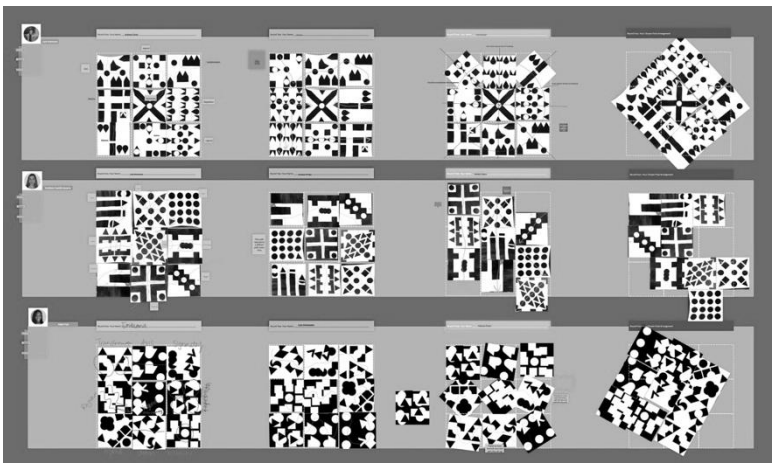

Figure 2. A select portion from an interactive real-time game exercise built by the author with 2D work from students in the Conceptboard digital review board platform. Capture by author. Spring 2021.

FRESH EYES AND THE VUJA DE

Marcel Proust's argument that "the real act of discovery consists not in finding new lands, but in seeing with new eyes" [5] remains inspiring for innovators and innovation. The act of trading desks also finds itself very useful in the design studio to promote a fresh eye approach or stimulate a feeling of "vuja de".[6] This so-called fresh eye[7] approach remains an effective learning tool for the design student to explore new possibilities and directions above and beyond one's own aesthetic tendencies and biases, or as Bill Taylor explained in the *Harvard Business Review*, the act of "looking at a familiar situation with fresh eyes, as if you've never seen it before, and with those fresh eyes developing a new line of sight into the future."[8] In in a blended / distance learning modality, the sharing of close personal spaces and crafting tools was discouraged, even deemed unsafe in the learning environments between the spring of 2020 and the fall of 2022. Given the social distancing restrictions of the time, students responded very positively to the activity. As student Darwin Hiller reflected,

"This activity helped me see other's thought process in their designs. I like how I was able to look at someone else's work and manipulate it in new ways. I think by doing this I was able to see my work in a new way as well and even give me ideas on what I could have done differently. I feel like using the Concept board technology allows us to do things socially distanced and still get all the benefits of group collaboration."[9]

The concerns of screen time

The use of digital review board platforms such as Miro and Conceptboard facilitated such opportunities but also added to the sheer amount of screen time expected of students. Concerns over the amount of screen time that students are experiencing is being expressed in published research[10] and verbally from students following the nearly many months spent in online learning modalities across the years 2020-2022. Fielding the frustration expressed by students in reading and understanding design project briefs is now a palpable part of teaching design. Shepherding students from their comfort zones through fear and into the learning and growth zones continues to be a challenge with this generation of learners. Arguably, more hands-on activities and active learning activities are both capable and arguably needed to get their attention and return to a path of learning and growth.

A return to form

Following the lifting of pandemic era restrictions, the author sought to revive and facilitate activities that could return to haptic or hands on [11] learning activities. The author returned to the tile project to test the interactions. Through a series of guided, prompted rounds, students traded desks and came up with several options for layouts for their chosen tile designs (Figure 3).

Figure 3. In the act of trading studio desks, learners can generate multiple alternatives and solutions for a design problem whilst applying a fresh eyes approach to the process. Steps are journaled so that each learner has a record at the end of the activity. Photos by author, September 2024.

Student reflections on the ability to do this in person and in proximity was a fresh opportunity for them to reflect on the roughly two or more years that they spent in distance learning situations in high school, particularly in subjects that were academically rigorous or creative. Following this activity, student Braylon Metzger commented that:
"Today challenged my brain to combine different patterns so that lines could match up. This changed the way that I looked at my concepts… It was nice to see different ideas from my classmates. I liked this activity because it was in person. I would have been more frustrated and lost patience if it was online."[12]

CONCLUSION

These studio design projects and collaborative activities at the foundational level do mimic other practices of public participation in the built environment, and students are able to apply them into their professional lives. It is observed that a return to collaborative, interactive physical modeling of urban development is a lively and necessary activity to communicate vision and build consensus in the construction and revitalization of cities, towns, neighborhoods, and districts. The ability to quickly investigate design and planning options quickly with a haptic, interactive activity allowed for time for craft and refinement of proposals. It also meant that screen time could be used more efficiently as students refined their ideas in Adobe Illustrator and InDesign, rather than try hatch ideas initially in the software. Careful consideration of all these opportunities and factors have become necessary to help communities continue to recover from the upheaval of the pandemic and respond to rapidly changing factors in the economy, and as communities examine difficult choices and possibilities for their future.

NOTES

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CONVERSATIONS WITH TREES: A BIOPHILIC DIALOGUE BETWEEN NATURE AND DESIGN

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INTRODUCTION

The Oval, Ohio State University's iconic green space at the heart of campus, serves as a vibrant intersection of natural beauty, history, and community. Whether visitors are strolling, enjoying a picnic, or simply enjoying a moment outdoors, they are surrounded by trees that carry rich human narratives. Each tree on the Oval tells a story, deeply embedded in the university's history. The self-guided walking tour, "Trees of the Oval" (Figure 1), developed by the university's Chadwick Arboretum and Learning Gardens,[1] highlights the most significant trees in this central campus location. Thirty-one trees were selected for their historical importance, diversity, and ecological and economic value. Among them is the English oak, believed to be one of the trees Jesse Owens received from Adolf Hitler after his historic four gold-medal wins in the 1936 Berlin Olympics.[2] Another notable tree, the chinkapin oak, was planted in honor of the university's alumni who served during World War I, further embedding the space in collective memory.

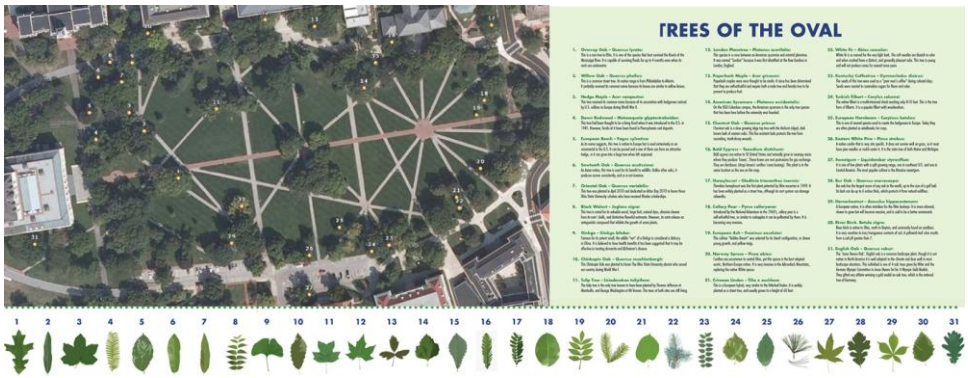

Figure 1. Trees of the Oval Tour

This paper introduces *Conversations with Trees*, a mixed-media project inspired by "Trees of the Oval," that reflects on the deep connection between people and trees. The project explores three types of interactions: first, a photographic narrative installation; second, an immersive Augmented Reality (AR) experience; and third, a conversational workshop. The goal of *Conversations with Trees* is to increase engagement with the natural world among students and the public, fostering a stronger sense of connection and responsibility toward nature. By blending physical and virtual experiences, the

project creates an immersive and educational platform for both the university community and the broader public to deepen their understanding of the ecological importance of trees.

INSTALLATION: CREATING *PHOTOGRAPHIC* NARRATIVES

The *Conversations with Trees* installation features 35 accordion books created by students in the Introduction to Visual Communication Design courses from the Spring semesters of 2020 and 2024. This course, aimed at second-year Visual Communication Design majors, introduces students to *PhotoGraphic*[3]—a method that integrates photography, typography, and graphic design to create layered meaning through juxtaposition and synthesis.[4] By the end of the course, students develop a portfolio including postcards, posters, and accordion books. Previous course themes have addressed social and sustainability topics such as "Better Communities," "Water for Wellness," and "Local and Sustainable Food." In 2024, the *Conversations with Trees* theme encouraged students to develop a biophilic sensibility, crafting narratives that connect nature, well-being, and identity through meaningful interactions with trees.

The accordion book project began with a site visit to the Oval, led by a professor from the Department of Horticulture and Crop Science in the College of Food, Agricultural, and Environmental Sciences. This professor, also the Director of the Chadwick Arboretum and Learning Gardens, fosters programs that utilize the Arboretum as a living classroom for both the campus and broader community. During the visit, students were introduced to the trees of the Oval and learned about their ecological benefits and biophilic qualities. This hands-on experience deepened students' understanding of the trees' histories, origins, and unique features, allowing them to connect more intimately with nature. Students selected individual trees to study, exploring their forms and environmental significance (Figure 2).

Figure 2. Site Visit to the Oval and Students' Sketches

Throughout the concept development, guest lectures on ecological literacy[5] and design reviews on visual narrative enriched the students' perspective on the topic. These included talks on designing for sustainability, the theory of biophilia,[6] the concept of 'seeing the forest,' and storytelling through multimodal rhetorics (Figure 3). Drawing on these insights, each student created a 14-page accordion book that captured the emotional, social, political, and ecological dimensions[7] of their chosen tree. Inspired by a biophilic dialogue,[8] these visual narratives tell unique stories curated by the students.

Figure 3. Guest Lectures

Guided by a design brief that combined structure with creative inspiration, the project challenged students to blend type and images into a rhythmic theme that encouraged thoughtful interaction between each page. The goal was to create a cohesive flow that maintained a consistent mood while offering surprises with every turn. The brief emphasized the visual thinking process,[9] challenging students to experiment with different visual elements—photographs, illustrations, pictograms, and graphic elements—working to create dynamic relationships. Students also considered the interplay between type and imagery, integrating letters, words, sentences, and paragraphs to complement the photographs, creating a continuous flow of meaning.[10] Ultimately, the goal was to develop a cohesive visual experience where the photographs and design elements worked together to drive the narrative forward (Figure 4).

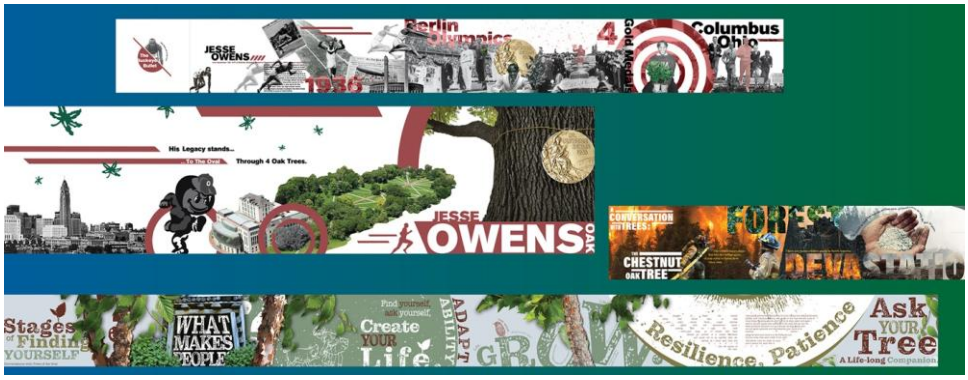

Figure 4. Accordion Books

The design brief also included two sets of narrative prompts to guide students in exploring both personal connections and future visions for trees. The first set, titled *Emotional and Intellectual Connection*, asked students to design a composition that reflects the personal connections they have with trees. Students were encouraged to think about both intellectual and emotional associations with trees, considering aspects such as *Imaginary Personification*, where they envisioned the tree as a person or friend, expressing its appearance, personality, and uniqueness. They were also prompted to reflect on the tree's *Formal Qualities Exploration*, such as its color, seasonal changes, and structural elements. Additionally, students were encouraged to draw from *Cultural References*—inspiration from books, films, or art—to explore cultural or societal meanings related to trees. The brief also invited students to share *Personal Stories*, reflecting on memories or personal connections with trees that highlight their significance in their lives. Finally, under the prompt *Sensory Experience*, students were encouraged to imagine how it would feel, smell, sound, and taste to engage with the tree on a deeper sensory level.

The second set of prompts, titled *Livable Future Inspiration*, invited students to imagine the role trees will play in future societies, particularly in terms of sustainability, health, and cultural relevance. Students were encouraged to consider *Wonder and Connection*, envisioning a tree story that renews our sense of wonder and deepens our connection with nature and identity. They were also asked to reflect on *Sustainability Reflection*, exploring ways to protect trees for a sustainable future and the actions necessary to ensure their survival. The prompts included imagining how trees could shape *Alternative Futures*, influencing culture, technology, or relationships. Additionally, students were asked to reflect on *Personal Impact*, considering how interactions with trees have nurtured and protected individuals, and how these relationships might evolve in the future. Lastly, under *Inspiration for Engagement*, students were invited to explore how interactions with trees can inspire empathy and healthier ways of living in the years to come.

The final accordion books were displayed during the 2024 Arbor Day Celebration on campus (Figure 5), organized by the Chadwick Arboretum and Learning Gardens, promoting environmental responsibility and appreciation for trees. The books were arranged vertically, resembling columns of trees, creating an immersive experience for visitors as they "walked through a forest of stories."

Figure 5. Accordion Book Installation, Arbor Day Celebrations

INTERACTION: INCORPORATING AUGMENTED REALITY EXPERIENCE

During the following summer semester, the *PhotoGraphic* course instructor collaborated with designers from the university's Emerging Technology Studio to explore how emerging technology could enhance interactions with the "Trees of the Oval," creating a more immersive and engaging environment. This collaboration also provided a unique opportunity for the *Conversations with Trees* installation to be showcased in September as part of a signature program for World Design Capital San Diego Tijuana 2024. The event provided a major platform for creativity, education, and exploration, with the year's theme, "Creating a Sense of Belonging Through Design,"[11] focusing on how spaces, events, and interactions can be designed to support and include everyone.

Recognizing the potential for introducing interactivity into the installation, the *Conversations with Trees* project team sought to explore how technology could enhance visitors' engagement with nature. This led to the development of an AR experience designed to offer a new perspective of the physical installation, sparking conversations about the ways people connect with their surroundings. As Litleskare et al.[12] suggest, "Virtual nature may offer the possibility to 'boost' human-nature interactions (augment), leading to more restorative experiences as well as enhanced knowledge and engagement." Expanding upon this idea, the project team integrated AR technology into the installation, providing visitors with a dynamic, interactive experience that invited them to engage with the "Trees of the Oval" in a novel way, enhancing their interaction with both the physical and digital

aspects of the space. Custom-designed AR features overlaid the physical installation with digital representations of tree leaves from the Oval, adding layers of engagement.

In this experience, viewers wore mixed reality headsets, which populated their physical surroundings with digital leaves and a 3D map of the Oval, created using a database from the university's Chadwick Arboretum and Learning Gardens. As they approached the 3D map, trees and surrounding leaves were labeled with color-coded numbers, guiding viewers to identify the trees they corresponded to (Figure 6). For instance, if a leaf labeled "11" was picked up, viewers could locate tree number 11 on the map and learn it belonged to the Tulip Tree. This interactive experience was designed to be open-ended, offering a range of engagement options. Visitors could take a more educational approach, learning about the trees, or a more playful one, such as using a virtual branch to poke the digital leaves, making them move and collide in the exhibition space. Another playful feature allowed users to scale the trees using touch controllers, enabling them to inspect the trees up close or alter their size and placement, creating unique tree compositions and meanings.

Figure 6. AR Concept Sketches

The integration of virtual and physical elements in this project demonstrates how design and nature can cultivate a deeper sense of connection by creating spaces that bridge the digital and natural worlds. These spaces invite individuals to engage more meaningfully with their surroundings. Through the use of AR, the expanded installation encourages visitors—whether familiar with the landscape or experiencing it for the first time—to interact with their environment in an accessible and thoughtful way. For newcomers, the AR features provide context, enhancing their understanding of the space. By combining the tangible presence of the trees with digital overlays, the project enriches visitors' perceptions of the natural world and their personal connection to it, encouraging a more thoughtful interaction. Instead of replacing traditional spaces, the digital elements complement the physical environment, offering an additional layer of engagement. This model not only strengthens connections with the landscape but also demonstrates how digital innovations can coexist with and enrich physical spaces, fostering a greater sense of community for all. The enhanced version of the *Conversations with Trees* installation was featured in an expanded autumn exhibition in San Diego-Tijuana (Figure 7), extending its impact and reaching a broader, diverse audience.

Figure 7. "Trees of the Oval" AR Experience

WORKSHOP: INSPIRING COMMUNITY CONVERSATIONS

The *Conversations with Trees* project team proposed not only an installation and AR experience for the World Design Capital San Diego Tijuana 2024, but also a conversation workshop. Titled *Being & Belonging: Exploring Identity and Community Connections Through Conversations with Trees*, the workshop drew inspiration from Uday Dandavate's book, *Being and Belonging: A Journal of Curiosity and Imagination*. Uday, a renowned global design figure and co-creation champion, was invited to lead the session, bringing his expertise in culture, psychology, communication, and design.

The exhibition and workshop were held at the Mingei International Museum in San Diego (Figure 8), a space known for fostering creativity and community engagement. Open to the public, the workshop was fully booked in advance, with participants coming from a wide range of backgrounds. Despite their differences, all shared a common emotional connection to trees and forests, a powerful unifying theme that transcended cultural and professional boundaries.

Figure 8. Exhibition and Workshop Held at the Mingei International Museum in San Diego

Uday's goal was to guide participants in discussing nature's principles of harmony and coexistence, helping them reflect on how these principles could promote a balanced, sustainable, and interconnected way of life. The workshop aimed to connect trees with broader human experiences, fostering conversations about identity, community, and the environment. Uday moderated with sensitivity, inviting participants to explore trees beyond their biological and environmental roles, encouraging emotional and philosophical reflections. Activities included discussions, poetry readings, role-playing exercises, and thoughtful reflections, with participants imagining themselves as trees, sharing thoughts on humanity and the environment. This creative exercise allowed individuals to empathize with trees and explore interconnectedness.

The resulting dialogue was diverse and profound, with insights drawn from participants' personal experiences. By the end, there was a palpable sense of unity, and attendees were energized to integrate nature-inspired principles into their lives. The workshop explored how trees have a calming effect on the human spirit, helping individuals shift from the present moment to a more timeless perspective. Participants also shared how trees contribute to emotional and physical healing, emphasizing their restorative impact on well-being. The group further explored the idea of tree communication, realizing how trees interact with one another and the broader ecosystem, adding a deeper layer of appreciation for nature's interconnectedness. A more philosophical insight emerged around the notion that trees possess imagination, using this to cooperate and thrive, ensuring survival and supporting the flourishing of the surrounding environment. These insights continued to fuel conversation, sparking a desire to incorporate sustainability, regenerative design, and emotional connections with nature into communities. Participants were eager to spread the workshop's themes, fostering an expanding network of engagement.

REFLECTION: NATURE, DESIGN, WELL-BEING, AND INTERCONNECTEDNESS

Trees symbolize growth, grace, and inspiration, resonating deeply with the biophilia theory, which emphasizes humanity's inherent connection to nature. This idea played a central role in the curriculum, encouraging students to design with both personal well-being and nature in mind. One student shared how nature offered a sense of escape, strength, and safety, serving as a reminder of life's interconnectedness and a valuable source of learning. Another student expressed a deepened appreciation for trees in urban spaces, recognizing their positive influence on health and well-being. These reflections show how biophilic principles enriched the students' creative process, fostering a deeper understanding of nature's role in design.[13]

The AR experience was designed to animate the installation themes without obstructing the view, creating an enhanced interaction with the exhibition. As the experience took shape in the gallery, the designer observed that it allowed for ongoing conversations between those wearing headsets and other visitors. One insightful piece of feedback came from Ohio State campus visitors, who noted how the experience helped them recognize natural surroundings they had previously overlooked. The designer shared a personal reflection: "It's exciting to be able to recognize the different tree types on my morning walk to work on the Oval. It's fascinating to see how this virtual-physical intersection extends into experiences outside the gallery."

The AR component inspired visitors to reconnect with their natural surroundings in unique ways. One remarked, "The AR experience made the familiar strange again, infusing it with a sense of wonder and curiosity. For those who might otherwise overlook the natural world, it offers permission to reconnect." Another visitor observed, "While physical immersion in nature is irreplaceable, the AR program helps fill that gap meaningfully for those who might not always have access to such environments, regardless of age."

The reflections, feedback, and insights from students, the AR designer, and visitors highlight the profound impact of blending nature with design. By integrating AR with the physical installation, individuals could explore their relationship with the natural world in new and thoughtful ways. This fusion of virtual and real fostered a deeper connection to the environment and allowed participants to experience a renewed sense of belonging, well-being, and a shared responsibility to preserve the natural world.

CONCLUSION: FUTURE OPPORTUNITIES

After the World Design Capital San Diego Tijuana 2024 event, The *Conversations with Trees* project was displayed at the university's downtown gallery, Urban Arts Space, reaching a wider public audience. This project has also been invited to showcase at the university's Marion campus Sustainability Gallery in April 2025, coinciding with the National Arbor Day Celebration. According to the gallery director, *Conversations with Trees* aligns with three key sustainability goals: first, encouraging the development of new sustainability knowledge and solutions; second, fostering a culture of sustainability both on and off campus; and third, teaching sustainability through innovative approaches inside and outside the classroom.

Audience feedback suggests that the current experience resonated most with individuals already familiar with the Ohio State campus. To make the AR experience more relatable to those unfamiliar with the campus, one approach could be to incorporate creative data visualization that highlights the ecological, economic, and social importance of the represented trees. Another idea is to develop an interactive storytelling platform where both on- and off-campus community members can share personal stories about the trees of the Oval. By contributing their narratives, individuals would co-create a living exhibition alongside the project team.

The team has already collected hundreds of "reflection leaves" from past exhibitions (Figure 9), with visitors responding to prompts like, "What would you say to humans if you were a tree?" or "How can interactions with trees inspire healthier ways of living for future generations?" Going forward, these reflections could be gathered via a digital survey linked to each tree's webpage. The survey data would provide valuable insights into the emotional impact of the project and contribute to ongoing dialogues through future workshops, panel discussions, and traveling exhibitions focused on sustainability, human-nature relationships, and environmental stewardship. Additionally, digital platforms would offer learning resources and contact information for visitors, students, scholars, and collaborators, encouraging broader participation and deeper community involvement.

Figure 9. The Reflection Leaves Wall

NOTES

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ENVISIONING JUSTICE: A SPECULATIVE NARRATIVE FOR ADDRESSING URANIUM CONTAMINATION IN THE NAVAJO NATION

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THE SACRED AND THE PROFANE

At the heart of the Navajo Nation —my mapping journey emerges as a chronicle of labor, an ever-evolving narrative inscribed into both geological time and human history. It is a story of harmony turned commodity, revealing the intricate entanglement between people and land. From a geological perspective, the land itself is a living record of labor. Tectonic upheavals, volcanic surges, and the slow choreography of wind, light, and water have sculpted the mesas and buttes that define this vast terrain. These formations, shaped over millennia, bear silent testimony to a history of transformation, evident in the geological cross-sections from Black Mesa to the Chuska Mountains.

For the Navajo, the land is sacred—its mountains, mesas, and valleys form an interconnected geography of spiritual and cultural identity. After 1868, however, a new form of labor shaped this land—the establishment of a codified boundary that designated indigenous land as a reservation, isolating it from the rest of the United States. The division of land into plots for subsistence farming and livestock fractured communal indigenous holdings, cutting off connections to sacred spaces. This disruption erased not only physical places but also the oral traditions and wisdom that once anchored them. [1]

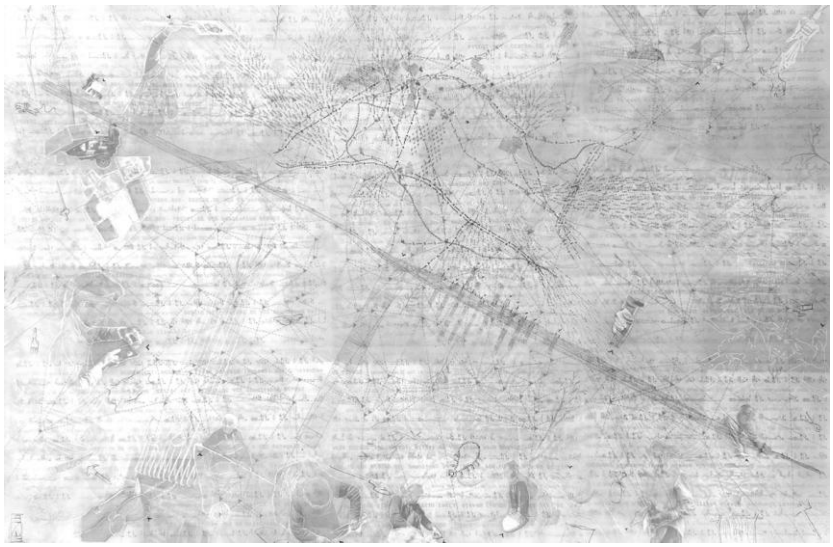

Figure 1. Vellum mapping drawings of Navajo craftsmanship and labor

In Research is Ceremony, Shawn Wilson speaks of Indigenous identity as rooted in the earth where traditions and customs inseparable from the land.[2] Mapping labor, then, became an act of reverence as illustrated in Figure 1, tracing the threads of craft and knowledge embedded in the terrain. Other forms of labor—horse farming, silversmithing, sand painting, sheep herding, and weaving—illuminate a deeper relationship between the Navajo people and their environment, transforming the land's gifts into healing, storytelling, and resistance against erasure.

Alternatively, the Cold War cemented an exploitative relationship between the Navajo people; who provided labor, and an environment increasingly stripped of its resources. Unlike the extractive speculators who saw land as a commodity, the Navajo understood it as eternal, beyond ownership or trade. Yet to corporations, it was merely a resource—one to be bought, depleted, and discarded. The outcome: a transformed landscape, marred by the remnants of industrial activity. In this once-sacred space, extraction turned into something profane. The Navajo people were initially grateful for the employment opportunities mining corporations provided. However, geographic isolation, corporate greed, language barriers, and lack of access to health care left the communities largely uninformed, only realizing the devastating consequences as illness began to affect their families in the 1940s.[3]

Through my own labor, I sought to peel back layers of history, revealing the intricate and complex tapestry of the Navajo Nation's relationship with their land. These are showcased in the photographs and mapping drawings in Figure 2. Across the numerous brownfield sites uranium, coal, oil, and gas extraction have left indelible scars resulting in sites of displacement, environmental devastation,[4] and generational health crises.

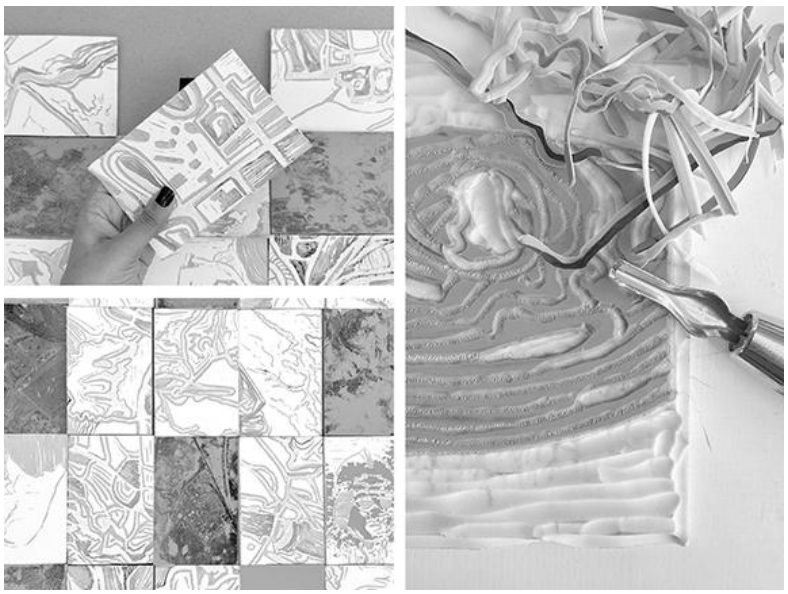

Figure 2. The subtractive process of Lino cutting was used as a technique to document the extractive scars on the Navajo reservation caused by mining.

THE LINGERING EFFECTS OF MINING

Although the uranium mines have long ceased operations, contamination persists, affecting generations. The Radiation Exposure Compensation Act (RECA) of 1990 aimed to address the devastating consequences of environmental racism, yet its impact reveals a deeper struggle. While cleanup efforts and financial compensation have helped, the reality is far more unsettling. For many, restitution barely covered hospital bills, transportation, and legal fees—only to ultimately pay for a casket. One widow's grief encapsulates this injustice: through tears, she wished her husband had

never worked with uranium and pleaded for the government to rebuild homes free from contamination.[5] Three to four generations of Dine communities have lived under the specter of uranium, affecting their families, homes, and sacred practices, an atrocity they came to see as a wound inflicted upon themselves. I questioned why these communities blamed themselves when, in reality, corporations had concealed the dangers of uranium mining. Resources like The Navajo People and Uranium Mining (2006) and oral histories became invaluable, revealing the deep trauma mining inflicted—not just on the land but on the Navajo people's collective psyche.

The intersection of uranium mining and Indigenous mythology underscores the entanglement of environmental exploitation, cultural identity, and ancestral knowledge. In Navajo tradition, monsters symbolize obstacles that must be named to be overcome. Uranium, known as *leetso*, echoed a reptilian creature both in name and form—veins of yellow rock hidden underground. Metaphorically born with the discovery of radioactivity in 1896, *leetso* grew unchecked, with the Navajo people extracting over 13 million tons of ore between 1945 and 1988, unwittingly unleashing a force that would devastate their lands and communities. Blasting through rock ridges unearthed more than minerals—it awakened ancient serpents, monsters from time immemorial, rising from the depths as radioactive contamination.[6] This act defied sacred knowledge, violating ancestral warnings passed down for generations and traditional teachings that cautioned against disturbing forces best left undisturbed.

Red Water Pond Road Narratives

Within this continuum of the sacred and the profane, I encountered the Church Rock Uranium Mill Tailings Spill of July 16, 1979. This disaster released the largest volume of radioactive waste in U.S. history—94 million gallons—into the land and water.[7] As the impact of the Red Water Pond Road Spill lingers, its consequences are largely overlooked and unaddressed by the government. Efforts to address this issue have often prioritized Western approaches, neglecting the Navajo's deep cultural connection to the land. For example, EPA Region 9 has proposed "voluntary relocation" during cleanup efforts.[8] These interventions—laden with bureaucracy and inefficiency—cause further disruption, turning displacement into a prescribed solution rather than addressing the root of the crisis. Keyanna, a resident of Red Water Pond Road, voiced the anguish of forced removal: "Relocation is losing part of yourself… I feel very tied to this land."[9] Her words encapsulate the profound emotional and cultural connection the Navajo hold to their homeland.

Beyond governmental reports and miner testimonies, oral histories and community-led initiatives within chapter houses preserve these narratives and realizations. These accounts amplify the voices of those affected, underscoring the deep cultural significance of the land and how displacement carries with it an immeasurable loss. Community activism persists, but the absence of accountability—especially from governmental organizations—has left many feeling unseen. A critique of current EPA cleanup and relocation plans[10] underscores this frustration: "We have waited far longer than other communities in the U.S. for this poison to be cleaned up. When is it our turn to feel safe? How many more generations have to wait? To heal ourselves, we need to heal the land." This plea underscores an enduring truth: restoration must begin with the land itself.

Despite these systemic failures, there is resistance. Conversations with residents and indigenous literature reveal their optimism. Their collective vision seeks to balance immediate actions with long-term goals, acknowledging the interconnectedness of past, present, and future generations. An example of this, is when students from the University of New Mexico[11] proposed off-the-grid solutions within the reservation—alternatives that honor the Navajo worldview, which sees the Earth as sacred, like a mother.

As I researched further, I was inspired by existing graphic novels like Gamma Goat,[12] shown in Figure 3, that educated the Navajo community and warned children about uranium contamination in the late 1990s. This led me to ask: How can speculative graphic novels reimagine remediation? How can visual storytelling serve as a tool for activism, challenging dominant narratives and envisioning justice through an Indigenous lens? How can I, as an outsider, present my findings in a way that invites interpretation rather than making definitive claims?

Figure 3. The Environmental Protection Agency created a comic book to educate children about the dangers of abandoned uranium mines, mills, and waste in the Navajo Nation.

THE GRAPHIC NOVEL: PROCESS AND TECHNIQUE

Since storytelling is central to Navajo culture, I drew inspiration from various precedents to derive the technique in which I formulated my graphic novel. The delicate landscape linework of Entropy (2018) by Aaron Costain,[13] the subtle color emphasis in Vivre à Frandisco (2018) by Hasselt & Schmitz,[14] and the atmospheric quality of 100 Days in Uranium City (2018) by Denommé.[15] Additionally, I was drawn to the digital glitch motifs in A Girl Called Echo Vol. 2: Red River Resistance (2019) by Vermette[16] to depict temporal distortions.

Using a hybrid approach—hand drawing, photomontage, and rendering—I sought to convey the coexistence of multiple truths, something my Professor Chris Cornelius fondly reiterated. Excerpts from the graphic novel developed during the process are shown in Figure 5. The novel assembles technical references from EPA reports, oral histories, speculative interventions, and archival research, mirroring the act of uncovering and reassembling histories. Just as the story navigates between reality and speculation, the visual language embodies this tension, weaving together fragmented realities.

Yellow permeates the novel—not just as color, but as stain, smudge, and radioactive specter that grows in intensity. It symbolizes the insidious spread of uranium contamination, implicating the reader in the narrative. The motif recalls a foundational Dine mythology —the choice between yellow corn and yellow stone (uranium), where selecting the latter was believed to bring destruction. This cultural belief in self-inflicted danger created an additional psychological and social burden, requiring unlearning before seeking justice and reparations. Through this visual and narrative layering, the graphic novel becomes a tool for reckoning with these histories while imagining new possibilities for remediation and healing.

This ongoing struggle, punctuated by temporal ruptures and glitches in time, unfolds through the voices of Bertha and Messa, the two protagonists whose recollections become both testimony and tool—allowing me to navigate the generational echoes of uranium mining's devastation. Another avenue to show temporal transformation is through the utilization of technology. Google Maps becomes more than a cartographic anchor; it traces their journey along the arroyo, mirroring the path of the annual Walk of Remembrance[17] and the river that once carried radioactive tailings in the wake of the 1979 spill (Figure 4). By weaving between these scales and times, I emphasize the spill's vast reach—extending beyond reservation borders, challenging the illusion of containment, and exposing the fallacy of human-imposed boundaries in the face of water's relentless flow.

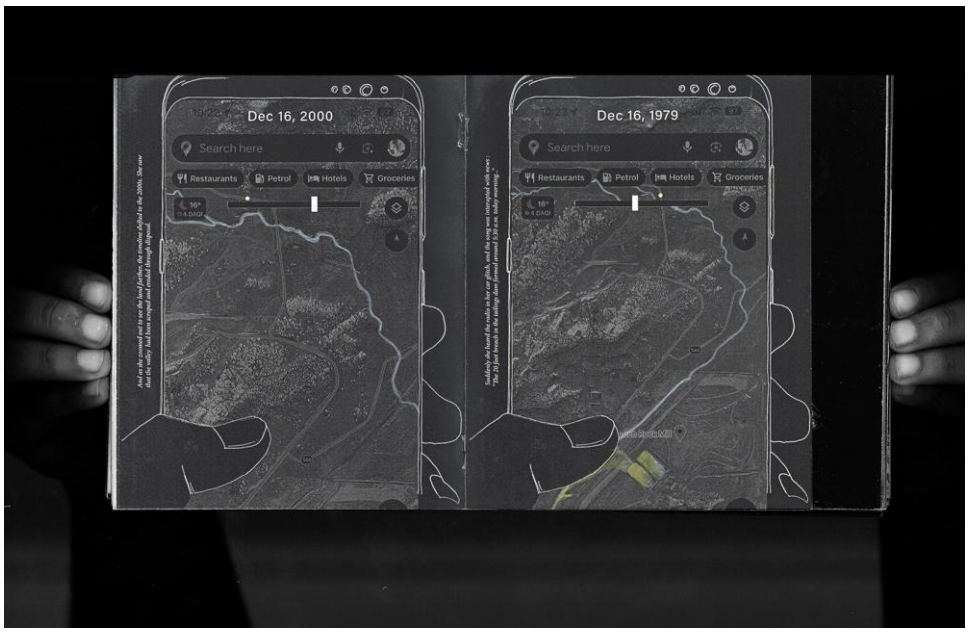

Figure 4. Time lapse of Spill and glitch in time.

In addition to this, oral histories form the spine of this narrative, carrying lived experiences across generations, ensuring that collective memory endures. Though the novel may read as speculative, the integration of phytoremediation and mycoremediation as healing practices aligns with Navajo traditions—offering a way to reintroduce ceremonial plants lost to contamination.[18] Here, remediation is not reliant on heavy machinery but rather on embodied, low-tech interventions where hand and body become instruments of repair. By integrating Indigenous viewpoints and techniques, the graphic novel aims to spark dialogue, raise awareness, and inspire youth to dream of new approaches to remediation. It moves beyond the question of how technology and media have influenced design and architecture, instead using a futuristic lens rooted in ancestral identity to propose alternative solutions.

This continual act of restoration is also the foundation of the research institute conceptualized in the novel—a space that traces contamination and remediation, serving as both a memorial and a sanctuary. In doing so, the community's vision of a "Hózhó" center shifts from a distant aspiration[19] into an experiential reality for the reader. Similarly, the speculative design project at UNM designed by the students, serves as the protagonist's home, reinforcing the notion that displacement was never inevitable—implying that alternative futures are not only imaginable but entirely possible.

Writing the Temporal Narrative: Synopsis

The graphic novel's chapters unfold in a nonlinear sequence, with each one flowing into the next through moments of reflection, and discovery. The stories draw on both historical and speculative elements, using the physical landscape as a canvas for the emotional and environmental struggles of the characters, Mesa and Bertha. Since it was spiral-bound, the chapters can be read independently and revisited repeatedly without a fixed beginning or end—each chapter remains interconnected despite the non-chronological structure.

The first chapter of one sequence begins with a tale shared by Bertha, who braids Mesa's hair as they prepare to leave their home. Bertha narrates an ancient story of the desert where the Coyote, motivated by greed, seeks to exploit the land's yellow dirt. The Five-Fingered People, protectors of the land, resist this greed by sharing the power of stories with Coyote's offspring. The young Coyotes, moved by these tales, join the people to protect the desert, highlighting the power of unity and storytelling over material desire.

As Mesa and Bertha drive toward their destination, Bertha reflects on their community's relocation, the result of an EPA mandate to move them to Gallup. The new settlement, built with sustainable technologies like rainwater harvesting and renewable energy, reflects the community's resistance to forced relocation. This relocation allows them to preserve their way of life and honor their heritage while adapting to modern solutions. Their collaborative efforts with the University of New Mexico (UNM) and the Indian Design and Planning Institute (IDPi) led to the creation of this settlement, blending tradition with sustainability.

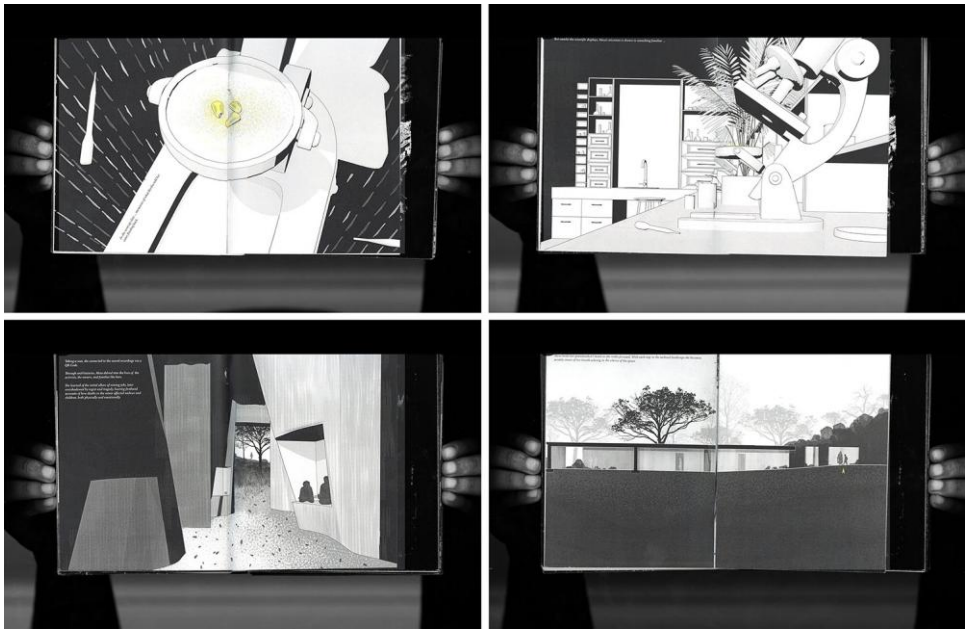

Figure 5. Excerpts from graphic novel done by author.

Upon reaching their destination, Mesa observes the impact of uranium mining on the landscape, particularly the Kerr-McGee and United Nuclear Corporation mines, where the physical toll of the work is visible on the miners. As they carry uranium dust back to their homes, the community faces both direct and indirect exposure to the toxins. Mesa also uses Google Maps to view the changes in the Puerco River, where the river's contamination and the resulting impact on Gallup are traced back to the 1979 mining tailings disaster, which becomes a key point of reference throughout the story.

The novel explores the notion of Hozho, or balance, through the space Mesa and her grandmother enter—an interstitial threshold between the past and present, between the physical world and a space

of knowledge. The lab they enter embodies a place of both remembrance and action, where stories and history are preserved and shared. The atrium in the lab serves as a gathering place, a space where the community comes together to learn from past tragedies, particularly the mining-related illnesses and environmental damage.

As Mesa continues her journey through the lab, she discovers the oral history archives where fellow youth engage with stories of their ancestors' experiences. Mesa learns about the historical context of uranium extraction and its devastating consequences shared by widows. Amidst the scientific displays, Mesa's gaze falls upon something deeply familiar—a yellow corn kernel. Understanding its cultural significance to the Diné way of life, memories rush back of the story Bertha had shared earlier.

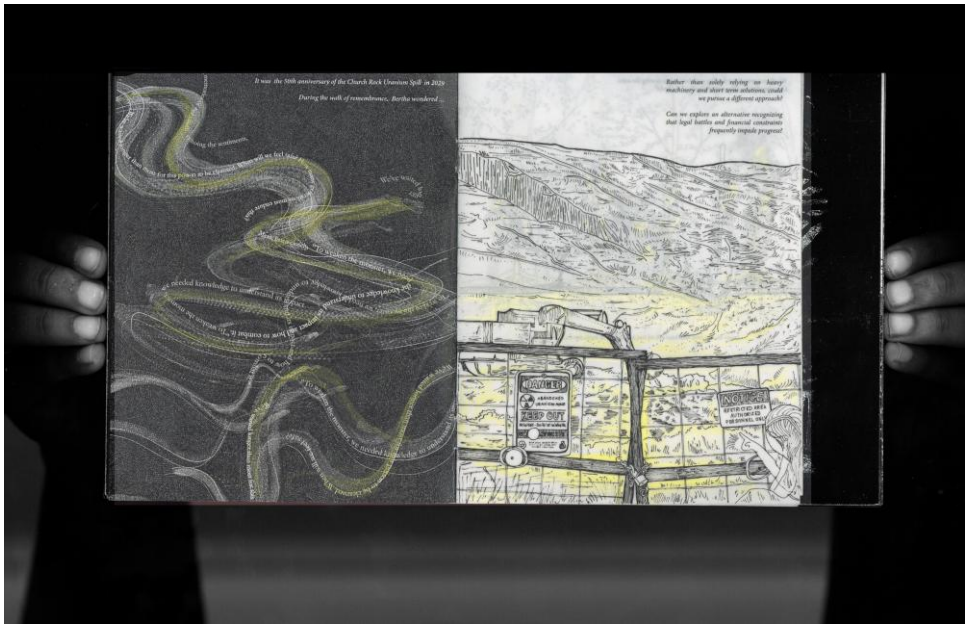

Figure 6. Leethso being unleashed upon Red Water Pond Community.

In a flashback, Mesa recalls the moment when the Navajo people were presented with a choice between two powders: yellow dirt, containing uranium, and sacred corn pollen. They chose the corn, and the Gods warned them to leave the yellow dust undisturbed, for removing it would unleash great harm upon the land (Figure 6). The Dine people's spiritual teachings had long recognized the dangerous nature of *Leethso* (uranium), symbolized by the "snakes" or "monsters" that emerge from the earth when disturbed.

A pivotal moment in the novel comes as Mesa walks out of the lab into the landscape, where scientific research into phytoremediation and microorganism-based solutions to uranium contamination takes place. This section explores the tension between modern scientific methods and ancestral practices, suggesting that healing the land is not merely a technological endeavor but also a spiritual and cultural one. The community seeks to repair the land not just through machines, but through rituals, ceremony, and stewardship, reclaiming harmony with nature.

The remediation efforts are showcased in the novel as Mesa and Bertha walk through the landscape that has been transformed through these initiatives. Healing plants and ceremonial crops grow in newly tested soil, and Mesa participates in the planting ceremony, symbolizing the community's commitment to the land and their ancestors (Figure 7). This act of planting is a gesture of both renewal and resistance, an attempt to heal the scars left by extraction.

The novel concludes with a reflection on the passage of time, as Mesa walks through the now-thriving landscape, guided by the teachings of her grandmother. The landscape, once ravaged by uranium contamination, is now a symbol of regeneration, as flora and fauna flourish. Bertha's voice echoes in Mesa's mind, reminding her that true healing comes from restoring balance to both the land and the people. The community's efforts to create a future grounded in harmony—*Hozho Nashaadoo*—serve as a powerful testament to resilience, cultural preservation, and the ability to heal through collective action.

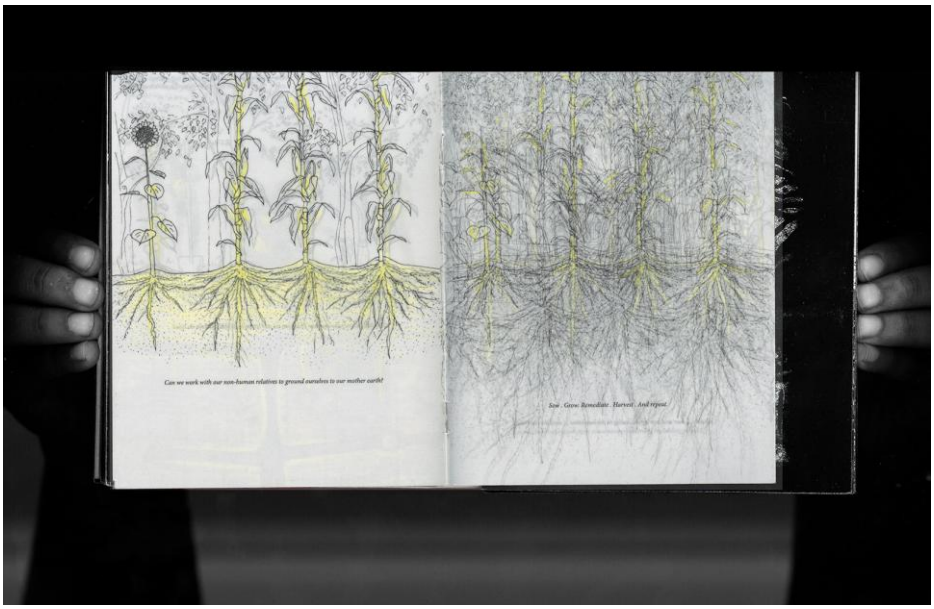

Figure 7. The regenerative practice of honorable harvesting within phytoremediation.

CONCLUSION

Parrin[20] asserts that science and law progress at a deliberate pace, often disconnected from the urgency of pressing issues, without fully grasping their broader impact on communities. Similarly, the novel is a critique on how external agencies, from the EPA to funding bodies, often marginalize cultural values in their remediation and relocation efforts. At its core, this project is an attempt—however imperfect—to reconfigure research into a form that more meaningfully serves the community, providing a means to visualize alternative futures while equipping community leaders with tools to advocate for their needs within governmental institutions.

From the outset, I wanted this graphic novel to be something that could be given back to the community. Kayla Jackson from the Round Rock community—my primary contact during our studio's Kinne travel week—underscored the importance of reciprocity: "There is a need to give back to the community and show that you have done your part since the community has shared their experiences and stories with you." This project is not an act of extraction but one of mutual engagement and continued dialogue.

Having been awarded the Kinne Travel and Research Fellowship[21] for this graphic novel in 2024, the next phase of this research envisions collaboration with organizations such as the Indigenous Design and Planning Institute (iD+Pi), Diné College's Uranium Education Program, and the Reframing Indigenous Remediation team. These partnerships will help further develop the novel and facilitate the distribution of printed copies within the communities most affected. This work is not merely about

documenting history but about activating it—interrogating injustices, framing them within historical narratives, and imagining futures that inspire agency, not just within this community but beyond.

The graphic novel, both as a tangible artifact and a storytelling practice, functions as a means of resistance and a tool for reclaiming narratives that have long been suppressed. Through the process of creating this work, I came to see my role expanding beyond that of a designer, evolving into that of a researcher, illustrator, and perhaps even a vessel—one that holds and retells these narratives with care and responsibility. As an outsider, I have become increasingly conscious of the limitations imposed by non-Indigenous epistemologies, recognizing the need for methodologies that honor Indigenous ways of knowing, storytelling, and memory. By interlacing past, present, and speculative futures, this novel does more than recount loss—it constructs a space where remembrance and repair converge, where land, memory, and healing are woven together in a continuous act of reclamation.

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PRESERVING HERITAGE AMIDST TECHNOLOGICAL ADVANCEMENTS: A MIXED-METHOD APPROACH

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INTRODUCTION

Culture helps preserve identity; history and traditions through the preservation of cultural heritage. The conservation of cultural heritage is crucial for safeguarding those societal aspects including helping to document the historical narratives and protect the traditions However, fast-advancing digital technology has created both new opportunities and enormous challenges in this field. With digital innovations transforming numerous domains, heritage conservation arrives at a critical crossroads, one was sustaining the equilibrium between adopting technology and continuing traditional preservation methods becomes incredibly important. Cultural heritage preservation helps to conserve the essence of society, retain important historical narratives, and protect the most valuable traditions.[1]

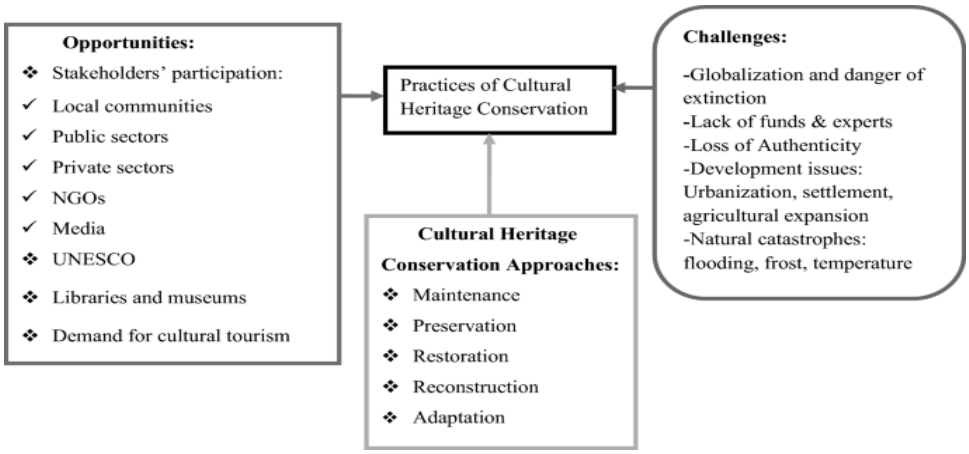

Figure 1. Practices and challenges of cultural heritage conservation in historical and religious heritage sites[2]

Contemporary technology plays a pivotal role in preserving ancient sites while maintaining their authenticity. By integrating digital tools and methodologies, heritage conservation can be enhanced without compromising the historical integrity of these sites. While digital techniques like digital archiving, photogrammetry, and 3D modeling offer new opportunities for documentation and

restoration, they also raise questions about possible effects on cultural heritage integrity.[3] By adopting a mixed-method approach, this study investigates the intersection of technology and heritage conservation. This paper utilizes both qualitative and quantitative methodology to provide a comprehensive understanding of the implications of digital interventions in heritage preservation.

Heritage Preservation and Authenticity

The narrative of authenticity in the conservation & preservation of heritage underlines the complex feature of heritage which encompasses tangible and intangible values. Several research has been conducted in the past to validate this assertion, a landmark research in this domain is that of Laurajane Smith – which her findings emphasized on the complexity surrounding authenticity and also highlighted that community engagement, historical perspective and tourism dynamics all have a major influence on the authenticity of historical and cultural values. She further challenges the overdependence of technology which in turn, diminishes cultural meanings. In a similar vein, Warner raised concerns regarding the over dependence in safeguarding the authenticity of historical and cultural value which has brought in a contradiction. Digital technology is a blessing in disguide as it requires a lot of adjustment to preserve authenticity and integrity within initiatives related tp conservation and preservation of cultural initiatives.[4]

Digital Technologies in Heritage Conservation

Emerging technologies in the spectra of digital documentation includes photogrammetry & 3D modeling has had a huge impact on the preservation landscape of cultural heritage. They enhance the accuracy of records related to heritage which provides detailed, 3D representation of artifacts and structures to facilitate a thorough understanding of conservation efforts. These technologies enable a comprehensive analysis and reconstruction of digital artifacts which therefore augments restoration efforts. The effectiveness is dependent on its application and the knowledge and expertise of the specialists responsible for the conservation. Furthermore, another scholar explored digital tools for the purpose of heritage preservation and this further highlights their potential to allow access to culture while also acknowledging the weaknesses and challenges that comes with the reality of digital divide. These technologies can improve public engagement with cultural heritage, but disparities in access and digital divide may hinder certain communities from benefiting. This reality has been validated in numerous studies that examine the intersection between digital tools and cultural heritage.[5]

Public Engagement and User Experience

The application of visualization technologies for immersion has experienced an increase in the reality of heritage conservation. The capacity of digital simulations to engender experiences that resonates with emotional experience therefore enhances the public's engagement with cultural history. However, scholars also warn against the elevation of technological appeal at the expense of historical veracity. These technologies are being used more in heritage conservation, which gives room for creative means of introducing the public to cultural history. Furthermore, other research has demonstrated that digital simulations can be utilized to create experiences that would have a positive effect on the emotion of the user. Users can experience historical and cultural settings with the help of virtual reality, augmented reality and 3D modeling and this further reinforces connection to the past. Using VR to view ancient ruins or lost artifacts for example can provide a feeling of immediate feel of past and that provide modern viewers to relate with the reality of history. This connection has the potential to increase the support of the public for initiatives related to conservation which further foster a deeper respect for cultural property.[6] In a similar light, John H. Jameson emphasizes the implications associated with digital heritage and advocates for the utilization of technology that

honors the legal and cultural significance of historical sites. He contends that the legal and cultural relevance of historical sites must be respected while using technology for heritage conservation. Intellectual property rights, indigenous populations' rights, and the possible effects of digital access on physical locations are a few examples of these factors.

METHODOLOGY

This research adopts a mixed methodology leveraging on both primary and secondary sources of data to have a clear cut comprehension of how the research subjects is being shaped by technological interventions in the context of historical and cultural preservation. Primary sources of data in this study include survey responses from a wide range of specialists, including technologists, historians, architects, and conservation professionals. Secondary sources on the other hand include archival materials and other relevant literature containing authoritative information in line with the study. Both subjects aims to achieve one set goal – to learn about opinions and views as regards to incorporating digital tools with conventional techniques for the sole aim of historical and cultural preservation.

The adoption of this crisscrossed methodology of both quantitative and qualitative will offer a a comprehensive, human-centered comprehension of the potential and difficulties in conserving our common heritage. The variables for data collection from both subjects includes the effectiveness of digital tools in heritage conservation, effectiveness of digital tools in architectural conservation accuracy of digital tools in capturing material qualities, comparison of digital and traditional methods in conservation, impact of BIM on project planning in architectural conservation, cost and time efficiency of digital conservation tools and the role of digital tools in public engagement and heritage education. Furthermore, the study will incorporate a user experience (UX) assessment to learn how users engage with these digital representations which would hence investigate how visitors react emotionally to the digital tools, how user-friendly they are, and whether they effectively foster a sense of connection to the cultural material being showcased. Combining these methods, the study seeks to offer a thorough grasp of how digital advances might improve public participation and cultural preservation.

The data analysis will employ a deliberate, two-pronged strategy. To discover important themes that arise from their experiences and viewpoints, thematic analysis will be employed to reveal recurrent patterns and insights in the qualitative data collected from the analyzed secondary sources. On the other hand, survey data will be examined through statistical techniques to uncover more general patterns in the public's and professionals' perceptions of digital heritage technologies leveraging on charts and descriptive narratives which would be further triangulated to provide a fair assessment of what works and what doesn't in this developing field, illuminating both effective tactics and possible difficulties in integrating technology with conventional conservation techniques.

RESULTS & DISCUSSION

The data gathered from expert questionnaires, analyzed quantitatively and validated qualitatively will provide important insights into the effectiveness, challenges, and prospects of digital tools in conservation efforts. The study's findings offer a thorough assessment of the role of digital technologies in heritage preservation, particularly in striking a balance between technological advancements and architectural authenticity. Measurable trends about the efficacy of digital technologies were probably found by the quantitative analysis of the questionnaire data.

Effectiveness of Digital Tools in Heritage Conservation

The findings of the survey highlights that digital tools such as photogrammetry, BIM, and 3D modeling are increasingly valued in architectural conservation. Surveys reveal most professionals consider these technologies "very effective" or "somewhat effective," reflecting their growing role in transforming how cultural heritage is documented and preserved. Key advantages include faster restoration workflows, easier access to heritage data from afar, and the creation of precise, durable records.

Yet despite their strengths, some experts argue against relying solely on digital solutions. While these tools deliver remarkable accuracy, they may fall short in scenarios requiring nuanced human judgment. Traditional craftsmanship and hands-on expertise, for example, remain essential when restoring intricate carvings, delicate textures, or culturally symbolic elements. This tension underscores a broader truth: successful conservation often hinges on blending innovation with respect for context. Historic sites carry layers of cultural meaning that machines alone can't interpret, demanding a collaborative approach where technology supports—rather than replaces—the irreplaceable insight of skilled artisans.[7]

Take handcrafted details or locally sourced materials: these elements often embody techniques passed down generations, demanding a tactile understanding no scanner can replicate. Similarly, a site's historical significance might involve stories or traditions that shape how restoration should unfold. In such cases, digital tools serve as powerful aids, but the human touch—guided by experience and cultural sensitivity—steers the process. Balancing these approaches ensures preservation honors both the physical structure and the legacy it represents.

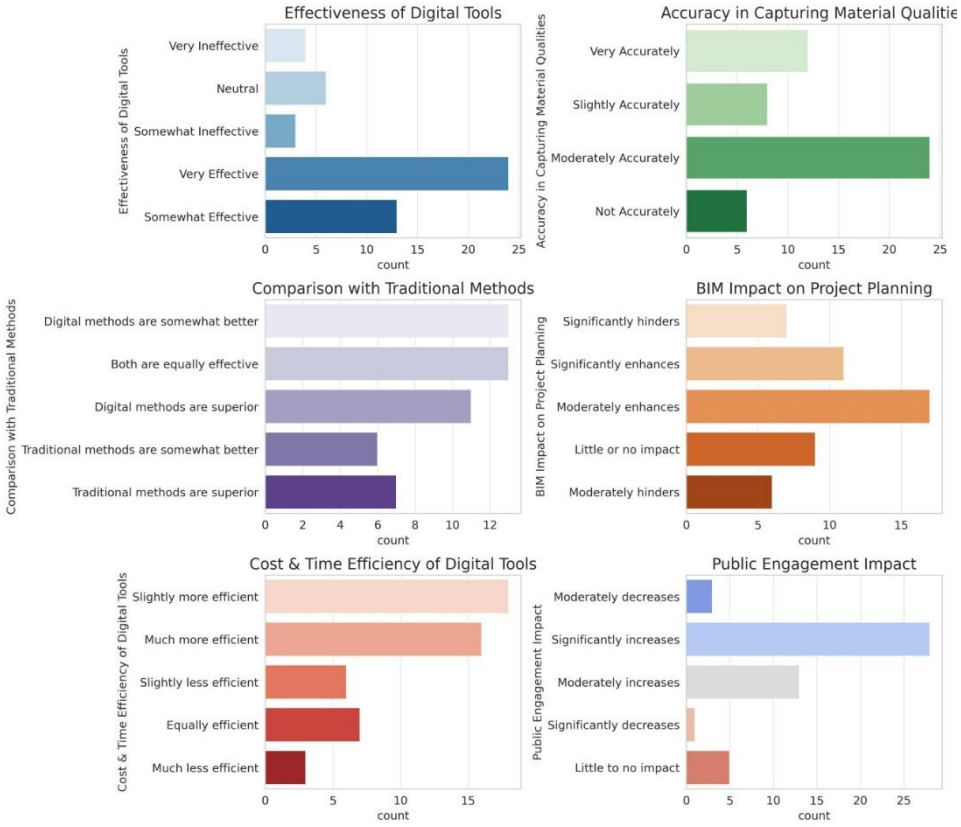

Figure 2. Field Results (Author, 2024).

Effectiveness of Digital Tools in Architectural Conservation Accuracy of Digital Tools in Capturing Material Qualities

Capturing the unique material qualities of historic structures—such as texture, aging effects, and signs of decay—is vital for effective digital conservation. While tools like photogrammetry and laser scanning excel at creating high-resolution structural records, the study reveals a recurring challenge: many practitioners rate their ability to replicate subtle material details as only "moderately accurate." For instance, surface nuances like weathered patina or time-worn textures often elude digital capture, despite advancements in scanning precision. This gap poses a dilemma for conservationists, as these material characteristics are critical for guiding restoration choices. A weathered stone's erosion patterns or a faded mural's original pigments, for example, may hold clues about a structure's history that digital renderings struggle to convey. While AI-enhanced modeling and improved material simulation could address some limitations, the research emphasizes that digital tools alone aren't yet sufficient. To bridge this divide, experts advocate pairing digital documentation with hands-on analysis—such as physical material testing and site visits—to ensure restorations honor both structural integrity and historical authenticity. In essence, the study underscores a need for balance: digital innovation offers unparalleled efficiency in mapping and preserving heritage structures, but the irreplaceable human eye—attuned to context, material subtleties, and cultural significance—remains key to meaningful conservation.[8]

Comparison of Digital and Traditional Methods in Conservation

The results show that there is still disagreement about whether digital or traditional methods are better for architectural conservation, with many respondents considering digital tools to be somewhat better while others continue to stress the value of old methods. The discourse on balancing innovation and authenticity in heritage preservation highlights the tension between traditional craftsmanship and contemporary methods. While traditional techniques are valued for their ability to maintain both physical and intangible heritage, innovative approaches can enhance engagement and sustainability. This balance is crucial for the future of cultural preservation. Digital documentation methodologies, including laser scanning and Building Information Modeling (BIM), substantially augment the accuracy and flexibility of conservation methodologies. These advanced technologies not only support the formulation of adaptive conservation strategies but also guarantee the preservation of historical veracity. The synthesis of conventional and digital approaches is imperative for efficacious heritage conservation, as substantiated by numerous scholarly investigations.[9]

The Impact of BIM on Project Planning in Architectural Conservation

BIM has emerged as a key asset in heritage conservation, with most practitioners describing it as "moderately" to "considerably useful" for planning restoration projects. Its strength lies in creating data-rich 3D models that allow teams to simulate restoration outcomes, assess structural stability, and streamline workflows—aligning with studies that praise BIM's potential to boost efficiency and informed decision-making. Yet applying BIM to historic sites isn't without hurdles. Many heritage structures feature irregular geometries, hand-carved details, or asymmetrical designs that resist standardized digital modeling. For example, a Baroque-era facade with intricate stonework might require laborious manual adjustments to BIM templates, slowing down processes meant to save time. This gap highlights the need for more adaptable Heritage BIM (HBIM) frameworks tailored to the quirks of aging architecture. While BIM undeniably enhances project coordination and documentation, its limitations underscore a recurring theme in conservation: technology works best when paired with human expertise. Future advancements in HBIM could focus on integrating AI to better interpret non-standard features, but for now, practitioners stress that BIM should complement—

not replace—the meticulous on-site assessments and artisanal knowledge that define authentic preservation. Success lies in merging BIM's precision with the flexibility of hands-on craftsmanship.[10]

Cost and Time Efficiency of Digital Conservation Tools

Empirical data underscores the transformative role of digital technologies in enhancing the cost and temporal efficiency of architectural conservation initiatives. A majority of surveyed practitioners characterize these tools as "much more efficient" or "slightly more efficient" relative to conventional methodologies, corroborating prior studies that attribute such gains to streamlined data acquisition, reduced reliance on labor-intensive processes, and real-time interdisciplinary collaboration. For instance, digitized workflows—encompassing photogrammetric surveys and cloud-based documentation platforms—enable rapid, non-invasive site assessments, curtailing project timelines while minimizing physical interventions.

Nevertheless, this efficiency is tempered by critical trade-offs. Accelerated digital modeling, though advantageous for budgetary and scheduling objectives, risks oversimplifying material and historical nuances. Subtle features such as weathering patterns, artisan tool marks, or layered pigment degradation—integral to authentic conservation—may elude automated detection, necessitating supplementary manual analysis. Furthermore, while digital tools promise long-term fiscal benefits, their adoption imposes significant upfront financial burdens, including specialized software, high-resolution scanning hardware, and technical training. Such costs may disproportionately constrain smaller-scale projects or institutions with limited resources, exacerbating inequities in heritage preservation capacity.[11]

These findings advocate for a balanced methodological framework wherein digital efficiency is harmonized with meticulous, context-sensitive evaluation. The study posits that while computational tools optimize resource allocation and procedural coherence, their application must be calibrated to prioritize material integrity and historical fidelity. As such, practitioners are urged to integrate digital workflows as complementary components within a broader conservation strategy—one that judiciously pairs technological innovation with traditional empirical scrutiny to ensure both operational efficacy and scholarly rigor. Future research should explore scalable solutions to mitigate initial investment barriers while advancing algorithmic precision in capturing culturally significant material attributes.

The Role of Digital Tools in Public Engagement and Heritage Education

Empirical evidence highlights the transformative capacity of digital tools to amplify public engagement and pedagogical outcomes in architectural conservation. Survey data reveals a consensus among practitioners that these technologies significantly enhance societal interest in heritage preservation, underscoring their dual utility as instruments of education and participatory advocacy. This aligns with interdisciplinary studies demonstrating how immersive platforms, such as augmented reality (AR) and virtual reality (VR), foster novel modes of interaction with cultural heritage, transcending geographical and physical barriers. By enabling remote access to meticulously reconstructed digital surrogates of historical sites, these tools democratize cultural appreciation, particularly for audiences constrained by mobility, economic limitations, or geopolitical boundaries.

However, scholars caution against uncritical adoption. While digital visualizations can enliven public discourse, their design necessitates rigorous scholarly oversight to mitigate risks of historical distortion or commodification. For instance, hyper-stylized renderings or gamified interpretations may prioritize aesthetic appeal over historical fidelity, inadvertently eroding nuanced narratives. To address this, researchers advocate for frameworks that position digital heritage technologies as

pedagogical instruments rather than mere spectacle. Such approaches emphasize the integration of conservation ethics, material authenticity, and contextual historiography into interactive platforms, ensuring public engagement aligns with scholarly rigor.[12]

The findings propose a paradigm wherein digital tools serve dual mandates: as dynamic interfaces for experiential learning and as catalysts for critical dialogue about preservation ethics. By embedding metadata on conservation methodologies, material degradation, or sociohistorical contexts within digital models, these platforms can cultivate public literacy in heritage stewardship. Future development should prioritize interdisciplinary collaboration between technologists, historians, and conservators to balance innovation with accountability, ensuring digital interventions enrich—rather than simplify—the public's understanding of cultural heritage's complexity.

CONCLUSION

This research has validated the potential of digital technologies in transforming the associability with architectural, historical and cultural conservation in the context of documentation, planning and stakeholders engagement in the preservation of heritage. The findings further revealed that these technologies like BIM, 3D Modelling and photogrammetry are regarded as effective and are indeed efficient in capturing details of structures and materials, workflow streamlining and ensuring the accuracy and authenticity of heritage projects, which further necessitates a complimentary value in costs and time saving. The study also highlights the value of digital tools in enhancing public engagement and heritage education, demonstrating their role in fostering greater accessibility and appreciation of cultural heritage. However, the successful implementation of these tools requires addressing barriers such as high initial costs, technical expertise, and the adaptation of digital workflows to the complexities of historical structures. Barriers like high upfront expenditures, technical know-how, and the need to modify digital workflows to account for the intricacies of historical architecture must be addressed for these solutions to be implemented successfully.

Ultimately, this research emphasizes the need for a balanced approach that leverages the precision and efficiency of digital technologies while preserving the cultural and historical significance inherent in traditional conservation methods. Future research should focus on refining digital tools for heritage-specific applications, fostering interdisciplinary collaboration, and developing policies that support the integration of innovative technologies in conservation practices. By doing so, architectural conservation can achieve a sustainable and inclusive future, ensuring that heritage sites are preserved for generations to come.

NOTES

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LESSONS OF DONALD JUDD FOR UBIQUITOUS COMPUTING

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"A paradox of art is that despite the artist's strange anti-logical existence, his thinking often coincides with and even anticipates major discoveries in science or philosophy."[1]

INTRODUCTION

"Today, the spaces and societies in which we live are infused with media and technology."[2] Today, any corporation, industrial, educational, governmental, or private institution in the West is over-run by institutional enterprise software technologies, instilling data-driven decision-making processes in most of our collective and institutional activities. They manage human resources, financial records, patient data, investment portfolios, compliance requirements, and so on. In our professional environments, employees are managed by the outputs of data-centric enterprise software solutions. In our personal engagements with institutions, we are also managed by software. It is almost impossible to speak to a person during a transaction with a large corporation. We are sent from a website to a FAQ page, to a chatbot, and on goes the cycle. This is easier to comprehend in the context of financial transactions, where the sole purpose of the software is to sell products or services, and cost-saving and profit are the only motivators. However, in the context of our professional environments, it is harder to decipher the effects of enterprise software. It works through homogeneity. Everything must be the same, so that it can recognize difference. Every employee must be seen to have the same characteristics, so that the HR software can distribute the annual raises, or present who needs to be fired, or promoted. Nuance and qualitative judgement are absent. There is clearly value in this approach. There are places where we want homogeneity and repetition for ease and efficiency. We also need to rely on data for qualitative judgements. But we need to decipher the limits and the ill effects of this homogeneity, so that we can interrupt it at the right moment. Nuanced discernment is where enterprise computing fails, and we need to develop ways to disrupt its institutional ubiquity. Where best to look for clues of discernment than the arts. Of course, we could look anywhere in the arts for these clues, how qualitative and nuanced discernment occurs. But, given the larger topic of ubiquitous data-driven computing, we propose to examine works of art that partake in serial data, systemic thinking and the repetitive.

In this light, we analyze Donald Judd's 100 untitled works in mill aluminum (Figure 1,)[3] revealing a process driven by systemic shape-data, yet tempered by improvisational moments at key junctures. Judd (1928-1994), one of the most significant American artists of twentieth century, writer, and philosopher, installed 100 aluminum three-dimensional objects—with the exact same outer

dimensions but unique internal configurations, all made from ½" mill aluminum plates—over a four-year period from 1982 through 1986 in two former artillery sheds of a de-commissioned US military base in Marfa, TX.

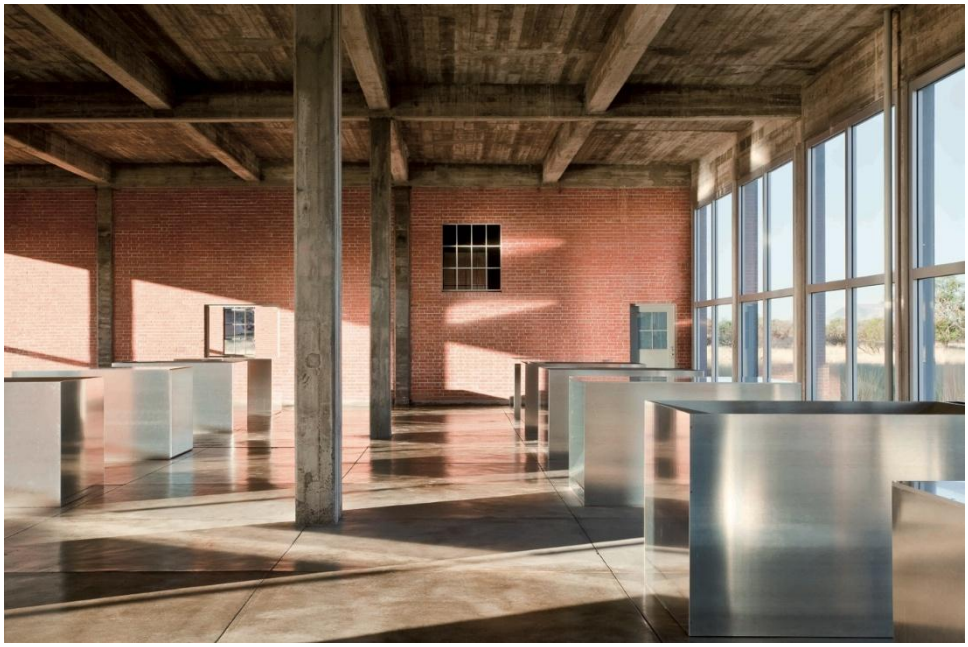

Figure 1. Donald Judd, 100 untitled works in mill aluminum, 1982-1986. Permanent collection, The Chinati Foundation, Marfa, Texas. Photo: Douglas Tuck, courtesy of The Chinati Foundation. Donald Judd Art © 2025 Judd Foundation / Artists Rights Society (ARS), New York.

SERIAL WORKS: COMPUTING WITHOUT COMPUTERS

Artists' artistry has been attributed to the particularity of their execution, in their brush-stroke, the way they frame reality, the plastic modeling of substance in sculptures, and so on. Their discerning judgement would come into play through the craft of their execution. This understanding of artistry as related to execution had been the norm till the nineteenth century. The artists' visions of the world, God, beauty, valor, honor, and truth were singular, one of a kind, un-matched. The order of the work was within itself and to be discovered between the artwork and its referent. In 1872 Julius Wilhelm Richard Dedekind, a German Mathematician, published *Stetigkeit und Irrationale Zahlen*, in which he theorized the continuous independent variable and put in motion works, initially artistic and later computational, that relied on relational logic among works rather than independent and autonomous logic embedded in singular works.

John Coplans, artist, curator, and editor-in-chief of *Artforum*, notes the influence of Dedekind's theories on Claude Monet's *Seven Views of Gare Saint-Lazare* of 1877, produced only five years after Dedekind's publication.[4] Coplans curated an exhibition at the Pasadena Art Museum in 1968, titled "Serial Imagery." In a book of the same title, Coplans traces serial artworks to Monet and the Dedekind-Cantor mathematical theory. In this, he highlights the work of artists such as Monet, Duchamp, Stein, Albers, Reinhardt, Kelly, Warhol, and others who developed serial works that privileged the structure that governed the logic of repetition and variation instead of focusing on the execution and craft of individual works. Serial works were produced with regularity between 1877 and the 1960s, however, the interest in serial works magnified in the decade leading to John Coplans's curated exhibition in Pasadena. A year prior to this exhibition, Mel Bochner, an artist and critic,

published an essay in the December 1967 issue of *Artforum*, titled "The Serial attitude." Together, Bochner and Coplans defined the parameters of what constituted serial works, almost ninety years after the first serial work was developed by Monet. We have analyzed both Bochner's and Coplans's essays elsewhere and have outlined what they share and where they differ.[5] Here, we will briefly mention the three principles that are outlined by both.

1. Bochner and Coplans agree that "the derivation of the terms… of the work is by means of a… systematically predetermined process…,"[6] where a "macro-structure–-that which is apprehended in terms of relational order and of continuity..." governs the relationship among the individual works in the series.[7]

2. Bochner and Coplans also agree that "Serial Imagery is a type of repeated form or structure shared equally by each work in a group of related works made by one artist…" where "order takes precedence over the execution."[8]

3. Bochner and Coplans generally agree that "There is no limit to the quantity of works in a series other than what is determined by the artist…."[9] In distinction from Coplans, Bochner insists that series be self-exhausting, enumerating all the possibilities made available by the macro-structure.

The three principles not only outline what defines serial works of art, but also point to the foundation of computational shape grammars. From this foundation, we see two lineages of work, the computational, which concentrates on the systemic analysis and permutations of data points; and the artistic that focuses on the systemic, yet relinquishes the system to human discernment. Of course, both the computational and the artistic operate on a spectrum that has systemic at one extreme and intuitive at the other. However, we agree that the computational falls closer to the systemic end of the spectrum and the artistic to the intuitive.

COMPUTATION AND SERIALITY

Seriality in art offers a unique framework to explore the intersection of computational design and human discernment. At its core, seriality relies on systematic repetition governed by predefined rules—a foundation that aligns closely with computational methodologies like algorithmic design and shape grammar. However, if we take Donald Judd's 100 untitled works in mill aluminum (Figures 1 and 2) as an example, seriality is not merely a mechanical reproduction of predefined patterns; it is a dynamic interplay between systemic logic and aesthetic decision-making.

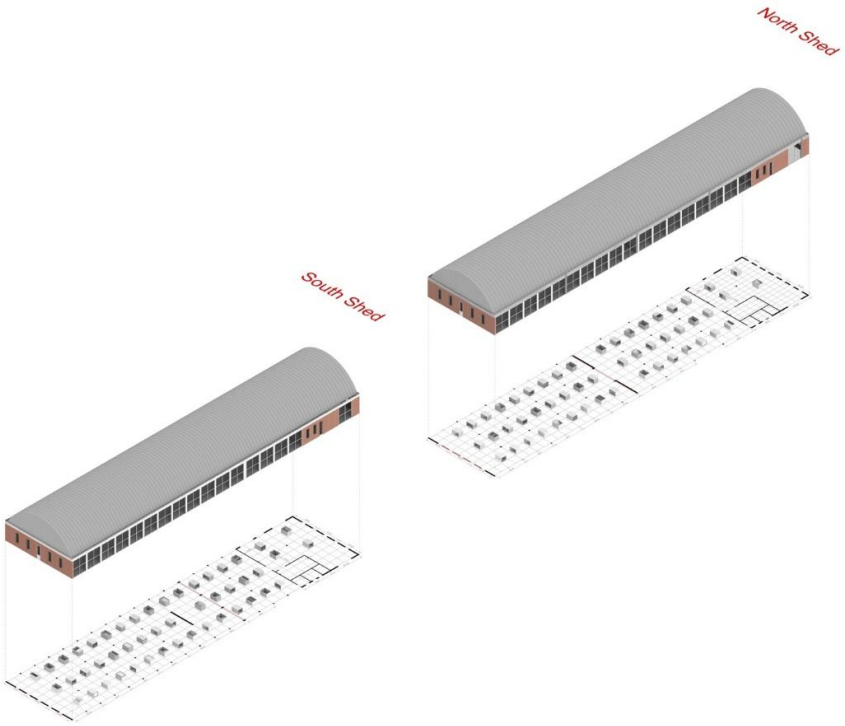

Figure 2. Isometric view of the two artillery sheds with the permanent installation of Donald Judd's 100 untitled works in mill aluminum. The Chinati Foundation, Marfa, Texas. Drawing by authors.

Shape grammar, introduced by Stiny and Gips in the 1970s, formalized a method for analyzing and generating designs based on rules that govern geometric relationships.[10] These grammars operate algorithmically, applying transformations to initial shapes to create structured yet diverse outputs, very much in line with principles outlined by Bochner and Coplans. In 1983, Knight applied shape grammar to analyze artistic evolution, noting how Vantongerloo and Glarner transformed De Stijl painting using a grammar of shapes and rules of permutation.[11] Almost concurrently, Donald Judd installed 100 aluminum objects—all 41"x51"x72", but each with unique configuration, made of ½" mill aluminum—in two former artillery sheds of a de-commissioned military base in Marfa, TX (Figures 1 and 2.) In many ways, Judd's 100 untitled works in mill aluminum can be understood as a manifestation of a shape grammar: the constraints of object dimensions (41"x51"x72"), material type (1/2" mill aluminum), and structural logic (e.g., open or recessed elements) form the base "rules," while each unique piece represents the outcomes of additional aesthetic decisions.

Algorithmic design parallels this process in computational fields, where algorithms encode design intentions, enabling the generation of complex, data-driven forms. For instance, parametric modeling software uses rule-based systems to produce adaptive design systems with clear, rule-based structures for consistency and scalability. While computational tools may exhaustively enumerate possibilities, Judd's work demonstrates the importance of selective interruption—choosing only the configurations that resonate aesthetically.

ART AS AN INFUSION OF SERIAL AND IMPROVISATIONAL METHODS

Serial works of art serve as a bridge between systemic methods such as those used in computational shape grammars and the intuitive methods of work by artists. Among serial artists, Sol Lewitt exemplifies the systemic and methodic end of the spectrum. He puts in motion certain rule or plan and allows it to run its course, fully. It fulfills the first of Bochner and Coplans's principles by adhering to the pre-determined plan, the second by the precedence of order over its execution, and the third by

ensuring the plan runs its course. For example, in his *Incomplete Open Cubes* of 1974 (Figure 3,)[12] Lewitt didactically explores the 122 ways of "not making a cube, all the ways of the cube not being complete."[13] He systematically maps, on a square gridded chart, all the variations that may define a cube without completing it: 3 with three edges, 5 with four edges, 24 with six edges, 32 with seven edges, 25 with eight edges, 13 with nine edges, 5 with ten edges, and 1 with eleven edges. We note that Lewitt's *Incomplete Cubes* arrives six years after Coplans's *Serial Imagery* exhibition and three years after Stiny and Gips's "Shape Grammars" essay.[14] We recognize its adherence to the systemic end of the spectrum. It is, of course, much easier to imagine the improvisational and intuitive end of the spectrum in relation to the arts. That is where we imagine most artists' work to be. For us, of extreme interest to the topic of this essay are the works of art that straddle the systemic and the improvisational, those that partake of the systematicity, yet maintain the discerning human judgement outside the computational, data-based decision-making.

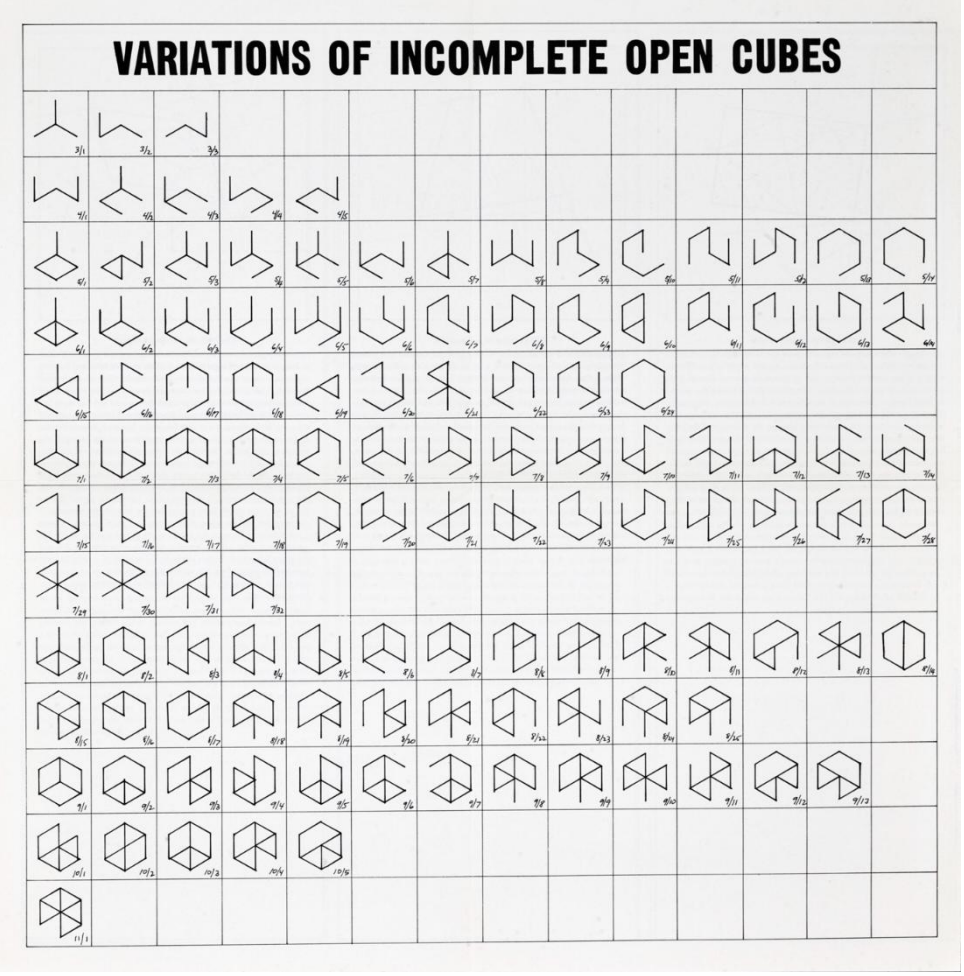

Figure 3. Sol LeWitt, American, 1928-2007. Diagram for "Incomplete Open Cubes," 1974/1982. From an announcement for Sol Lewitt: Wall Drawings and Structures. Wadsworth Atheneum Museum of Art, Hartford, CT. The Lewitt Estate, Artists Rights Society (ARS) New York.

To locate works in this threshold, we return to the two essays by Bochner and Coplans on serial works. In Bochner's 1967 *Artforum* essay, "The Serial Attitude," he mentions Donald Judd's "painted wall pieces" as employing serial logic.[15] In Coplans's 1968 *Artforum* essay, "Serial Imagery," he does not mention Judd at all.[16] In fact, in the book/exhibition catalog mentioned above that included the essay as its main feature, Coplans adds a "history" section to the start of the essay where he notes:

"Although the work of such sculptors as Donald Judd has been described as Serial, this is incorrect."[17] This contradiction between the two key essays that define serial works, attracted our attention, and pointed us in the direction of one of Judd's late works with the largest number of pieces and the highest potential for seriality, 100 untitled works in mill aluminum. John Coplans in a 1971 interview with Judd asked him: "You mean that all your ordering of form is arrived at or deduced as a whole in advance?" In response, Judd said: "Yes, that's what I was going to tell you. You see, the thing about my work is that it is given… You don't walk up to it and understand how it is working, but I think you do understand that there is a scheme there, and that it doesn't look as if it is just done part by part visually. So, it's not conceived part by part, it's done in one shot."[18] This statement confirms Judd's mindset and methods as tending towards the systemic, yet, at the same time, adhering to methods that do not reveal their structure. As a counterpoint and a method of undermining the legibility of systematicity in the work, in a 1990 interview with Claudia Jolles, Judd said: "I just do the possibilities which are the most interesting. I don't want to realize a comprehensive sequence of all the possible solutions. Because usually just some of them are good. Usually I can think of many more possibilities than I can afford to build."[19] We see why Coplans and Bochner placed Judd once within and once without the grouping of serial artists. Clearly he has serial tendencies, but is not fully wedded to the third principle, that of running the system to its exhaustion. He is also not interested in the didactic legibility of the system in his work. Marianne Stockebrand, a Judd scholar, has noted that "Judd avoided any apparent sense of order that would be open to didactic explanation. Instead, he confused matters, although there's method behind the apparent confusion."[20]

What sets Judd apart from purely computational processes is his willingness to disrupt the logic of the system. His rejection of exhaustive enumeration, as highlighted in the interviews mentioned above, reflects an artistic sensibility that resists mechanistic determinism. This tension between systemic generation and human curation mirrors challenges faced in contemporary ubiquitous computing, where data-driven decision-making often suppresses nuanced discernment. By incorporating anomalies or rejecting configurations that are not most, Judd demonstrates a principle crucial for computational design: the necessity of human intervention to temper algorithmic uniformity.

LESSONS OF JUDD FOR UBIQUITOUS COMPUTING

We have conducted extensive analysis of the 100 untitled works in mill aluminum. In Figure 4, you see all 100 objects mapped within structures that govern their formal configuration.[21] Ninety six of the objects relate to source objects. Some source objects generate no object groups, and others as many as six. The structure is also capable of "designing" many more objects than the one hundred produced. Even if we remove all the objects that may appear repetitive or not most interesting, as Judd has referenced, there are still twenty-two objects that could have been made, but were not, marked in red. We also note structures that only produce a few objects, such as "compound," that only produces two, or "closed one end" that only produces three, or "double-closed one end" that only produces one object. These have the potential of producing many iterations. The chart highlights the methodic and systemic thinking behind the pieces, but also highlights many moments where the system is interrupted by Judd in order to instill his discerning sensibilities. We note four objects that are listed under anomalies, that do not even adhere to the largest encompassing structures, such as the three strict categories of "open or recessed top," "open or recessed end," and "open or recessed side" (Figure 5.) In fact, in relation to object number 98 (Figure 6,) one of the objects listed under the category of "anomalies," Don Lippincott of Lippincott, Inc., the fabricator of all 100 objects, wrote a note to Donald Judd comparing this object to "certain primitive art" where they "sometimes interject an unrelated element such as this to 'let the demons out'?[22] Judd consciously inserted an object that defies the logic of the system he invented.

Categories of objects in Donald Judd's 100 untitled works in mill aluminum																										
	Form Types--->	Open or Recessed Top							Open or Recessed End							Open or Recessed Side								Anomalies
Elevation Types--->	Rulesets	Source Object	Offset	Offset-Offset	Double	Offset-Double	Offset-Double-Offset	Compound	Source Object	Offset	Offset-Offset	Double	Offset-Double	Offset-Double-Offset	Closed One End	Source Object	Offset	Offset-Offset	Double	Offset-Double	Offset-Double-Offset	Closed One End	Double-Closed One End	
FULL	Full	1						100	12						67	13						68		
		10							17							18								
		16						26	27							34								
	Full-Oblique	6	77	78	79	43	44		28	30	32		45	47		35	37	39		49	51			
			91						29	72	69		87	76		36	70	73		85	75			
		7	57	58	80	61	62			74			88				71			86				
			92						95							96								
	Full-shape Offset	8							53							55								11
		9							54							56								14
		15																						19
HALF	Half	2			93				25			66				24			65					
		3			94				33			48				40			52			89	90	
		22			63																			
		23			64											97			99					98
	Half-Oblique	4			41				31			46				38			50					
		5			42																			
		20	84		59	82																		
		21	83		60	81																		

Figure 4. Chart mapping all 100 objects in Donald Judd's 100 untitled works in mill aluminum, designated by number, describing the relationship of individual objects with one another and the structures that govern their formal configuration. Red background denotes possible objects that could have been made from the rulesets, but were not made.[23]

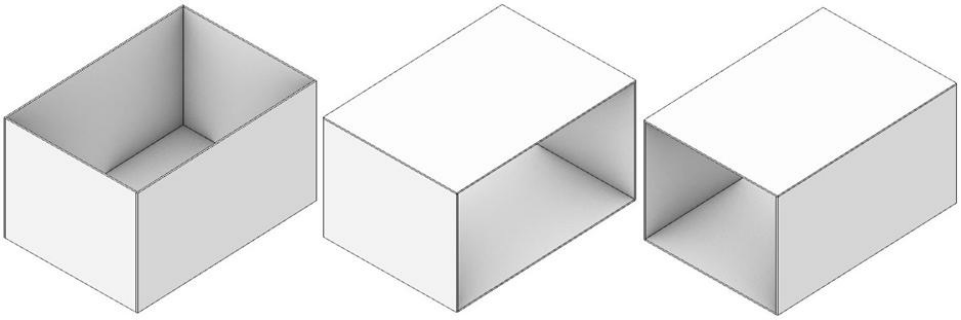

Figure 5. Diagrams of "open or recessed top," "open or recessed side," and "open or recessed end," objects number 1, 13, and 12 (L to R). Diagrams by authors, based on Donald Judd's 100 untiled works in mill aluminum.

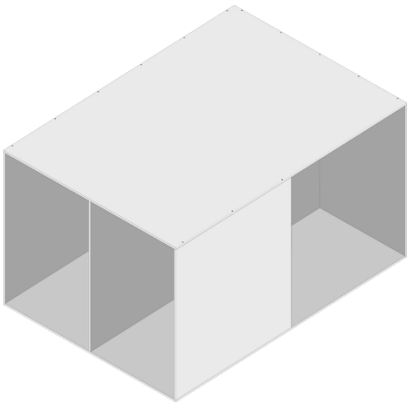

Figure 6. Diagram of object number 98. Diagram by authors, based on Donald Judd's 100 untitled works in mill aluminum.

As enterprise software and algorithmic systems increasingly dominate our professional and personal environments, Judd's approach to seriality offers a critical model for integrating computation with

discernment. Ubiquitous computing thrives on systemic homogeneity—uniform data structures enable efficiency and scalability—but fail when nuanced, contextual decisions are required. The balance Judd achieves between serial logic and aesthetic decision-making underscores the value of a hybrid approach. This hybridization suggests a new paradigm: that algorithmic design systems with clear, rule-based structures for consistency and scalability have embedded within them points for human intervention, allowing qualitative evaluation to influence outcomes.

CONCLUSION

In this brief introduction to the 100 works, we see Judd's adherence to systemic thinking, yet also to the discerning mind of the artist. The 100 untitled works in mill aluminum is undoubtedly one of the most important and significant art works of the twentieth century. Stepping into The Chinati Foundation's artillery sheds where the objects are installed is awe-inspiring and astonishing. It is so, not because it is systemic, rather because of its sensibility and sensitivity to its environment, because of Judd's discerning aesthetics. Judd has achieved this not by adhering to the structure of seriality, but by knowing when and where to break from it and interject a different kind of intelligence. It is the simultaneity of the serial and the intuitive, what we may call computational intelligence with aesthetic intelligence. The formal configuration of the objects may belong to a grammar. However, our experience of them is infused with desert light, reflections, luminosities, un-expected transparencies and opacities, color, and their complex relationship with other objects in the sheds (Figure 7.) In 100 untitled works in mill aluminum, Judd presents us with a model of critical practice, where systematicity and improvisation are constantly questioning one another. Instead of a pure computational model where data-driven computation decides next steps, Judd's model uses aesthetic intelligence to interrupt and question the homogeneity of the serial and its inability to discern. If we were to use Judd's model in corporate and institutional America, we would need leadership that not only enacts policy and enforces practices, but is able to discern when not to do so. We need computation for the collection, mining and analysis of data, but human intelligence for decision-making.

Figure 7. Donald Judd, 100 untitled works in mill aluminum, 1982-1986. Object #53 in foreground. Permanent collection, The Chinati Foundation, Marfa, Texas. Photo: Billi London-Gray, 2010. Donald Judd Art © 2025 Judd Foundation / Artists Rights Society (ARS), New York.

NOTES

[1] John Coplans. *Serial Imagery*. Pasadena, CA: Pasadena Art Museum, 1968, 7.
[2] "Society. Spaces. Screens" conference call for papers. Organized by AMPS (ARCHITECTURE – MEDIA – POLITICS - SOCIETY) December 11-13, 2024.
[3] The project referenced in this paper is Donald Judd's 100 untitled works in mill aluminum, permanently installed at The Chinati Foundation, Marfa, TX. The archival material for Judd's 100 works is held at The Chinati Foundation Archives, and the Judd Foundation Archives, both in Marfa, TX.
[4] Coplans, *Serial Imagery*, 7.
[5] Mahyar Hadighi and Mehrdad Hadighi, "Between System and Improvisation: The Design Language of Donald Judd's 100 untitled works in mill aluminum," in *Computer-Aided Architectural Design: INTERCONNECTIONS: Co-computing Beyond Boundaries*, ed. Michela Turrin et al. (Cham, Switzerland: Springer, 2023), 24-26.
[6] Mel Bochner, "The Serial Attitude," *Artforum* VI 4 (1967): 28.
[7] Coplans, *Serial Imagery*, 11.
[8] Bochner, "The Serial attitude," 28.
[9] Coplans, *Serial Imagery*, 11.
[10] George Stiny and James Gips, "Shape Grammars and the Generative Specification of Painting and Sculpture," ed. C.V. Frieman, *Information Processing* 71 (1971): 125-135.
[11] Terry Knight, "Transformations of De Stijl Art: The Paintings of Georges Vantongerloo and Fritz Glarner," *Environment and Planning B: Planning and Design* 16 (1989): 51-98.
[12] Sol LeWitt, Incomplete Open Cubes, 1974/1982, 122 Painted wooden structures and pencil on painted wooden base. Wadsworth Atheneum Museum of Art, Hartford, CT.
[13] Sol Lewitt, *Incomplete Open Cubes*, Metropolitan Museum of Art, Accessed December 1, 2024, https://www.metmuseum.org/art/collection/search/691091
[14] Stiny and Gips, "Shape Grammars and the Generative Specification of Painting and Sculpture," 125-135.
[15] Bochner, "The Serial attitude," 28.
[16] Coplans, "Serial Imagery".
[17] Coplans, *Serial Imagery*, 9.
[18] John Coplans, "An Interview with Don Judd," *Artforum* IX 10 (1971): 47-49.
[19] Claudia Jolles, "Interview with Donald Judd, April 5, 1990." *Donald Judd Cor-Ten* (New York: David Zwirner Books, 2016), 9.
[20] Marianne Stockebrand, "Catalogue," *Donald Judd*, ed. Nicholas Serota (New York, NY: Distributed Art Publishers, 2004), 219.
[21] This chart and all its nomenclature is the analysis of the authors and does not reflect terminology or classification recorded by Donald Judd. Some of the terms, such as "double," "open or recessed top," "open or recessed side," and "open or recessed end" are noted by Judd in his sketches.
[22] Don Lippincott, Letter from Lippincott to Donald Judd, Unpaginated.
[23] This chart and all its nomenclature is the analysis of the authors and does not reflect terminology or classification recorded by Donald Judd. Some of the terms, such as "double," "open or recessed top," "open or recessed side," and "open or recessed end" are noted by Judd in his sketches.

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Lewitt, Sol. *Incomplete Open Cubes*, 1974/1982. 122 Painted wooden structures and pencil on painted wooden base. Structures: 2 5/8 x 2 5/8 x 2 5/8 “ each; Base: 29 x 70 x 65”. Diagram for ”Incomplete Open Cubes” from an announcement for Sol Lewitt: Wall Drawings and Structures. Wadsworth Atheneum Museum of Art, Hartford, CT. The Lewitt Estate, Artists Rights Society (ARS) New York. Wadsworth Atheneum Museum of Art, Hartford, CT.

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PREPARING THE DESIGN STUDENT TO BE “EVERYTHING EVERYWHERE ALL AT ONCE”

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INTRODUCTION

The future of graphic design demands a comprehensive understanding of diverse physical, psychological, social, cultural, technological, and economic factors. Modern graphic designers must work collaboratively, manage stakeholder expectations, and utilize various software programs, often requiring long hours at the computer. Essential skills include self-motivation, effective communication, a thorough knowledge of design history and conventions, and proficiency in data visualization and navigating digital interfaces. Employers seek candidates with a blend of social and creative skills, from traditional print products to advanced video and 3D renderings, as a baseline for entry-level positions. This article explores the challenges academic programs face, often housed within art departments, which typically offer only 8-10 courses focused on these competencies. It suggests incorporating group projects, print artifacts, and information literacy within web, video, animation, and 3D classes to bridge the gap between legacy and future design practices, ensuring that graduates are adequately prepared for the evolving job market.[1]

Today’s designers are not just visual creators but systems thinkers, integrating knowledge of physical, psychological, social, cultural, technological, and economic spheres.[2] This "everywhere all at once" mindset is essential for understanding individual design tasks within larger contexts and tackling complex, layered design challenges. In this era of digital saturation, graphic designers are no longer confined to static visuals; designers are tasked with adapting to a dynamic ecosystem of platforms and technologies. Recent job postings underscore this shift, as employers seek candidates skilled in traditional print design and advanced digital competencies like UX design, video editing, and 3D rendering.[3] In addition, designers must now seamlessly integrate into interdisciplinary teams, manage diverse stakeholder expectations, and communicate complex ideas across various media channels.[4] The ability to convey creative concepts with clarity and impact is as important as the technical skill to bring those concepts to life. Traditional curricula, often limited to foundational courses within art departments, struggle to encompass the skills required today.[5] This gap underscores the need for innovative design education emphasizing emerging technologies, collaborative experiences, and practical problem-solving to prepare students for a multifaceted profession.

COMPREHENSIVE UNDERSTANDING OF SYSTEMS

Now, more than ever, understanding interconnected systems is crucial. Designers must consider physical and psychological factors, recognizing how design affects perception and evokes emotions. They must navigate social and cultural contexts, understanding how symbols and imagery vary across

cultures and drive social impact. Technological advancements redefine creative possibilities, while budget constraints demand cost-effective solutions. The complexity of modern design challenges requires systems thinking, addressing interdependent problems through interdisciplinary collaboration and analysis.

Physical and Psychological Factors

Junior graphic designers must consider physical and psychological factors when creating compelling designs. Physical factors include tangible design elements, such as shape, form, visual weight, and other design principles. For example, geometric shapes with distinct lines and sharp edges tend to draw more focus and appear visually heavier than organic shapes.[6] Psychologically, different shapes can evoke certain emotions or associations — circles may convey softness and warmth, while angular shapes may seem more rigid or formal.[7] Students must appreciate and understand color theory and be aware of global and cultural color usage.

Social and Cultural Considerations

Design does not exist in a vacuum — social and cultural contexts deeply influence it. Designers must be aware of cultural associations beyond colors to symbols and imagery to create designs that resonate with the intended audience.[8] For instance, specific colors may have different meanings across cultures. Symbols can also vary in different countries. For example, the eagle symbolizes power in many Western countries, while in Eastern cultures, a dragon might be a better choice. Additionally, designers should consider social issues and how design can be used for positive social change.[9]

Technological and Economic Aspects

Technology has revolutionized the field of graphic design, from software like Adobe Creative Suite to hardware advancements in displays and input devices.[10] Emerging technologies like virtual and augmented reality open new avenues for design innovation. Designers need to consider the cost-effectiveness and feasibility of their solutions within budget constraints.[11] This involves selecting affordable yet powerful tools, optimizing workflows, and managing time efficiently. By balancing creativity with practicality, designers can deliver high-quality work without exceeding budgets.

Complexity in Design Problems

The AIGA Designer 2025 report highlights the increasing complexity of design problems in the modern world.[12] It emphasizes the need for designers to develop systems thinking skills to address "wicked problems" that are ill-defined and interconnected. The report suggests that designers must be able to work across disciplines, analyze patterns in ambiguous situations, and collaborate in diverse teams to tackle complex challenges. They must adopt a forward-thinking mindset to address societal, environmental, and technological issues. This shift requires designers to move beyond creating isolated objects to considering entire systems and their impacts on communities, businesses, and ecosystems.[13]

COLLABORATIVE WORK AND STAKEHOLDER MANAGEMENT

In the contemporary design landscape, collaboration and effective stakeholder management are essential. Design teams thrive on a decentralized, client-oriented structure that fosters rapid innovation, creativity, and adaptability. Composed of diverse experts, these teams benefit from open communication and shared methodologies, enhancing their ability to generate innovative solutions through cross-disciplinary perspectives. The American Institute of Graphic Arts (AIGA) further underscores the importance of interdisciplinary teams for tackling complex design challenges,

advocating for designers skilled in collaborative processes, systems thinking, and stakeholder negotiation. As boundaries between disciplines blur, designers must be prepared to contribute meaningfully to innovative solutions within complex ecosystems.

Importance of Teamwork in Modern Design

In today's complex design landscape, teamwork has become increasingly crucial. Design teams are characterized by their external orientation, focus on client needs, and decentralized structure, which allows for rapid innovation and adaptability.[14] These teams typically have fewer hierarchical layers and rules, encouraging self-management and participatory decision-making. Successful design teams often function as a collection of experts from various professional backgrounds, each bringing unique skills and perspectives to the project. This diversity is a key strength, as the cross-pollination of ideas can lead to more innovative solutions.[15]

Managing Client Expectations

Modern graphic designers must excel in their creative skills and managing client relationships and expectations. Good design firms work closely with clients, functioning more as partners than vendors.[16] Managing client expectations involves regular communication, clear project milestones, and the ability to adapt to changing requirements. Designers must be able to articulate the rationale behind their creative decisions and demonstrate how these choices align with the client's business objectives. This often requires a deep understanding of the client's industry, target audience, and competitive landscape.

An Emphasis on Interdisciplinary Teams

According to the *AIGA Designer 2025* report, design problems are increasingly situated within larger systems characterized by psychological, social, cultural, technological, and economic relationships.[17] AIGA advocates for design education that prepares students to work effectively in diverse teams. This includes developing skills in:

1. Collaborative processes for managing interdisciplinary teams
2. Engaging in group decision-making processes that support building consensus around systems thinking
3. Negotiating with multifarious stakeholders

The report suggests that future designers should be able to address design problems across varying scales and identify relationships between people, things, and activities within complex systems.[18] This approach reflects the evolving nature of design work, where boundaries between disciplines are becoming less distinct, and the ability to synthesize diverse perspectives is increasingly valued.

Technical Proficiency

In today’s graphic design landscape, technical proficiency is paramount, encompassing a mastery of diverse software tools, emerging technologies, and essential digital skills. Designers must be adept with industry standards like Adobe Creative Suite while being agile enough to incorporate newer tools like Figma and specialized 3D modeling or animation software. The growing integration of Artificial Intelligence (AI) and Augmented Reality (AR) further demands that designers adapt to tools that enhance creativity, automate tasks, and enable immersive experiences. Alongside these technical capabilities, the work requires sustained computer use, making ergonomic awareness and time management crucial for productivity and well-being. Proficiency in navigating digital interfaces, with an understanding of UX/UI principles and responsive design, completes the skill set needed to excel in a digitally-focused, fast-evolving design industry.

Mastery of Diverse Software Programs

Modern graphic designers must be proficient in a wide range of software tools to meet the diverse demands of the industry. The Adobe Creative Suite remains the industry standard, with programs like Illustrator, Photoshop, and InDesign essential for vector graphics, image editing, and layout design.[19] However, designers are increasingly expected to be versatile and adapt to new tools as they emerge. Other important software includes Figma for collaborative interface design.[20] Depending on their focus area, designers should also be familiar with web-based tools like Canva and more specialized 3D modeling or animation software. In addition to these traditional tools, the importance of Artificial Intelligence (AI) and Augmented Reality (AR) in graphic design cannot be overstated.[21] AI-powered tools can automate repetitive tasks, enhance creativity, and improve efficiency in the design process.[22] As these technologies continue to evolve, proficiency in AI and AR tools is becoming increasingly crucial for graphic designers to stay competitive and create cutting-edge visual experiences.[23]

Long Hours at the Computer

The nature of graphic design work often requires extended periods of time working on a computer. This demands technical skills, physical endurance, and an understanding of ergonomics to maintain health and productivity.[24] Designers must be comfortable with digital workflows and manage their time effectively to meet deadlines while maintaining work-life balance.

Data Visualization Skills

With the increasing importance of data-driven decision-making, graphic designers are often called upon to create clear and compelling visualizations of complex information.[25] This requires an understanding of data analysis principles, the ability to translate raw data into visually appealing graphics, knowledge of data visualization tools, and skills in creating infographics and interactive data presentations.

Digital Interface Navigation

As digital platforms become more prevalent, designers must be adept at creating and navigating digital interfaces. This includes understanding UX and UI design principles, proficiency in prototyping tools, knowledge of responsive design, and familiarity with web and mobile app design conventions.[26]

Essential Skills for Modern Graphic Designers

To succeed in today's graphic design field, professionals need a blend of self-motivation, effective communication, historical knowledge, and a readiness to tackle complex challenges.[27] Self-motivation is crucial for keeping up with industry trends, continuously improving skills, managing time effectively, and facing new obstacles.[28] Effective communication enables designers to articulate ideas, collaborate, present their work effectively, and develop clear design briefs.[29] A solid understanding of design history and conventions empowers designers to comprehend context, draw inspiration, and innovate while honoring tradition.[30] Together, these skills and perspectives equip designers to navigate and impact the diverse demands of the modern design landscape.

EMPLOYER EXPECTATIONS

Employers today seek graphic designers with a versatile mix of social and creative skills, reflecting the collaborative and client-oriented demands of the profession. Communication skills are highly valued, with 73% of hiring managers prioritizing candidates who excel in this area.[31] As the industry shifts from traditional print to digital, designers must be proficient in both classic tools like Adobe

Creative Suite and newer technologies such as 3D modeling and animation software. Additionally, the digital landscape has broadened expectations, with 92% of business leaders now emphasizing design skills across business functions.[32] For entry-level roles, employers prioritize technical abilities—such as proficiency in Photoshop, Illustrator, HTML/CSS, and digital marketing principles—alongside strong communication, organization, and teamwork capabilities. While technical proficiency is critical, adaptability and potential for growth are equally valued, underscoring the dynamic and evolving nature of the graphic design field.

A Blend of Social and Creative Skills

Modern employers increasingly seek candidates with a balanced combination of social and creative skills. According to a survey by the Interaction Design Foundation, 73% of hiring managers prioritize candidates whose communication skills are their strongest attribute.[33] This emphasis on soft skills reflects the evolving nature of the design profession, where collaboration and client interaction are becoming as vital as technical proficiency.

In addition to communication, graphic designers need strong teamwork skills to collaborate effectively with clients, developers, marketers, and other stakeholders. Other essential skills include:

- Adaptability to evolve with new tools, trends, and challenges.
- Problem-solving to identify creative solutions for complex challenges.
- Emotional intelligence and sensitivity to user needs.
- Successful navigation of client relationships.[34]

Time management is essential for juggling multiple projects and meeting deadlines, while critical thinking allows designers to assess situations and tackle problems from different perspectives. By sharpening these soft skills, graphic designers can increase their value in the workplace and make their work more effective and impactful.

Traditional Print to Advanced Digital Competencies

The graphic design industry has undergone a significant transformation with the advent of digital technologies. While traditional print design skills remain relevant, employers now expect designers to be versatile across various digital platforms. As Poulin notes, designers must be proficient in various software tools, from industry standards like Adobe Creative Suite to emerging technologies like 3D modeling and animation software.[35] Moreover, the rise of digital platforms has created new expectations for designers. According to Canva's *Visual Economy Report*, 92% of business leaders now prioritize design abilities in their workforce, extending beyond traditional design roles.[36] This shift reflects the growing importance of visual communication across all business functions.

Entry-Level Position Requirements

Employers typically look for a combination of technical and soft skills for entry-level positions. According to Zippia, some of the most sought-after skills for graphic designers in marketing include:

1. Proficiency in Adobe Creative Suite, particularly Photoshop and Illustrator
2. Knowledge of website design and HTML/CSS
3. Understanding of digital marketing principles
4. Strong communication and organizational skills
5. Ability to work collaboratively in team environments[37]

Additionally, employers value candidates who demonstrate creativity, attention to detail, and project management skills.[38] These competencies allow entry-level designers to contribute effectively to projects and adapt to the fast-paced nature of the industry. It's worth noting that while technical skills are essential, many employers also value a candidate's potential for growth and adaptability.[39]

CHALLENGES IN ACADEMIC PROGRAMS

Graphic design academic programs encounter various challenges in preparing students with the comprehensive skill set needed in today's industry. Limited course offerings, often restricted to 8–10 classes, can create gaps in students' education, especially regarding emerging digital competencies. Balancing traditional design principles, such as typography and color theory, with contemporary digital practices, like UX design and interactive media, presents an ongoing challenge, further complicated by the rapid advancement of technology. The American Institute of Graphic Arts (AIGA) advocates for curriculum updates to address these gaps, highlighting systems thinking, interdisciplinary collaboration, adaptability, and a holistic approach that considers broader socio-economic contexts. Recommendations include integrating group projects, merging print and digital training, and promoting information literacy throughout courses.[40] However, implementing these changes demands significant resources, faculty development, and curriculum adjustments to ensure that design education remains relevant.

Bridging Legacy and Future Design Practices

Academic programs struggle to balance teaching traditional design principles and incorporating emerging technologies and practices. As Lupton and Phillips note, while foundational skills in typography, composition, and color theory remain crucial, programs must also integrate digital design, user experience, and interactive media into their curricula.[41] This challenge is compounded by the rapid pace of technological change, which can quickly render specific software or technical skills obsolete.

Expanding the Breadth and Number of Design Courses

Many graphic design programs, often housed within art departments, face significant challenges in providing comprehensive education due to limited course offerings. Typically, these programs offer only 8–10 courses focused on design competencies, which may not be sufficient to cover the breadth of skills required in the modern design industry.[42] This constraint can lead to gaps in students' knowledge and skills, particularly in emerging areas of design practice.

The American Institute of Graphic Arts (AIGA) has been a leading advocate for adapting design education curricula to meet the industry's evolving demands. In their *Designer 2025* report, AIGA emphasizes preparing students for a future filled with complex, interdisciplinary challenges.[43] The report highlights the need for design education to focus on developing systems thinking skills to address "wicked problems," encouraging interdisciplinary collaboration, fostering adaptability to navigate ambiguous situations, and promoting a holistic approach to design that considers social, cultural, and economic contexts. To meet these objectives, AIGA suggests incorporating group projects, integrating print artifacts within digital courses, and emphasizing information literacy across all design classes.[44] This approach bridges legacy and future design practices, ensuring graduates are prepared for the evolving job market. However, implementing these changes can be challenging for academic institutions due to limited resources, faculty expertise, and institutional inertia. As Heller and Vienne note, design education must evolve to remain relevant, requiring ongoing investment in faculty development, curriculum review, and infrastructure upgrades.[45]

In tandem with AIGA's recommendations, technical proficiency has become a cornerstone of success in the rapidly evolving field of graphic design. As the industry embraces digital technologies, designers must navigate a complex landscape of software tools, artificial intelligence (AI), and augmented reality (AR) applications. The National Association of Schools of Art and Design (NASAD) underscores the importance of maintaining appropriate technological resources and instruction in graphic design programs, ensuring students are adequately prepared for the professional

world.[46] Mastery of essential software, fluency in emerging technologies, and adaptability are crucial for thriving in today's dynamic profession. From industry-standard programs to cutting-edge AI and AR tools, graphic designers need a diverse and expanding technological toolkit to meet contemporary challenges in visual communication, aligning with NASAD's guidelines for comprehensive design education.

PROPOSED SOLUTIONS FOR DESIGN EDUCATION

To better prepare students for the evolving demands of the design industry, several key solutions have been proposed to address the challenges in design education. Incorporating group projects is widely recommended to help students develop collaboration, time management, and problem-solving skills essential for professional success.[47] For group work to be effective, projects must be carefully structured to encourage meaningful teamwork, creativity, and deep collaboration.[48]

Integrating print artifacts into digital courses bridges traditional and modern design practices. This approach, as suggested by Davis in the *AIGA Designer 2025* report, allows students to understand the relationship between physical and digital design, enhancing their versatility.[49] For example, incorporating print projects within web design courses helps students apply design principles across different media.

Emphasizing information literacy across all design classes prepares students for a complex, data-driven landscape. Information literacy skills, as noted by the Association of College and Research Libraries (ACRL), enable students to navigate, evaluate, and effectively apply information throughout the design process.[50]

The American Institute of Graphic Arts (AIGA) recommends a design education focused on systems thinking, interdisciplinary collaboration, adaptability, and a holistic approach that considers broader social, cultural, and economic contexts.[51] These strategies equip students with the skills and perspectives to tackle real-world design challenges.

The Expanding Role of Graphic Designers

Contemporary graphic designers must have a comprehensive understanding of various systems, including physical, psychological, social, cultural, technological, and economic factors. This holistic perspective is essential for contextualizing individual design tasks within broader frameworks and tackling complex challenges. In today's digital age, the roles of designers have significantly expanded:

1. **Multi-dimensional expertise**: Designers operate across multiple domains, processing vast amounts of data to inform decisions regarding consumers and societal issues.
2. **Technological fluency**: Designers must navigate a non-linear design space, requiring constant adaptation to emerging software and technology.
3. **Expanded skill set**: The role now includes digital platforms and advanced competencies such as UX design, video editing, and 3D rendering.[52]

This shift reflects the growing industry demand for versatile designers adept at adjusting to rapidly evolving technological landscapes.

The Role of Collaboration and Communication

Collaboration is now a cornerstone of graphic design practice. Designers must work effectively in interdisciplinary teams, manage stakeholder expectations, and communicate complex ideas across various channels.[53] Clear articulation and presentation of creative concepts have become as important as the technical skills needed to execute them.

Educational Challenges and NASAD Recommendations

Academic programs struggle to equip students with the broad range of skills demanded by the industry. Limited course offerings, often restricted to 8–10 classes within art departments, contribute to a gap between education and professional requirements.[54] This gap highlights the need for innovative approaches integrating new technologies, collaborative projects, and real-world problem-solving experiences.

The National Association of Schools of Art and Design (NASAD) provides several recommendations for university graphic design curricula to bridge this gap:

1. Expand course offerings beyond the typical 8–10 classes for more comprehensive coverage.[55]
2. Balance foundational design principles with modern digital competencies.
3. Incorporate interdisciplinary collaboration and group projects.[56]
4. Integrate print and digital design practices.[57]
5. Emphasize information literacy across all design courses.[58]
6. Foster systems thinking and holistic approaches.[59]
7. Develop a curriculum promoting adaptability to handle ambiguous situations.[60]
8. Include hands-on, experiential learning opportunities.[61]
9. Expand focus to soft skills, such as communication and teamwork.[62]
10. Regularly review and update curriculum to align with industry needs.[63]
11. Invest in faculty development and infrastructure upgrades to keep up with industry standards.[64]
12. Cultivate industry partnerships to ensure curriculum relevance.[65]

By implementing these recommendations, design education programs can better prepare students for a multifaceted, technology-driven design industry, closing the gap between academic training and the evolving needs of professional practice.

CONCLUSION

The concept of "everything everywhere all at once" aptly describes graphic design's current state and future trajectory. As the boundaries between disciplines continue to blur, designers must embrace a holistic, adaptable approach to their craft. Educational institutions and industry professionals must rise to the challenge of preparing the next generation of designers for this complex, interconnected landscape.

The Importance of Adapting to the Evolving Job Market

The graphic design industry is rapidly transforming, driven by technological advancements, changing consumer preferences, and evolving business needs. As such, the importance of adapting to this dynamic job market cannot be overstated. Graphic designers must continually update their skills and knowledge to remain competitive and relevant. The rise of AI and other digital technologies has led to concerns about job displacement, but experts suggest that these tools can enhance creativity rather than replace human designers.[66] This perspective underscores the need for designers to embrace new technologies and integrate them into their workflow, positioning themselves as leaders in the evolving design landscape.

Preparing Graduates for the Future of Graphic Design

To prepare graduates for the future of graphic design, educational institutions must balance teaching traditional design principles and incorporating innovative technologies. This approach ensures that students have a strong foundation while being equipped with the latest tools and techniques.[67] The future of graphic design education should focus on developing a comprehensive skill set beyond mere software proficiency. As highlighted by AND Academy, essential skills for graphic designers include

knowledge of design principles, color theory, branding, communication, problem-solving abilities, and creativity.[68] These skills and technical proficiency will enable graduates to adapt to the evolving job market and thrive in their careers.

Moreover, the industry is shifting toward remote work, freelance opportunities, and specialized roles.[69] Educational programs should prepare students for these new career paths by incorporating project-based learning, internships, and exposure to real-world design challenges. In conclusion, the future of graphic design is both exciting and challenging. By fostering adaptability, embracing new technologies, and developing a well-rounded skill set, graphic designers can position themselves for success in this dynamic field. As the industry evolves, those who remain flexible, innovative, and committed to lifelong learning will be best equipped to navigate the changing landscape and make meaningful contributions to visual communication.[70]

NOTES

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RECONSTRUCTING THE "INTERFACE" OF DIGITAL PUBLIC ART: FROM FORM, ETHICS TO PUBLIC SPIRIT

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INTRODUCTION

Public art in the contemporary era also faces the challenges and tests of digitalization. Digital technology has influenced the morphological characteristics, technical creation, and the construction of public spirit in public art, with form, technology, and public spirit being crucial aggregations and manifestations of the digital public art interface. Contemporary digital public art attempts to utilize data, materials, and algorithms while still intertwining with traditional materials, techniques, and forms. Therefore, the reconstruction of the "interface" of digital public art has brought about a comprehensive upgrade and functional transformation in form, ethics, and digital public spaces. The public spirit is currently facing the challenges of digital impact and big data capitalism, along with the potential crisis of all consumer cultures transitioning from capital production to desire production. This further emphasizes the relationship between "public sphere," "common sense," and "spiritual community" with digital public art, and presupposes the dissolution of classical liberal public spirit and the return of Marx's political philosophy to the public spirit of public art in the current digital age.

The transformation of the interface in digital public art represents a cutting-edge and highly challenging self-reinvention. The concept of "interface" (inter-face) was introduced in Jürgen Habermas's 2022 work, The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society and Deliberative Politics, where it presaged a new set of possibilities for dialogue ethics, deliberative politics, and the transformation of public space in the era of digital media. Particularly relevant today is its applicability to the virtual public spaces woven by digital network media. Since the 1960s, the transformation of the "public sphere" can no longer be achieved through the communicative actions of class-based and democratic dialogues as in the past. For contemporary researchers of digital public art, this represents a form of self-metamorphosis—no longer confined to the discourse of intersubjectivity and the castration of subjective desires that once revolved around The Structural Transformation of the Public Sphere. Instead, it calls for a re-examination of new forms of publicness and digital public art on the interface in the context of the new digital media era.

THE THRESHOLD OF FORM IN DIGITAL PUBLIC ART

The emergence of digital technology has ushered in a new wave of transformation in the materials and mediums of artistic creation. Moving beyond traditional materials such as stainless steel, wood, metal, fiberglass, and organic synthetics, artists now harness computer technology, network technology,

virtual reality, artificial intelligence, and data algorithms. The creation and exhibition of digital public art, relying on these emerging digital technologies, have produced works that are fundamentally different from those of the past. Techniques such as computer programming, multimedia production, and network transmission provide foundational support for the creation and presentation of digital public art, enabling artists to express themselves more freely. This shift has transformed public art from its traditional forms into new forms within a digital context. As form gains more interpretive dimensions, it not only reflects the transition from traditional to new media but also raises questions about the boundaries between art and technology. It embodies the interplay between material and spiritual orders, opens up artistic experiences from the visual to the multisensory, and reveals the evolution from conventional to digital forms, while also signaling the reconstruction of digital and public realms.

Media Transformation and Boundary Exploration

In the media transformation of digital public art, digital technology has had a profound impact on its development. The methods and means of creating digital public art have undergone significant changes. It no longer relies on traditional mediums such as painting, sculpture, or installation but instead employs digital technologies like digital imaging, digital music, virtual reality, interactive media, and holographic projection. The continuous development and innovation of these technologies have infused digital public art with new vitality. On the other hand, this transformation reflects the artistic forms that emerge from the external and internal dimensions behind the technology.

The external dimension includes material mediums, formal languages, and thematic content, while the internal dimension emphasizes aesthetic concepts, cultural connotations, and spiritual directions. The distinction between the internal and external dimensions highlights a self-renewal of form in digital public art, which has comprehensively deepened the exploration and development of the digital realm. This represents a dual consideration for the creative transformation of public art itself.At the same time, digital public art must remain attentive to the unique singularity of the site it inhabits. Even as digital technologies translate space from traditional physical settings into virtual realms, the distinctive character of the place where the work is located deserves to be honoured and foregrounded.

As Walter Benjamin writes, “Even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be.”[1]

A marketing campaign designed by the French National Railway Company (SNCF) in collaboration with Paris-based marketing firm TBWA serves as an example. Aimed at encouraging people to travel, they created a digital public art piece titled Any Door—Europe is Next Door in bustling urban areas. Each door featured an LED screen that, when opened by a passerby, displayed life-sized scenes and characters from various European locations. More remarkably, the public could interact with the figures on the screen—dancing together, having their portraits drawn, and so on—as if they were truly in that city. SNCF hoped this creative initiative would inspire people to travel, generate business opportunities for the railway company, and showcase the convenience of rail travel. The campaign created a real-time, cross-spatial, multicultural mirror of Europe. When passersby opened the doors, they might see a clown in Milan's square, a young dancer in Barcelona, or a street artist in Brussels. The use of technology created an imaginative mode of communication. This work directly dissolved the barriers between art and technology, achieving a synergy between traditional inheritance and digital media in the form of digital public art.

Figure 1: Any Door
Artwork: Door Installation, LED Screen
Image Source: SNCF Official Website

From Visual to Multisensory Artistic Experience

Digital public art offers more than just a visual experience; it can achieve a "multisensory experience" within the same time and space, integrating vision, hearing, touch, taste, and individual consciousness to create an entirely new artistic encounter. From another perspective, the artistic experience of digital public art emphasizes a shared sensibility and empathetic identification. Grant Kester suggests that the emergence of "empathetic identification" stems, in part, from a transformation of Jürgen Habermas's ideas. In Habermas's theory, an "encounter" occurs within what he defines as the "public sphere," where participants must adhere to certain constraints and norms. Paradoxically, these norms isolate the originally shared public space. However, within this isolated space, dialogue remains free from oppression and inequality. As Habermas states, "Every subject with the capacity for speech and action is allowed to take part in discourse. Anyone may question any assertion, introduce any assertion, and express their attitudes, desires, and needs."[2]The possibility of dialogue through "encounters" and the empowerment it brings have inspired later audiences to engage in communicative actions. This participation and dialogue have even influenced subsequent projects and decision-making processes.
Therefore, Kester argues that "within this framework, dialogue leads to sympathy and identification with the other. Critics should not focus solely on the form of the artwork but should report with empathy and evaluate the artwork's ability to engage with society, listen to its context, and respond to its audience. It is about establishing 'empathetic identification' between the artist and their collaborators."[3] The subjects involved here are not limited to the artists themselves but also include the audience, critics, and media. Thus, Kester proposes that establishing "empathetic identification" is not merely about evoking emotions and fostering empathy and collaboration but also about reaching a consensus on an issue, a social phenomenon, or a reflection on human nature.[4]

Reconstruction of the Digital and Public Realm

With the advent of the digital age, the question of how to reconstruct the public sphere has been inspired by Jürgen Habermas's reflections on traditional print media, such as newspapers and publications. Particularly in the public space formed by digital media and its interconnected virtual networks, we now face challenges brought by new digital media regarding the authenticity and falsity of information, the nature of dialogue and interaction, and the formation of opinions and consensus.

“By establishing new connections as ‘irresponsible’ mediators within the global network and initiating and intensifying dialogues with unpredictable content through the increased frequency and speed of accidental encounters, these technologies have profoundly altered the characteristics of public communication. ”[5] In the face of these features of the public sphere in the digital age, the modes of interaction and dialogue among the public are no longer confined to the traditional roles of active output and passive reception. The physical transformation of public art will also evolve alongside the transformation of the digital public sphere, reshaping the relationship between creation and dissemination.

ETHICAL CONSTRAINTS IN THE DIGITAL PUBLIC SPHERE

Habermas's emphasis on the public sphere primarily hinges on two aspects: first, the promotion of communicative action, which underscores the importance of subjectivity and publicness in modern society; and second, the critical role of discourse ethics in mass media, which highlights the necessity of establishing liberal democratic institutions in Western society.

In the context of the arrival of the digital public sphere today, it is essential to recognize that the issue is not only the social norms generated by discourse ethics but also the fact that the reconstruction of digital media and the public sphere interface in the digital age has rendered discourse ethics ineffective within the original social structures and traditional public spaces. This critique stems primarily from Omid A. Shabani's analysis of Habermas: "In the process of the lifeworld, mainstream media coordinate and influence actions within the political and administrative spheres, causing these systems to lose normative regulation based on agreements centered on more universal interests. While this process explains the impoverishment of culture and the transformation of symbolic interactions, it also makes consensus-driven dialogue and the legitimacy of political power impossible. Simply put, the distinction between the lifeworld and systems leads to two problems. First, because the logic and structure of the lifeworld and systems place power under the control of mainstream media, the theory cannot explain the legitimate use of power. Second, mainstream media has a homogenizing effect on the consensus-driven dialogue context of the lifeworld, an effect that arises from the transcendent characteristics of universalizable interests."[6]

From Shabani's perspective, he emphasizes the guiding role of mainstream media in the contemporary lifeworld and public space. To establish discourse ethics and generate consensus among individuals, the normative formation of social public consensus under the influence of mainstream media plays a crucial role. This corresponds to the universal reality of traditional media being impacted by digital media in the current era. Beyond mainstream media, the resulting phenomenon is the prosperous development of self-media and streaming media, which have a decisive influence on the establishment of universal norms and consensus within the broader social public space. Compared to communicative action, discourse ethics appears more relevant today, as it depends on the audience acting as communicators, playing a pivotal role in this process.

It is essential to clarify whether discourse ethics remains effective in the new era of digital media. The struggle for rights and democratic progress that Habermas analyzed within the bourgeois society of the past is no longer applicable. In the interface formed by digital media, all democratic processes and political negotiations of rights have been transformed into mechanisms of data filtering. Consequently, discourse ethics must shift toward a form of digital ethics—a framework capable of addressing issues related to the manipulation of capital,traffic and real-world relations within the big data filtering mechanisms. Digital ethics must resolve the problems that arise in this context. Thus, under the current barriers to establishing digital ethics, struggles for political power persist, with individuals using the guise of "public rights" to mask their true intentions. Therefore, the ethics of the digital age carry an even greater responsibility than those of traditional media. To awaken ethical

consciousness within the "public interface" constructed by digital technology, a reconstruction of the public spirit is necessary.

THE RECONSTRUCTION OF PUBLIC SPIRIT ON THE DIGITAL INTERFACE

In the era of digital public art, how can the process of forming a public interface lead to a shared interest between individuals and the community? How can we find a way to awaken the public spirit in the context of data capitalism, where individuals are increasingly alienated from others and the collective? Digital public art offers a pathway to explore and address these questions, providing a rational approach to these challenges.

The Public Spirit of Subjective Reconstruction

The reconstruction of the public spirit through subjective consciousness serves two purposes. On one hand, it curbs the classical liberalist tendency to excessively amplify individual rights, ensuring that individuals maintain a clear awareness amidst nihilistic values and the realm of public spirit. This, in turn, plays a crucial role in replenishing political strategies, moral ethics, and the return to values. On the other hand, it mitigates the classical political philosophical tendency to excessively amplify state will and power, thereby advancing the establishment of contemporary public spirit and the realization of a more practical community. To achieve this, the reconstruction of the public spirit through subjective consciousness must address two key issues: first, how to reconstruct the "common sense," and second, how to construct the unity of the lifeworld.

The digital public art piece Portal made its debut on May 8, 2024, in the plaza beneath New York's Flatiron Building. Created by Lithuanian artist Beneditas Gylys, the work features a massive circular structure with an LED screen at its center. What makes it unique is its ability to connect in real-time to Dublin, Ireland, where an identical installation is placed on O'Connell Street, the city's main thoroughfare. Both installations are set against the backdrop of each city's most iconic buildings and are located in bustling public squares, fulfilling the artist's vision of summoning the public, collective participation, and mutual interaction. The public spirit in modern life is not merely about metaphysical endowment of subjective rights but also about transcending class, social circles, utilitarianism, and capital. It offers a modern digital lifestyle that allows people to experience the diversity of life, embrace cultural pluralism, achieve value consensus, and embody the publicity of art.

Figure 2 & Figure 3. Portal Installation at Flatiron Building Plaza, New York City
Image Source: Photographed by the Author

The "Big Other" of Public Spirit on the Digital Interface

The establishment of public spirit is no longer confined to the traditional classical politics or classical liberalism periods. It has given rise to a new relationship mediated by the "interface". According to Habermas's theory, the traditional public spirit relied on "discourse" or communicative action. However, in the relationships constructed by the interface, the subject is not necessarily a tangible entity—it can be virtual. As Slavoj Žižek states, "The 'interface' precisely means that my relationship with the other is never 'face-to-face'; it is always mediated by a digital mechanism in between. It represents Lacan's 'Big Other,' an anonymous symbolic order structured like a labyrinth. I 'browse,' I wander in this infinite space where information flows freely without a fixed destination, and the entire information space—this vast circuit of 'heteroglossia'—always exceeds my comprehension."[7] Here, the "Big Other" can be understood as a big data platform, a technological means that mediates human interactions. On the digital interface, the physical body is no longer the tangible entity that traditionally engages with public art. Instead, it transforms into online virtual identities, symbolic representations, and accounts. This calls for a subjective public spirit that is not merely a political strategy for existence but also a means for individuals to create the public values and political strategic needs required by society across various domains. This, in turn, constructs a life mode and way of existence better suited to the digital age.

CONCLUSION

Indeed, the advent of the digital age presents an opportunity for public art to transition from traditional forms to digital forms. However, it is crucial to recognize the challenges faced by digital public art in the public sphere, which extend beyond issues of rights ownership to include capital, algorithms, social circles), interests, and other dimensions of social value. Therefore, digital public art carries a greater mission: to awaken ethical consciousness within the "public interface" constructed by digital technology and to reconstruct the public spirit. In the face of historical shifts in public spirit, its evolving connotations continuously adapt to the spiritual and value demands of the current digital age. By establishing a subjective spirit, public spirit reinvigorates a new digital model suited to modern life. Using digital public art as a vehicle, even in the face of the intrusion of the "Big Other," it can transcend time and space, establish ethics, and seek new models of value within the virtual interface.

NOTES

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BETWEEN OTHERING AND OWNING: PIERRE LOTI'S RAMUNTCHO AS FULCRUM FOR MYTH TRANSPOSITION IN BASQUE LITERARY ADAPTATION

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INTRODUCTION- A HERMENEUTIC THOUGHT EXPERIMENT THROUGH A SPOT OF LITERARY ARCHAEOLOGY

Elephants, manatees and hyraxes (known as dassies in South Africa) do not look alike, are wildly different in size and apparent morphology, and occupy very different ecological niches. However, they are all related through a common ancestor in the clade "Tethytheria" that died out more than 50 million years ago. On the other side of scholarship in the field of film studies, it is equally fascinating to understand how seemingly unrelated adaptations are historically interconnected.

Things Fall Apart is a film adaptation in development, following two earlier ones in 1971 and 1987, of the iconic 1968 novel of the same title written by internationally lauded Nigerian author Chinua Achebe.[1] Starring and executive produced by Idris Elba, the film is conceived as a relatively faithful transposition of the "story of Okonkwo (Elba), one of literature's most iconic characters—a fearless African warrior and leader who is resolute about preserving his people and culture".[2] Some twenty years ago, the film *Obaba* was written and directed by Montxo Armendáriz and adapted from the lauded Euskera-language work *Obabakoak* (1988) by Bernardo Atxaga, who also received a number of national and international nominations and awards.[3] The film is "set in the mythical region of Obaba in the northern Spanish countryside" and serves to "knit a magical-realist style, with the director's concern for the relationship between an individual and his social context", and centres on "the protagonist's attempt to capture the reality of Obaba", thereby discovering an own identity.[4]

The similarity between the films seems slim beyond their being adaptations of highly prized works by celebrated national literary icons whose goals were to foreground the cultural specificity of ordinarily marginalised societies- Nigeria and the Basque Country respectively. However, a deeper dive into their adaptational lineages through an analysis based in intertextuality and intermediality reveals a shared late 19th century antecedent text: Pierre Loti's *Ramuntcho*, which itself has separately been adapted multiple times.[5] This text foreshadowed two different lines of storytelling- one binary and the other dualist- that resulted in an unusual case of convergent literary evolution in Achebe's and Atxaga's works that are both similar and different in surprising ways.

At first glance, *Things Fall Apart* and *Obabakoak* may appear to be somewhat similar in how both focus on animal-based mythologies in Igbo and Basque cultures respectively. On the one hand, Achebe recounts folktales like the Story of the Vulture and the Sky, Mother Kite and Daughter Kite, Leaves, and the Snake-Lizard who kills his mother after a mis-understanding about the volume

vegetables occupy after cooking.[6] Atxaga, in comparison, deals primarily with a myth adopted from Basque oral storytelling about lizards that purportedly crawl into people's ears and eat their brains, which recalls associations in Basque folklore between lizards and a mythical figure of Sugaar (or Sugar, Sugoi, Subarray, Maju), the male half of a dragon or serpent god from pre-Christian culture that is linked to harsh inclement weather, fire and storms. From an anthropological perspective, however, the myths are unrelated since they serve very different purposes in Igbo and Basque cosmologies respectively, and are therefore not a suitable foundation for comparative analysis.

The different lineages of storytelling, however, indeed do bring the stories together, if approached through a hermeneutic thought experiment that considers comparative analysis of literary adaptation to be about something other than similarities in subject matter- their 'flesh' so to speak. Here we turn to a narratological analysis based in a focus on how stories carry over from prior versions to later ones through forms of storytelling- the 'bones' of mode of narration and story structure. One key tool that reveals these bones is the concept of 'focalisation' that refers to the perspective through which a narrative is presented, as introduced by French literary theorist Gérard Genette.[7] This provides a linguistic-semiotic explanation of where writers place readers in relation to the story when they recount- in other words 'through whose eyes is the story recounted, and where is the storyteller in relation to the reader?'

The resulting literary-archaeological brush for analysis is sufficiently strong to dislodge irrelevant detritus that scholars often take to characterise texts in comparison to others- for example assertions of story comparability on the basis of similarity of theme, plot or subject matter. Further, it is gentle enough to reveal the narrative bones that enable comparison between texts that 'do' similar things even though they may look different, thereby revealing non-obvious foundations for stories lodged both in what influenced their authors and in the morphological characteristics of the texts. This allows for a more effective understanding of ancestral lineages for stories of local cosmologies and myths that differ anthropologically from one another as with *Things Fall Apart* and *Obaba*.

The analysis of how mythological representation was primed by prior texts to these reveals something interesting: that although the myths themselves are unconnected, the celebration of local myth in both Achebe's and Atxaga's stories can be tracked back through a sequence of prior stories to a common ancestor that served as a fulcrum for two distinct lineages of storytelling best describable as binary and non-binary. These lineages then emerged in a prioritising of myth in a process akin to 'convergent evolution'.

FROM *HEART OF DARKNESS* TO *THINGS FALL APART*: A TRAJECTORY OF BINARIES

Polish-British author Joseph Conrad's *Heart of Darkness* has had a chequered reception.[8] Many scholars have lauded its role in exploring the failure of colonialism, the feral nature of people, and darkness within civilization, which thereby challenges nineteenth century European tropes of the moral, social and economic benefits of imperialism. Achebe, however, described it in his Second Chancellor's Lecture at the University of Massachusetts Amherst in February 1975 as "an offensive and totally deplorable book" that "incorrectly depicted Africa as the antithesis of Europe and civilization", through "no more than a steady, ponderous, fake-ritualistic repetition of two antithetical sentences, one about silence and the other about frenzy".[9] As well as being a valuable position in a twenty first century post-colonialist discourse that has profoundly discredited imperialist paradigms, it also serves as a point of departure for exploring the dynastic descendants of the discourses of colonialism that can perhaps best be described as a lineage of binary polarity.

Conrad clearly took his cue from the dominant imperialist paradigm in nineteenth century European literature that persistently phrased the relationship between Europeans and Africans in terms of a

'them and us' logic. This is especially apparent in Henry Morton Stanley's writing on Africa that shows distinct similarities to Conrad's story about Marlow's journey up the Congo River in search of Mr. Kurtz, an enigmatic and morally ambiguous man consumed by power and greed. As Griffiths points out, Marlow's up-river journey is mirrored in different ways in both *Through the Dark Continent* that tracks Stanley's progression of Africa and charting the Congo River in 1874-77, and *In Darkest Africa* that is about Stanley's trip along the Congo River to relieve Emin Pasha in 1886-89, while *How I Found Livingstone* presents a 'narrative of detection' in the pursuit of David Livingstone in 1871-2 that is akin to Marlow's search for Kurtz.[10] This narrative of the European "civilising" mission based in a binary trope bled into three main similarly binary responses found in next-generation versions of *Heart of Darkness*: counterpoint, replication, and revision.

Counterpoint

Achebe's response to the bilious binary imperial stance was to narrate *Things Fall Apart* from the perspective of African people fighting colonial invasion and cultural erasure, from a focalizing position occupied by Okwonko who locates the story from and towards Africa by means of an 'insider' view of indigenous experience. This directly countered Conrad's storytelling via a narrator who tells the story to a European audience from a boat on the Thames, and who recounts at a further remove the character Marlow's secondary account of Kurtz' story. This reflects an attempt to "draw a *cordon sanitaire* between [Conrad] and the moral and psychological malaise of his narrator", that renders the nameless European narrator who recounts a story he has not himself seen play out as an agent of the almost total effacement of the value and cosmologies of the people of the Congo.[11] Achebe, in contradistinction, actively presented an opposing African perspective through providing an insider view of the world of the Igbo people and their cosmologies, via a narrator recounting events with a sense of immediacy and presence. This position is enormously powerful in expressing the voice of colonized people in response to an historical obliteration of representation, and relies heavily and necessarily on the intentional re-instatement of the binary of Africa and Europe as a way to reinforce the locality of experiences that were historically obliterated by colonialism.

Replication

Although *Heart of Darkness* was also made for television by Nicholas Roeg, perhaps its best-known offspring is Francis Ford Coppola's quasi-adaptation film *Apocalypse Now*, which was adjusted from the original through a setting in the 1960's Vietnam War instead of colonial Congo, and was a monstrously expensive vanity project that largely relies on the same 'us'/'them' tropes as the original.[12] In *Heart of Darkness*, Kurtz starts out intent on bringing Western 'civilisation' to Africa and suppressing local customs, and ends adopting what Conrad describes as 'primitive, lustful savagery'. This is mirrored in *Apocalypse Now* in a Kurtz who turns from ideologically driven soldier to a rogue militant with no compunction about killing.[13] In *Heart of Darkness,* "Conrad's natives have no culture; they represent man in a state of nature with all his archaic, primal passions unrestrained by civilization", while the contextual shift in *Apocalypse Now* remains minimal in how "Coppola's natives do not corroborate the thesis that Col. Kurtz has surrendered to primeval lusts, for they are not savages. Theirs is a coherent culture in which violence and death are meaningful parts of man's relationship to the cosmos.".[14] This shift problematically presents Asian people in a similarly one-dimensional binary in terms of an "inscrutable wisdom of an alien culture" in contraposition to "the emptiness of the colonialist's desire".[15]

A more recent adaptation is a graphic novel published in 2010 by David Zane Mairowitz' in collaboration with Swedish/Kenyan artist Catherine Anyango.[16] Cooke describes Anyango's artwork as "cloudy not only with river mist but with foreboding. Every face is sunken of eye and hollow of

cheek". It is filled with graphic panels that are "truly terrifying: the moment when Marlow sees the human heads on sticks outside Kurtz's Inner Station; the scenes in which Kurtz breathes his horrible last; and, most spectacularly, those which depict not human beings but the jungle itself."[17]

Although the frames are graphically tragic in dire commentary on colonialism, like Conrad's book and Coppola's film they preclude representations of local culture and lore. Instead, the text reflects "a distillation of dread" that, according to Faber, does not even compare favourably to *Apocalypse Now*, which "captures the thrill of colonialism as well as the horror, the tragic allure of dying empires and the testosterone-fuelled lunacy of next year's wars".[18] Mairowitz' and Anyango's work, however, "to its credit and to its detriment – confines itself to dark shadows and ghosts.", which merely in effect replicates the binary in Conrad's work.

Revision

A postcolonial version of *Heart of Darkness* that promised to shake things up is Peter Kuper's graphic novel[19] that both follows Conrad's original story and "acknowledges the book's complicated history".[20] Lehoczky argues that "Kuper takes every possible opportunity to show Conrad's story from the Africans' point of view. We see the African steamboat crew's reaction upon being given their weekly 'salary' of three pieces of brass wire, and villagers' terror of the colonials' firearms". However powerful this accommodation of subjectivised horror might be in a graphic form, it does not dilute or challenge Conrad's us/them binary in that, although "Conrad's original text leaves far too much to be guessed about the African characters" and "Kuper pours as much humanity into them as he can", this does not tell the story from their perspective, nor does it reflect the kind of agency of African people foregrounded in Achebe's expression of their fight against colonial oppression.[21]

BEHIND *HEART OF DARKNESS*: PIERRE LOTI'S *RAMUNTCHO*

Heart of Darkness is "layered, with meaning conveyed in the acts of transmission by which stories are communicated and by the traces of other texts apparent within it", in a "stylistic three-dimensionality" and "multi-languaged consciousness" that is called on to navigate "powerful opposing impulses – closing off/opening up; imperialism/anti-imperialism".[22] As Bogue notes, "colonialism is not Conrad's primary subject; it is merely the context in which Kurtz and Marlow come to understand the truth of human nature. Conrad does not approve of colonialism but sees it as a necessary stage in a universal pattern of history."[23] From this beginning, Conrad effected a seemingly contradictory result in *Heart of Darkness*: both an 'opening up' of the discursive norms through calling attention to the horrors of rapacious invasion in a fashion seldom found in late 19th century literature, and a parallel accommodation of imperialism as a putatively necessary evil that he mobilized for a complex existential commentary.

Conrad's failure (choice?) to substantively challenge binary imperialist thinking suggests a conscious decision to avoid drawing from other frameworks that had currency in the era, particularly ones evidenced in the writing of authors from whose work he drew. One such is French author Pierre Loti, whom Conrad held in high esteem, and from whose work *Ramuntcho* he appears to have borrowed for *Heart of Darkness* in terms of both theme and plotline.[24] Like Conrad, Loti drew from his wide experience as a naval officer. However, unlike Conrad, Loti does not appear to have considered there to be a distinctive imperialist binary cultural difference between Europe and the rest of the world, as is evidenced by an approving stance on indigenous cultures outside of Europe in some of his other works.

His novel *Ramuntcho* subtly showcases this non-binary stance in how it centres on questions of identity, heritage, and freedom, in a tension between personal ambition and the pull of ancestral roots in Basque world of the Pyrenees. The titular character is the illegitimate child of a Basque woman and

French man, who grew up fatherless in a village where he learned a sense of Basque pride and tradition, yet feels out of place, torn between his Basque roots and community, and a desire to escape the limitations of village life and explore the world beyond the Pyrenees. Ramuntcho is a smuggler working across the French-Spanish border, the dangers and physical demands of which he enjoys, but that also complicates his standing in the community. He lives on both sides of borders in his daily life, and aspires to emigrate to America with his fiancé, Gracieuse, a wish that remains unfulfilled when her mother opposes the union and she ultimately retreats to life as a nun.

Torn between a yearning for freedom and loyalty to the Basque culture, Ramuntcho remains bound to the Basque lands indefinitely, which renders the novel a story about a cultural counterpoint to the dominant imperial powers of Spain and France that had at the time of Loti's writing for centuries sought to de-legitimise the Basque people their culture, and the Euskera language- a situation that only changed in the late 20th century and arguably perhaps still pertains. More than this, however, it is not a subtle 'us-and-them' narrative that might otherwise set Basque people in opposition to French or Spanish power and culture, but instead deals with a social complexity borne of reality that lives alongside an imperialist power dynamic, which Conrad did not draw on in *Heart of Darkness*. Notably from a perspective of focalization, *Ramuntcho* is not told at the double remove that characterizes Conrad's work- nor indeed at a singe remove- but instead is recounted from the perspective of the main character within the Basque country. This thereby reflects Basque culture with a dual yet not binary perspective: on behalf of a character who is both local and foreign, and feels subjectively alienated yet also harbours a deep sense of belonging. The result is a story that positions the culture of the Basque Country as a complex idea from which a range of adaptational lineages could emerge, and notably two lines of offspring did.

CONCLUSION: *RAMUNTCHO* AS FULCRUM FOR MYTH TRANSPOSITION

On the one hand, Conrad relied on Loti's story as inspiration for theme and plot, but did not adopt the dual perspective, instead retaining a binary representation of Europe vs the 'other'. This in turn birthed the range of replication and revision-based film and graphic novel adaptations, as well as the counterpoint response by Achebe that was then turned into filmic adaptations. In the other direction, Loti's story fed into a number of adaptations that remained largely faithful to the original in terms of plot, theme and representational ethos, made in 1919, 1938 and 1959, while a sequel, *The Marriage of Ramuntcho* was produced in 1947, all of which were similarly 'dual' rather than 'binary' in flavour. Perhaps more relevant to the question of Basque myth that was as absent in the adaptations as it was in Loti's original, *Ramuntcho* directly inspired a short story, 'Esteban Werfell' as a story of an insider-outsider within the Basque Country that was initially published in the short-lived magazine Pott. This story found its way into Atxaga's compendium novel *Obabakoak* and then was foregrounded in the 2005 film *Obaba*, thereby directly importing Loti's dualism into the adaptational offspring.

All these stories inherited the theme of the importance of Basque identity and stories about belonging in the historical context of linguistic and cultural marginalization and the tension between tradition and change[25]. With this theme came the opportunity to represent culturally important myths that emerged as the story of the lizard in *Obaba.* In contradistinction to *Things Fall Apart*, where Achebe had to fight against the precursor text to import local mythology, *Obaba* was based on the importance of locality and indigenous consciousness, from which it is an easy task to import stories of myth. In both directions from *Ramuntcho* there emerged in parallel two representations of mythology, in subsequent adaptations and daughter texts, and in two distinctive paradigms: binary and dual. The binary direction resulted in a powerful story of Igbo myth and politics in the works of Achebe and now Elba, while the dual direction resulted in a powerful narrative of Basque identity and myth in

Atzaga's *Obabakoak* and Armendariz' *Obaba*, which renders Loti's *Ramuntcho* a fulcrum for myth representation.

NOTES

[1] Chinua Achebe, *Things Fall Apart.* (London: Heinemann, 1958); *Things Fall Apart.* Directed by Hans Jürgen Pohland. Cine 3 (Berlin/West), Calpenny Nigeria Films Limited (NG), Nigram (US), 1971. Film; *Things Fall Apart*. Directed by David Orere. Nigerian Television Authority, 1987. Television Series

[2] Joe Otterson, "Idris Elba to Star in 'Things Fall Apart' TV Series From A24, Elba's 22Summers, David Oyelowo (EXCLUSIVE)" Variety Magazine, September 26, 2024 https://variety.com/2024/tv/news/idris-elba-things-fall-apart-tv-series-a24-david-oyelowo-1236156154/

[3] Bernardo Atxaga, *Obabakoak*. Donostia: Editorial Erein, 1988; *Obaba, directed by* Montxo Armendariz. Oria Films, 2005.

[4] John Hopewell, "Armendariz to lense 'Obaba' magic in fall", Daily Variety Gotham, January 30, 2004, 36

[5] Pierre Loti, *Ramuntcho* (Paris: Calmann-Lévy, 1897); *Ramuntcho*. Directed by Jacques de Baroncelli. Pathé Frères, 1919. Film; *Ramuntcho.* Directed by René Barberis.. F.I.C., 1938. Film.; *Ramuntcho*. Directed by Pierre Schoendoerffer. Films Georges de Beauregard, 1959. Film.; *The Marriage of Ramuntcho*. Directed by Max de Vaucorbeil. Films de France, 1947. Film

[6] see Kammampoal Bawa, Siro Essobiyou, and Kombate Likambantién. "Folklore and Cultural Identity: a Study in Chinua Achebe's *Things Fall Apart*." European Journal of Literature, Language and Linguistics Studies 7, no. 2 (2023): 26-42; and Snežana Vuletić, "Constructing Alternative Narratives, Triggering Cultural Change: Functions and Emplotment of Igbo Folklore in Chinua Achebe's Things Fall Apart (1958) and Arrow of God (1964)." REAL 32, no. 1 (2016): 269-288

[7] Gerard Genette, *Narrative Discourse: An Essay in Method*. Translated by Jane E. Lewin. (Ithaca, NY: Cornell University Press, [1972] 1980)

[8] Joseph Conrad, *Heart of Darkness* (London: Blackwood's Magazine, [1899] 1902)

[9] Reproduced in Chinua Achebe "An Image of Africa: Racism in Conrad's Heart of Darkness." In *Hopes and Impediments: Selected Essays, 1965-1987.* By Chinua Achebe, 1-13, London: Heinemann 1988

[10] Andrew Griffiths, "Seeking the Sources of Heart of Darkness: the African Narratives of late-Victorian Explorers and Journalists." Continents manuscrits. Génétique des textes littéraires–Afrique, Caraïbe, diaspora 11 (2018): 1-17, at 7-12; Henry Morton Stanley, *Through the dark continent: or, the sources of the Nile, around the Great Lakes of Equatorial Africa, and down the Livingstone River to the Atlantic Ocean*. (London: Sampson Low, 1889); Henry Morton Stanley, "How I Found Livingstone." in *Nineteenth-Century Travels, Explorations and Empires,* Part II vol 7, edited by Peter Kitson and William Baker, 153-215. (NY & London: Routledge, [1872] 2004); Henry Morton Stanley, "In Darkest Africa." In *Nineteenth-Century Travels, Explorations and Empires*, Part II vol 7, edited by Peter Kitson and William Baker, 309-332. (London: Routledge, [1890] 2004).

[11] Chinua Achebe "An Image of Africa: Racism in Conrad's Heart of Darkness." In *Hopes and Impediments: Selected Essays, 1965-1987.* By Chinua Achebe, 1-13, (London: Heinemann 1988).

[12] *Heart of Darkness.* Directed by Nicholas Roeg. Turner Pictures, 1993. Film; *Apocalypse Now*. Directed by Francis Coppola. Omni Zoetrope, 1979. Film

[13] Ronald Bogue. "The Heartless Darkness of 'Apocalypse Now'." The Georgia Review 35, no. 3 (1981): 611-626, at 618-9

[14] Ronald Bogue, ibid, 619-20

[15] Ronald Bogue ibid, 625-6

[16] David Zane Mairowitz and Catherine Anyango Grünewald. *Heart of Darkness—A Graphic Novel*. (London: SelfMadeHero, 2010)

[17] Rachel Cooke, "Heart of Darkness by Joseph Conrad, David Zane Mairowitz and Catherine Anyango", Guardian Reviews, September 5, 2010, https://www.theguardian.com/books/2010/sep/05/heart-of-darkness-graphic-novel

[18] Michel Faber, "Heart of Darkness by Joseph Conrad, adapted by Catherine Anyango and David Zane Mairowitz", Guardian Book Reviews, September 25, 2010
https://www.theguardian.com/books/2010/sep/25/heart-darkness-conrad-anyango-mairowitz

[19] Peter Kuper, *Heart of Darkness* Graphic novel, (New York: W. W. Norton & Company, 2019)

[20] Robert Elder, "Heart of Darkness", The Comics Journal Reviews, October 17, 2019,
https://www.tcj.com/reviews/heart-of-darkness/

[21] Etelka Lehoczky, "Graphic Adaptation Of 'Heart Of Darkness' Takes On Canonical Racism, Artfully", NPR Book Reviews, November 10, 2019 https://www.npr.org/2019/11/10/777675526/graphic-adaptation-of-heart-of-darkness-takes-on-canonical-racism-artfully

[22] Andrew Griffiths, "Seeking the Sources of Heart of Darkness: the African Narratives of late-Victorian Explorers and Journalists." Continents manuscrits. Génétique des textes littéraires–Afrique, Caraïbe, diaspora 11 (2018): 1-17. at 3 & 12

[23] Ronald Bogue "The Heartless Darkness of 'Apocalypse Now'." The Georgia Review 35, no. 3 (1981): 611-626. at 613-4

[24] Richard Berrong, "'Heart of Darkness' and Pierre Loti's 'Ramuntcho': Fulcrum for a Masterpiece." The Conradian 35, no. 1 (2010): 28-44. at 43

[25] see Ur Apalategi "La evolución romanesca del sujeto vasco: negociaciones literario-ideológicas entre la estrategia de diferenciación y el deseo de homologación." 452ºF. *Revista de Teoría de la literatura y Literatura Comparada* 9 (2013): 56-77.

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THE ROLE OF GAMIFICATION IN INDUSTRY 4.0: ANALYSING THE DICHOTOMY BETWEEN SHALLOW AND DEEP GAMIFICATION

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INTRODUCTION

The advent of Industry 4.0, characterized by the integration of digital technologies such as the Internet of Things (IoT), artificial intelligence (AI), and robotics into manufacturing processes, has heralded a new era of industrial operations. This paradigm shift, often described as the "fourth industrial revolution," emphasizes the creation of smart factories capable of performing automated tasks with a high degree of efficiency and adaptability.[1] As a result, the workforce is increasingly required to adapt to rapidly changing technologies, which present significant challenges in terms of skill development and worker engagement.

In this context, gamification, defined as the application of game-like elements in non-game settings, has emerged as a potential solution to enhance motivation, performance, and learning.[2] In particular, its integration within Industry 4.0 environments presents both opportunities and challenges for optimizing worker productivity and fostering engagement in training and work processes. This article seeks to explore the relationship between shallow and deep gamification in Industry 4.0 settings, examining how these two forms of gamification can influence work environments and employee performance.

Understanding Gamification in the Context of Industry 4.0

Gamification is a concept that encompasses the integration of game mechanics, such as points, badges, and leaderboards, into non-game environments with the objective of modifying behaviors and augmenting engagement.[3] In industrial settings, the application of gamification is used to incentivize employees, enhance training protocols, and optimize operational performance by embedding elements typically associated with gaming. By incorporating these game-like features, organizations seek to craft work environments that are both more stimulating and fulfilling, thereby fostering a dual motivation structure that engages employees through both extrinsic and intrinsic incentives.[4]

In contrast, Industry 4.0 represents the transformative process currently reshaping the manufacturing sector, driven by the widespread adoption of advanced digital technologies such as automation, artificial intelligence (AI), and machine learning.[5] This paradigm shift is designed to elevate operational efficiency, refine production workflows, and enable real-time, data-driven decision-making. The introduction of such technological innovations has the potential to significantly optimize

the manufacturing processes, ushering in an era characterized by greater automation, precision, and interconnectedness across the production landscape.[6]

The fusion of gamification with Industry 4.0 technologies presents an opportunity to enhance not only the functional performance of industrial operations but also the level of employee engagement.[7] The gamification of work environments can be seen as a catalyst for stimulating both cognitive and behavioral responses in workers, thereby contributing to a more dynamic and participatory atmosphere within the workplace. By fostering an interactive environment that integrates both technological advancements and game mechanics, organizations can cultivate a more motivated and engaged workforce.[8]

The potential of gamification to bolster both motivation and performance in Industry 4.0 contexts lies in its ability to harmonize extrinsic and intrinsic motivators. While extrinsic rewards, such as tangible incentives or public recognition, can encourage short-term engagement, intrinsic motivators, driven by the satisfaction derived from mastering tasks or overcoming challenges, tend to have a more sustainable and enduring impact. Thus, the strategic application of gamification in industrial settings has the capacity to create a work environment that not only enhances productivity but also fosters long-term employee satisfaction and professional growth.[9]

Shallow Gamification vs. Deep Gamification

A pivotal distinction in the deployment of gamification lies in the dichotomy between shallow and deep gamification.[10] Shallow gamification refers to the superficial incorporation of game mechanics, such as points, rewards, badges, and status indicators, which are applied externally to pre-existing processes.[11] This form of gamification primarily seeks to motivate employees through extrinsic mechanisms, wherein tangible incentives or recognition are used to encourage specific behaviors or achievements. While shallow gamification can be effective in the short term by providing immediate incentives for engagement, its long-term efficacy is often limited. This is largely due to the tendency of external rewards to experience diminishing returns, as individuals may become desensitized to the rewards over time, thereby failing to derive deeper satisfaction from the activities themselves.

In contrast, deep gamification represents a more integrative and substantive approach, wherein game-like elements are embedded into the core structure of the work processes themselves.[12] Rather than merely layering rewards or status indicators onto existing workflows, deep gamification reshapes the work environment by incorporating challenges, skill-building opportunities, and interactive elements into the tasks that employees perform. This approach is aligned more closely with intrinsic motivation, wherein employees engage in tasks not merely for external rewards but because the tasks themselves provide inherent value and satisfaction. By fostering such an environment, deep gamification enhances the potential for long-term engagement, as it encourages workers to derive fulfillment from the work process itself rather than from external incentives.

The concept of deep gamification frequently draws on the flow model of psychological engagement, a theoretical framework introduced by Mihaly Csikszentmihalyi.[13] According to the flow model, individuals achieve a state of optimal engagement when the level of challenge presented by a task is finely balanced with their existing skill level. In this state of flow, individuals experience heightened focus, motivation, and productivity. In the context of gamified work environments, deep gamification facilitates this flow state by continually presenting employees with tasks that are appropriately challenging without exceeding their abilities. By adjusting the difficulty of tasks in this manner, deep gamification maintains a delicate balance between challenge and competence, which is essential for sustaining long-term engagement.

Deep gamification enhances both the quality and sustainability of employee performance by continually aligning tasks with an individual's evolving skill set, fostering ongoing personal and

professional development. This approach contrasts with shallow gamification, which relies on external rewards and often neglects the fundamental growth of an employee's abilities. By integrating deep gamification, the work itself becomes intrinsically rewarding, leading to sustained engagement and motivation over time.

The Role of Motivation in Gamification

The effectiveness of gamification largely depends on the types of motivation it seeks to cultivate. Motivation can be broadly classified into two categories: extrinsic and intrinsic.[14]

- **Extrinsic motivation** is driven by external factors, such as rewards, recognition, or the desire to avoid negative outcomes. In a gamified work environment, extrinsic motivation may manifest through mechanisms such as points, badges, or other forms of material or social rewards. While extrinsic motivation can provide a short-term boost in engagement, its long-term effectiveness tends to wane as employees become accustomed to the rewards and their novelty diminishes.
- **Intrinsic motivation**, on the other hand, arises from the inherent satisfaction of engaging in an activity itself. It is the result of personal enjoyment, mastery, or the pursuit of a meaningful challenge. Deep gamification strategies are designed to foster intrinsic motivation by creating work tasks that are inherently interesting, challenging, and fulfilling. This type of motivation is generally more sustainable and results in greater long-term engagement and satisfaction.

The balance between extrinsic and intrinsic motivation is crucial to the success of gamification initiatives.[15] If an organization relies too heavily on extrinsic motivators, it risks creating an environment where employees are primarily driven by external rewards, rather than by the intrinsic satisfaction of their work. Conversely, an overemphasis on intrinsic motivation without sufficient external incentives may result in a lack of concrete goals or rewards, which can diminish overall motivation. Therefore, an effective gamification strategy must integrate both forms of motivation in a balanced manner, ensuring that employees are motivated by both external rewards and internal fulfillment. This approach is called balanced gamification.

The Flow Model and Its Application in Gamification

The flow model of psychological engagement offers pertinent insights into the development of effective gamification frameworks.[16] Flow is a psychological state wherein individuals become completely absorbed in an activity that is both adequately challenging and within their capacity to complete, thereby enhancing their focus, engagement, and overall enjoyment. In relation to gamified work environments, this model can be utilized to create tasks that dynamically adjust to the skill levels of employees, ensuring that the complexity of these tasks is neither too simplistic nor excessively difficult, thereby maintaining an optimal level of engagement.

Within the realm of digital games, the flow model is typically operationalized by modulating the difficulty of tasks as the player progresses through different stages, ensuring that challenges evolve in tandem with the player's increasing competence.[17] This principle can be directly transposed to industrial environments by designing tasks that incrementally grow in complexity and difficulty. Such an approach encourages employees to expand their skill set while preserving their engagement levels. The gradual increase in task complexity, when effectively calibrated, can facilitate an ongoing process of skill development, which is fundamental to sustaining high levels of engagement and focus.

Moreover, the flow model underscores the critical role of feedback, which functions as a mechanism through which individuals can assess their progress and recalibrate their efforts accordingly. In gamified work settings, the provision of real-time feedback enables employees to continuously gauge their performance and make adjustments as necessary, ensuring that they remain within the flow state.

The timely and constructive nature of feedback is essential for fostering an environment where employees are motivated to refine their skills and sustain their involvement in tasks, which, in turn, leads to increased productivity.[18]

Learning While Working (LWW) and Gamification in Training

The concept of Learning While Working (LWW) represents an application of gamification within industrial environments, wherein learning opportunities are integrated into the workplace to facilitate skill acquisition concurrent with job performance.[19] This approach contrasts with traditional training paradigms that require employees to leave their workstations to engage in external training sessions. By embedding learning directly within the workflow, LWW enables the simultaneous development of competencies and task execution, thereby enhancing overall learning efficiency.

A fundamental aspect of LWW is the use of gamified planning systems within industrial production environments. Such systems are designed to provide structured training while employees engage in their regular duties, ensuring that learning occurs in a continuous and adaptive manner. These systems typically incorporate mechanisms that adjust task difficulty in response to an individual's demonstrated proficiency, thereby maintaining an optimal level of challenge. This dynamic ensures that employees remain engaged in the learning process while progressively enhancing their competencies in alignment with organizational objectives.

A key characteristic of gamified planning systems is the provision of real-time feedback on employee performance.[20] This immediate feedback loop allows workers to assess their progress, identify areas requiring improvement, and make necessary adjustments without significant disruption to their workflow. The continuous nature of this feedback contributes to an environment that supports sustained engagement and incremental skill development. By systematically integrating performance monitoring and responsive learning mechanisms, gamified systems facilitate a more efficient and tailored approach to workforce training.

Furthermore, the implementation of gamification in LWW enhances worker engagement by introducing interactive and motivational elements into the learning process. The inclusion of structured challenges, rewards, and progression systems fosters a more immersive and stimulating training environment. As a result, employees are encouraged to persist in their skill development efforts, which can lead to improved individual performance and overall organizational productivity. The integration of gamified learning frameworks within industrial settings thus represents a significant advancement in workforce development strategies, promoting both efficiency and motivation in skill acquisition processes.

The Future of Gamification in Industry 4.0

As Industry 4.0 progresses, the incorporation of gamification is expected to become increasingly integral to the functioning of modern organizations. Technological advancements, particularly in fields such as artificial intelligence (AI), machine learning, and data analytics, will enable organizations to develop more tailored and individualized gamification experiences. These technologies facilitate the customization of tasks, challenges, and rewards to suit the specific needs and capabilities of individual employees. Such personalized gamification systems allow organizations to create work environments that are not only more engaging but also more conducive to optimizing employee development and maximizing productivity.[21]

Furthermore, the integration of gamification with other cutting-edge Industry 4.0 technologies, such as augmented reality (AR) and Internet of Things (IoT)-enabled devices, has the potential to significantly enhance the effectiveness of gamified work environments.[22] By combining these technologies with gamification, organizations can provide employees with immersive, interactive

training experiences that are more engaging and effective than traditional methods. This convergence of technologies could open up new avenues for the development of work environments where learning and performance enhancement are seamlessly integrated into everyday tasks, creating a more dynamic and responsive workplace.

The application of augmented reality (AR) in gamification, for instance, could offer immersive experiences that allow employees to interact with 3D visualizations and simulations in real-time. This could facilitate more hands-on training experiences, where employees can practice tasks in a controlled virtual environment before performing them in the real world. Such training methods could enhance the retention of knowledge and improve skill acquisition by providing employees with immediate feedback and the ability to rehearse complex tasks in a risk-free setting. Similarly, IoT-enabled devices could provide real-time data on employee performance, enabling more precise adjustments to gamified systems and providing workers with immediate feedback on their progress.

By leveraging these technologies, organizations can foster a work environment that emphasizes continuous learning and performance optimization. Real-time monitoring and adaptive gamification systems can facilitate a culture of ongoing improvement, where employees are consistently challenged to enhance their skills and engage with their tasks. The integration of gamification with AI, machine learning, AR, and IoT not only increases engagement but also provides organizations with actionable insights that can inform operational decisions and improve overall efficiency.[23]

Ultimately, the integration of gamification with Industry 4.0 technologies holds the potential to reshape the work environment by creating a more interactive and engaging experience for employees. By incorporating personalized, real-time feedback and immersive training technologies, organizations can drive continuous improvement in both individual performance and organizational success. This combination of technologies and gamification strategies will likely play a crucial role in shaping the future of work, making it more adaptive, efficient, and employee-centric.

CONCLUSION

The integration of gamification within the framework of Industry 4.0 presents considerable potential for enhancing worker engagement, fostering skill development, and improving overall productivity. By strategically incorporating both shallow and deep gamification elements, organizations can construct work environments that effectively motivate employees through a combination of extrinsic rewards and intrinsic satisfaction. This approach ensures that employees are not only incentivized by tangible rewards but are also engaged in the work itself, which can lead to more sustained motivation and long-term performance improvement. As digital technologies continue to progress, the mechanisms through which gamification can influence the industrial workforce are expected to become increasingly sophisticated and personalized.

The primary objective of gamification in this context extends beyond merely enhancing the enjoyment of work. Its core aim is to establish a meaningful and productive work environment that promotes both individual growth and organizational success. By facilitating an environment where employees are both challenged and rewarded, gamification can contribute to a more sustainable work culture that aligns personal achievements with broader organizational objectives. Ultimately, gamification seeks to create a work environment that is not only engaging but also conducive to the development of competencies and the achievement of long-term business goals.

NOTES

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SCREENS ON SURFACE, PAST IN PROJECTION: THE SPECTACLE OF THE THÉÂTRE DES LUMIÈRES AT SEOUL'S WALKERHILL HOTELS & RESORTS

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INTRODUCTION

Focusing on the exhibition space of Théâtre des Lumières at Walkerhill Hotels & Resorts (WHR) in Seoul, South Korea, this paper examines the evolving role of spectacle as mediated through screen-based media. In particular, the paper analyzes the transformation of the original Walkerhill Theater, which opened in 1963, into its contemporary form as an immersive media art venue and the interplay between past and present spectacles as materialized through the venue's screen surfaces. By investigating both continuities and discontinuities in exhibition content and theatrical spatial configurations, this paper elucidates how WHR, as a symbolic space, extends its politics of urban spectacle by reconstructing its materiality, visuality, and experience of the past. In conclusion, the paper will show that the retrospective imagery and exhibition compositions articulated through WHR's screen surfaces reflect deeper tensions in representing Korea's complex modernization history.

Walkerhill Hotels and Resorts and Seoul's Modernization

Marking its 60th anniversary in 2023, WHR was established in 1963 as one of Korea's first modern hotels. Situated in Seoul's Gwangjin District, on the eastern periphery of the city and nestled around Acha Mountain with a view of the Han River, WHR was envisioned from the outset as a U.S.-style luxury resort.[1] Aligned with the Park Chung-hee administration's state-led Economic Development Plan, tourism was strategically positioned as a key industry to attract foreign currency. In tandem with large-scale national projects such as the construction of the Gyeongbu highway,[2] the government established the International Tourism Organization (current Korea Tourism Organization) in 1962 and initiated the development of WHR, prioritizing accommodations for UN forces and foreign visitors. Notably, the hotel was named after Walton H. Walker, a U.S. military commander recognized for his contributions during the Korean War, symbolizing South Korea's geopolitical alignment.

From its inception, the grand opening of WHR signified South Korea's entrance into the postcolonial era, encapsulating its ambitions for modernization and urbanization. Before its official opening, WHR was heavily promoted through serialized news reports, emphasizing its role as a core site where visitors could "experience Korea" as "the heart of the pleasure kingdom."[3] Beyond functioning as a leisure destination on the outskirts of Seoul, WHR was given the role of an urban spectacle, proclaiming itself as "the largest entertainment hub in the East"[4] to captivate and attract foreign

visitors. The prominence of WHR as a pioneering site of Seoul's tourism spectacle was underscored by its high-profile opening events, which featured the renowned jazz musician Louis Armstrong[5] and the Honey Bee Show, an exclusive dance troupe formed for its theater, the Walkerhill Theater.[6]

Walkerhill Theater and Théâtre des Lumières

Formerly known as the Pacific Theater, the Walkerhill Theater was the first entertainment venue in South Korea to integrate live performances with a tourist hotel. As an "exceptional space," its spectacles evoked a sense of the extraordinary and the exotic for local audiences and foreign visitors.[7] Following the privatization of WHR in 1973 by Sunkyong (now SK Group), one of South Korea's major conglomerates, both the hotel and the theater space became more widely accessible to the public. The hotel later expanded its entertainment business by introducing the Kayageum Theater Restaurant, which combined performance spectacles with fine dining. After multiple renovations, the venue was officially renamed Walkerhill Theater in 2008. Despite its prestigious past, however, declining audience numbers and financial losses led to the theater's closure in 2012.

Figure 2. The entrance of Théâtre des Lumières. May 23, 2023. Photo by the author.

A decade later, in 2022, the theater was reopened as Théâtre des Lumières, transforming the space by incorporating large-scale indoor projection screens to host media art exhibitions. Théâtre des Lumières is part of a global network of digital art centers coordinated by Culturespaces,[8] a France-based cultural operator with projects in Paris, New York, Amsterdam, and other major cities. Following the massive success of its first project in South Korea, Bunker des Lumières in Jeju, Culturespaces partnered with WHR in Seoul to establish its second Korean venue under a new name. Unlike many other Culturespaces projects, which have primarily repurposed disused sites, Théâtre des Lumières retains its historical function as a theater while integrating modern stage facilities with digital art installations. As of 2024, the theater hosted five exhibitions, each exploring different themes and programs under the broader vision of merging immersive art, innovative technology, and historical regeneration.[9]

With its most recent renovation, Théâtre des Lumières has expanded its role as an urban cultural hub, accommodating diverse cultural events. In 2022, the venue was opened to football fans during the Qatar World Cup, integrating the spectacle of immersive screen projections with a global mega-event. Additionally, the K-pop group NMIXX utilized the theater space and its projection screens as the backdrop for a performance video, while another K-pop group, NCT, collaborated with Théâtre des Lumières for a special show, attracting a significant number of fans to the historic venue. These cases illustrate how Théâtre des Lumières has evolved into a focal site for contemporary cultural spectacles, characterized by large-scale screen projections that redefine the theater's spatial experience.

Figure 3. The exhibition space of Théâtre des Lumières. May 23, 2023. Photo by the author.

SCREEN SPECTACLES IN THE THÉÂTRE DES LUMIÈRES

Screen as a Surface

The concept of a surface refers to what is perceptible at a superficial level, or more precisely, what Giuliana Bruno describes as "a generative and defining aspect of the aesthetics of modernity."[10] This notion of surface aligns with Siegfried Kracauer's concept of 'surface-level expression' in his seminal essay "The Mass Ornament," which argues that these serve as "expressions of the tendencies of a particular era," materializing in distinct aesthetic forms.[11] He further asserts that surface-level expressions "provide unmediated access to the fundamental substance of the state of things," with their meaning contingent upon the way they are interpreted.[12] Kracauer's focus on the superficial phenomena of modern urban life—including hotel lobbies, movie theaters, travel, dance, and city maps—directs attention to the quotidian elements that often go unnoticed yet visually aesthetic, thus requiring critical deciphering. In this regard, Kracauer's perspective provides a crucial analytical lens for examining the 'surface' of Théâtre des Lumières, which is enveloped by screen projections while preserving its historical traces. By exploring how retrospective imagery and exhibition themes are mediated through the venue's screen surfaces, this paper examines the broader tensions surrounding the re-expression, if not representation, of the theater's legacy and the complexities of national memories.

The Materiality of the Past

Théâtre des Lumières is located on the basement floor of the hotel, maintaining its original two-story structure with a total area of 3,305 square meters. Prior to its transformation from Walkerhill Theater, the space was distinctly divided into a performance stage and designated seating for the audience. However, this spatial division has been entirely reconfigured in its current form, where no clear boundary exists between the exhibition area and the audience space. As the theater now presents itself, it is covered up by high-definition projections and 3D sound systems, offering an immersive visual experience.[13] What was once an exceptional theater space filled with live dance performances has been reimagined as an immersive 'screen space' redefining the artistic encounter through large-scale digital projections.

A crucial aspect of this transformation is the material evidence integrated both inside and outside the exhibition space. Before entering the exhibition, visitors encounter archival material displays—including brochures, posters, and press images—which provide historical context on the legacy of WHR (Figure 3). Along the entrance, furthermore, original theater set pieces are displayed, evoking a museum-like atmosphere and reinforcing the venue's historical significance. Within the exhibition

space, a grand chandelier, preserved in its original form, hangs from the ceiling, while former stage consoles—once used for theatrical effects—are strategically placed throughout the area. By incorporating these historical remnants, the exhibition highlights a sense of continuity between the past Walkerhill Theater and the present Théâtre des Lumières, positioning itself as both a site of cultural memory and a space for contemporary screen spectacle.

Figure 4. Archival displays. May 23, 2023. Photo by the author.

It is important to acknowledge, however, that these historical elements—detached from their original context—offer only a fragmentary representation of WHR's past. While they provide a tangible historical presence for visitors, they do not fully convey the 'real' history of WHR, such as the Park administration's modernization agenda or the micro-histories of the performers and audiences who once animated the space. Although Théâtre des Lumières grants access to both the exhibition and the historical legacy of WHR, the past is selectively recontextualized and partially displayed within a new curatorial framework. Once the lights dim and the projections commence, the material remnants of history become increasingly elusive, perceptible only to those who actively seek them. These selective reconstructions of history ultimately create a new object of spectacle for contemporary audiences while deeper historical narratives remain obscured in the dark.

The Visuality of the Past

Unlike many other theaters, the original Walkerhill Theater was unique for its exclusive performances catered to foreign tourists, its persistent financial struggles, and its theater performers—predominantly Korean female dancers.[14] The synchronized bodily movements of these dancers, often dressed in near-topless costumes, created a visual spectacle that resonates with Kracauer's observations on early 20th-century mass ornaments.[15] Kracauer analyzed the Tiller Girls—a renowned dance troupe that emerged in England in the 1890s—whose precisely synchronized movements and kinetic body formations embodied a distinctive mode of visuality. In his interpretation, the Tiller Girls exemplified the concept of mass ornament, an aesthetic manifestation of modern rationality and mechanized synchronization. A similar phenomenon unfolded in South Korea during the 1960s and 1970s through the performances at Walkerhill Theater, albeit within a distinct sociopolitical framework. These performances, shaped by South Korea's modernization and tourism-driven cultural policies, reveal how spectacle was mobilized as both an economic strategy and a mode of visual consumption.

As these dancers evoked an extraordinary and exotic atmosphere for both local audiences and foreign tourists, growing public fascination was reflected in various cultural representations, such as promotional advertisements for day-trip visits to the hotel[16] and the 1966 film *Let's Meet at Walkerhill* (dir. Han Hyeong-Mo).[17] The film mainly features multiple sequences showcasing musical

performances and stage shows, positioning the hotel as a site of both spectacle and leisure. While its visually striking entertainment created an almost surreal atmosphere, it simultaneously became part of everyday consumer culture. As the Park administration pursued rapid modernization and urbanization policies, WHR and its theatrical performances were embedded within broader discourses of consumerism and exoticism. These rationales were articulated through the aestheticized performances at Walkerhill Theater, where visual spectacle functioned as both a commercial strategy and a reflection of the shifting urban landscape of the era.

Today, however, Théâtre des Lumières has replaced live performances of the dancers with projection mapping, transforming the visuality of the spectacle. By opening the surface of the space with screens and digital projections, the visuality of the past—once embodied through the mass ornament—now resurfaces as a screen-based spectacle. This shift is particularly evident in the exhibition's content, where the opening sequence presents a visual narrative of South Korea's modernization and urbanization. For instance, the sequence juxtaposes archival photographs of Seoul and past shows from the 1970s and 1980s with contemporary cityscapes before transitioning into artworks by Gustav Klimt or Salvador Dalí, which serve as the exhibition's central themes (Figure 4). Lasting only about a minute, this historical montage quickly dissolves into artistic imagery, as if the past is being overlaid with layers of paint. Through these projections, the historical mass ornament is reconfigured into a new form of screen spectacle, producing what can be understood as a contemporary 'surface-level expression.' In this setting, the play of light and image captures the audience's attention and reinscribes past visual formations within the framework of digital spectacle.

Figure 5. Opening sequence of archival photographs. May 23, 2023. Photo by the author.

The Experience of the Past

Thus far, this paper has examined the material and visual transformations of the theater by following their past and present manifestations. One central question that emerges from this analysis concerns the nature of the 'immersive experience' that Théâtre des Lumières claims to offer its audience, as articulated on its official website.[18] The immersive quality of Théâtre des Lumières fundamentally alters the role of the audience. Unlike traditional spectators who engage with a static stage, visitors today encounter a continuous sequence of screen projections that unfold over 50-minute intervals, encouraging them to move freely within the theater space. However, despite this structural shift, the audience's engagement remains selective. The sheer scale of the projections, combined with the physiological limitations of human vision, means that no single viewer can fully grasp the entirety of the visual field at once. This discrepancy raises questions about the nature of immersion itself—whether it fosters deeper engagement or instead reinforces fragmented and partial modes of viewing.

As audiences move through the exhibition space, they actively document their experience by taking photos and videos, visually merging their presence with the projected images. This scene itself, in turn, generates a secondary spectacle, that is, one in which visitors not only consume the exhibition but also become part of its visual narrative. Notably, patterns emerge as individuals follow others,

positioning themselves at specific points and replicating particular framing techniques, perpetuating a repetitive cycle of mediated engagement. In this way, the role of spectacle undergoes a fundamental shift. Whereas the dance performers of the past were once the primary focal point of visual consumption, today's audience has effectively replaced them. Visitors are no longer mere spectators of the show but rather integral components of the exhibition, absorbed into the screen projections and incorporated into the visual field. This dynamic blurs the boundary between observer and spectacle as if situating the audience within the ongoing historical narrative of Walkerhill Theater.

Another critical aspect to examine is the role of installations throughout the exhibition space, which actively encourages audiences to engage in the history of Walkerhill Theater. For instance, designated photo zones near the entrance serve as a visual cue, reinforcing the exhibition's self-referential claim to historical significance (Figure 5). Additionally, visitors are invited to pose in front of mock stages, where screen projections of past dance performances serve as a backdrop. This spatial arrangement implicitly positions the audience as successors to the former performers, as if they are stepping into the historical continuum of the theater.

Figure 6. Photo zone with a mock stage. May 23, 2023. Photo by the author.

Inside the exhibition, a particularly notable space is the Green Room, which initially functioned as a waiting area for performers (Figure 6). Now repurposed as part of the interactive exhibition, it features instructions: "In here, be the main character preparing for the performance." Such installations repeatedly prompt visitors to assume the role of performers, reinforcing the notion that they are not merely spectators but active participants in the spectacle. However, rather than fostering a direct connection with the past, they generate a form of detachment. The exhibition presents a curated and reconstructed version of history, in which the past is selectively staged for contemporary engagement. As a result, while visitors may feel immersed in the theatrical spectacle, their interaction with history remains mediated and performative rather than experiential or deeply connected.

Figure 7. The Green Room. May 23, 2023. Photo by the author.

The historical displays within the exhibition serve as a form of guidance, offering glimpses into the past. Nevertheless, they simultaneously function as barriers, limiting the audience's ability to grasp a comprehensive historical narrative. The selective presentation of history—mediated through screen projections—risks reinforcing a fragmented and partial understanding of the past. Rather than facilitating direct engagement with historical complexity, these mediated spectacles frame history as a consumable visual experience shaped by the logic of exhibition and audience participation.

CONCLUSION: SCREEN SURFACE AND SURFACED HISTORY

The transformations in physical space, visual expressions, and theatrical experience demonstrate that Théâtre des Lumières constructs its contemporary spectacle by reconstructing past spectacles. The interplay between past and present spectacles, as mediated through the venue's screen surfaces, reveals how the historical trajectory of WHR intersects with the politics of urban spectacle within Korea's broader modernization narrative. The sociopolitical contexts, rationales, and micro-histories once embodied within the theater space are now disembodied and rearticulated through the venue's new screen-based environment and its contemporary audience. Hence, the current case epitomizes how contemporary screen surfaces can either amplify or obscure particular sociopolitical and techno-cultural contexts that shape the audience's engagement with history and memory.

Ultimately, such 'immersive' mediation of history through screen surfaces has given rise to what I propose as 'surfaced history'—a mode of historical re-expression in which past events are rendered visually immediate yet remain distanced from their broader sociopolitical contexts. This concept raises critical questions about the role of media spectacles in constructing historical narratives and the implications of experiencing history primarily through screen-based mediation. To what extent does such mediation enable a deeper engagement with the past, and what does it risk producing a superficial, aesthetically driven recollection? These questions are central to understanding the evolving intersections of spectacle, history, and media in contemporary spaces of cultural experience.

As Théâtre des Lumières proclaims, it is "a symbol of the Korean performance domain, reborn with lights."[19] This statement encapsulates the dual nature of the venue's role—both celebrating a historical legacy and reshaping it for the audiences in the present day. The case not only serves as a core location of urban spectacle but also highlights and reveals intricate dynamics of how media screens are incorporated into historical spectacles. Given their close ties to specific historical contexts, however, it is difficult to overlook how these screens are articulated through architectural spaces and their users. By critically engaging with such media spectacles, we can deepen our understanding of the interplay between screen, space, and experience in contemporary society, as screens now cover the surface of our everyday lives in more intimate ways.

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I WAS NEVER THERE: THE PAN OPTICS OF SURVEILLANCE

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INTRODUCTION

This paper is an exploration of surveillance through the paradigm of my artistic research and practice. Referencing and adopting facets of Debord's definition of the spectacle, I study imagery made with CCTV cameras. These observations watch the seemingly inconsequential, the everyday and moments of transient beauty across the world. The resulting body of images forms an artistic dialogue between myself, CCTV cameras and my digital wanderlust. Although made as aesthetic artefacts, the trajectory of this work challenges critical geography and surveillance capitalism, offering new values and interpretations through a form of optical poetry.

Employing what Kate Lecky described as 'user-friendly technology', my inquiry explores the world through live open-source CCTV images, accessed via apps on a mobile phone; a methodology that utilizes the commodification of surveillance. Owned by a large section of the world's population, small enough to fit into most pockets and accompanying almost our every journey, the mobile smart phone is a constantly evolving piece of technology which 'opens the same world up to the excluded and powerful alike'.[1] It utilizes technologies which are autonomous in their availability, a digital democracy Lecky describes as 'a space within which dwell ever-increasing numbers of individuals from diverse classes, educational backgrounds, races, nationalities, genders, and political, sexual, or religious orientations'.[2] Access to these live feeds transforms the phone into a panoptic device, and it is through this lens that I become an optical voyager, navigating physical, geopolitical and digital spaces. The globalization of transmitted data thus becomes a digital anthropologic survey for the 21st century.

Figure 1. Mark Edwards: 'Xapa, Japan', 2024. CCTV image.

Aeriality

Keith Guzik writes in 'Grasping Surveillance', the original definition of surveillance is to 'watch-over'.[3] Expanding on this definition, modern surveillance systems are often the projection of current technology hovering in the air, 'sociotechnical assemblages of the vertical', offering a distinctive aeriality in its observations, Figure 1.[4] The cameras I access from CCTV apps employ this 'hovering' vantage point. Acting as static distant observers, they focus on communities and locations geographically disparate in their spread: American cities and small towns; the cultivation of an orchard in Japan; a housing complex in Tehran; building sites across Europe and a nest for returning storks and their fledglings. And although filmmakers and visual artists have incorporated the tropes of surveillance in their work, the world I view was initially the product of a sympathetic intrusion that has subsequently evolved into an exploration of the liminal territory between Arendt's 'spaces of appearance' and Foucault's 'spaces of surveillance'.[5]

Art & Surveillance

The historical perception of surveillance as a tool of institutional or political power, an observational mechanism which Zimmer refers to as a 'voyeuristic predator', is now more nuanced, open to interpretation; another tool to observe global concerns and the homogeneity of cultures and the landscapes we live in.[6] Despite this, there is a residual tension between surveillance and democracy. Peter Manning writes, 'privacy and human rights must be defended in democracies, yet democracies to defend themselves are moving evermore toward systematic data gathering and use in the processes of ordering'.[7] It's a space in which cultural theorists and artists navigate with sensitivity or confront directly.

Figure 2. Mark Edwards: 'Teberda, Russia, 2023' CCTV image.

Catherine Zimmer writes: 'Despite the historical understanding of surveillance as an instrument of institutional or political power, it is by now commonplace to note that surveillance—in practice, in representation, and in critical discourse—is no longer something that can be discussed in the mode of a purely unidirectional or top-down activity in which surveillance is something done by the state'.[8] She continues to outline a new mode of engagement away from what is essentially Foucault's theory

to adopting a position of 'synopticism'. Foucault's panopticism describes this 'top-down' form of surveillance where a few watch the many, whereas 'synopticism, refers to a "many-to-few" dynamic in which the masses observe and monitor a small elite group or individuals'.[9] However, the unrestrictive access to modes of surveillance, such as CCTV cameras, has democratized its scope to a point where the few can now watch the few, Figure 2.

In his essay, 'Surveillance as Cultural Practice', Torin Monahan, observes that the discourses around surveillance methodologies and practices have expanded across multiple disciplines. Once the terrain of sociologists it is now studied by academics across science, cultural, political and geographic fields.[10] The resulting re-orientation and re-evaluations have brought new interpretations on the politics of surveillance, fostering 'sociological imagination in the deepest sense of the term'.[11] Within this expanding realm of scholarship there is a focus on surveillance within the sphere of social and cultural practice. This, as Monahan clarifies, is not a study of technologies per se, but a study of surveillance through models of art and media.[12] This brings surveillance and cultural-based narratives, broadly into Debord's orbit of the 'spectacle', as they become an intellectual and aesthetically driven practice in the hands of visual artists.

The 21st century manifestation of Walter Benjamin's essay on physiognomy ('Arcades Project',1927–1940), according to Nitzan Lebovic, is the latent system of biometric surveillance pervasive in our everyday lives. He writes: 'the wide spread of these systems proves that the modern aestheticization of politics, which lasted from the eighteenth century to the twentieth century, has turned into a system of hidden and fragmented biological control'.[13] An often-cited justification for such immanent state monitoring is security. What Lebovic refers to as an 'assumed consensus', is often only challenged and confronted by the cultural sector.[14] Artists have increasingly become interested in modes of surveillance and their adaptation into works which test conventions and often attempt to bring about recognition and change; 'artists provide imaginative resources that oftentimes channel latent concerns and anticipate future worlds in ways that social scientists would have difficulty doing without deviating from disciplinary norms' writes Torin Monahan.[15] The mechanics of state intrusion is now a tool utilised by artists. In her essay, 'Friendly Social Surveillance', there are references to the facial recognition-based work of Tsvetkov's ('Your Face is my Data', 2016) and Trevor Paglen and Kate Crawford's #ImageNetRoulette, each registering the tension between governmental control and visual inquiry.[16] By positioning data and surveillance technologies within the orbit of a 'cultural agenda', artistic practices return the gaze back on to the observers. In an interview with Nick Houde, Paglen outlines the questioning role of the artist: 'as an artist, all you can do is tell a story about why we should think about placing limits on how these technologies are going to be used'.[17]

THE FRACTURE OF AN EMBODIED SPACE

Shifting away from data-dependent systems. What could be described as data mining, the anthropologist Frances E. Mascia-Lees argues that, in ethnographic studies, digital media has changed the engagement with place in a way that replaces experience with reproductions, leading to a fracture with embodied spaces.[18] Unlike Mascia-Lees, who found a sense of placefulness when visiting sites only before experienced in photographs, I found a formal interest in the CCTV images themselves, and the fact that I could orientate this gaze globally.[19] These images became a substitute for encounters with environments distant in their physical and cultural proximity – echoing Benjamin's prediction that reproductions would replace the 'aura' of reality.[20] Despite their objective scrutiny of a surveyed landscape, I found a poetry in the images, what Walter Benjamin refers to as photographs 'magical value'. [21] To paraphrase Mascia-Lees: they enhanced the mystique of place.[22]

Perhaps ambitiously on my part, the inquiry that constitutes 'The Pan Optics of Surveillance', is an attempt to reflect what Charles Lesh describes as the 'broader move toward rethinking the relationship

between space and time within systems of meaning'.[23] What could be described as forms of urban and ecological anthropology, Jennifer Burris, in her article 'The Aesthetics of Architecture: Philosophical Investigations into the Art of Building', references Marc Augé's 'non-spaces' as a way of reading of contemporary urban spaces. What Augé characterizes as the topography of the peripheries, the backdrop to our everyday experiences, Burris establishes as the cultural framework underpinning the narrative of much 20th century photography. As the photographic medium enters a period of what has been described as, 'post-photography', Burris discusses a number of contemporary photographers who need to distance themselves from the physical proximity and materiality of spaces; a removal replaced by an emphasis on 'presenting a vision of the urban landscape as a stage set' resulting in 'optical modes of both entertainment and surveillance that invisibly govern the urban environment', Figure 3.[24]

Figure 3. Mark Edwards: 'Mexicali, Mexico, 2020. CCTV image.

Burris's paper also recognizes that this 'topographical approach recalls nineteenth-century urban photography in that it depicts the city as 'architectonic, unoccupied and devoid of human energy', what she describes as 'the urban landscape as deserted space'.[25] While in my CCTV images there are tropes of historical and modern topographical photography, there is in addition, through the employment of a remote camera, resulting in a lack of phenological scrutiny and reduction in any form of topophilia. Through these mediated digital spaces the images adopt the attributes of a stage-set via the smart phones screen, from which we the viewers observe a 'performance' in real time. Contextualizing traditional photographic methodologies within the framework of contemporary digital approaches Catherine Zimmer writes: 'This rhetoric of immediacy is still paramount, perhaps even more so, in relation to digital imaging, with the seemingly instantaneous production and transmission of an image via mobile phone and internet'; a practice extended through openly available surveillance technologies.[26] It marks the significant shift from an analogue based inquiry to one reliant on data and algorithms.

The Voluntary Panopticon

While many CCTV cameras hide in plain sight, there is a more overt system of observation. Sunburst, a small American town in Montana, adopts a concept of what is called the 'Voluntary Panopticon'. Its world, and the everyday activities of its population, can be viewed from open source CCTV channels and mobile phone apps, in addition to posting a link to their live web-cam via the town's website, even allowing viewers to control its functions in real time. This seemingly overarching communal consent could, it has been argued, bring a sense of normalization to being observed, albeit from a singular camera's birds-eye perspective. Referred to as 'community oversight', 'the new power is no longer the power of one person but the "power of the eye" ' writes Onur Bayrakçi.[27] And this 'eye' is an all-seeing technological cyclops with its 360-degree perspective and powerful zoom capabilities available to all, Figure 4.

This **'**voluntary panopticon' is not unprecedented. Matthijs Gardenier's essay discusses community schemes of neighborhood watchers in France; the citizen participation scheme and a group run through a website called the *voisins vigilants*. This form of what he describes as 'watchful citizenship', broadly operates under the umbrella of providing 'security' and in the second case, as the name suggests, a form of intervention; 'surveillance reflex'.**[28]** However, as his research indicates interventions rarely happen. Furthermore, his finding demonstrates that often such groups are established in communities that do not feel threatened by crime.

Figure 4. Mark Edwards: 'Sunburst, USA', 2024. CCTV image.

This paradoxical situation leaves such schemes in a position of moral ambiguity and renders them venerable to accusations of 'accumulating social capital for future political use' in addition to the 'maintenance of an existing order, from which the mobilised individuals benefit'.**[29]** In her essay, **'**The Relative Moral Risks of Untargeted and Targeted Surveillance', Katerina Hadjimatheou outlines the moral and ethical jeopardy of such a surveillance strategy: 'privacy should be treated as an important value of freedom and should be limited or interfered with only to the extent that is proportionate to the protection of other equally or more important values or interests'.[30] Proportion is an ambivalent word however, and is defined by shifting and porous definitions. It is a question which Kevin Macnish attempts to clarify: what constitutes an equilibrium between respectful and invasive surveillance?[31]

Ultimately, it is a shifting target, but, as Macnish acknowledges, 'involves balancing the relevant benefits and harms', and that is bound up in legislature and shifting political agendas.[32]

Absorption

In Sunburst, the ability to surreptitiously track and observe strangers is an extension of Michael Fried's arguments on absorption, where we as observers become immersed in a stranger's activities.[33] When controlling the Sunburst camera, I found myself following traffic or silently observing people in conversations. Sometimes I often just watched passively other anonymous viewers interests as they covertly watched birds drinking from a puddle, people walking down the streets and the hub of activity at the local store; a form of watching the watchers. The resulting images reflect a silent conversation with a town on the other side of the world, as I captured through screenshots a narrative of small-town America, or so it seemed to me.

CONCLUSION

In his novel, '1984', George Orwell wrote of his fears of a society where everything was overseen and overheard. This futuristic totalitarian state would be facilitated by ever developing technologies of surveillance implemented by the government. Writing in 1999, on the verge of the 21st century, Kristine Anderson, conjures up another vision of the future: 'technology should shrink the dimensions of the panopticon to a size that could literally fit into a pocket so that every man and woman on the planet could afford one. Then the gazed at could truly meet the gazer eye to eye, and the power conferred by knowledge would become available to all'.[34] That is a world we now inhabit, are absorbed in and rely on. Whereas Orwell's future was one of government manipulation and control, Anderson's hints at a readdressing of that power. While this paper articulates some of the ethical and moral ambiguities in certain modes of surveillance that Orwell voiced, it does endeavor to offer new interpretations through artistic practice and a broader cultural consciousness.

As some artists seek to hold a mirror up to such state oversight I have become increasingly interested in the quiet observations of surveillance cameras, the inherent beauty of their images, what Benjamin would refer to as an 'optical unconsciousness'.[35] The cameras I access daily through my smartphone act as dispassionate onlookers. Through them I become a voyeur of global interconnectedness; a conceptual and topographical survey of real-time dynamic observations; ranging from something akin to a 21st century digital grand tour or, on occasion, invoking William Blake's 'mystic travels'.[36] This visual narrative is often underpinned by references to historical and contemporary photographic practices; an objective eye of scrutiny of the world that was once the sole domain of traditional photographers.

The work is the product, in many senses, of the tacit acceptance of observational technologies by societies. For example, CCTV cameras are utilized for many purposes; monitoring weather, traffic, environmental issues, security agendas, the result of which is a wide-ranging oversight of vast landscapes, Figure 5, to transient moments such as birds landing on a nest above a northern European town.

Figure 5. Mark Edwards: 'Granville Idaho, USA', 2020. CCTV image.

Not too far into the past one could only traverse the globe from a single fixed point by charting a mental journey through cartography, a form of geospatial imagination. The availability of surveillance technologies, through their integration into smart phones, has brought about a connectivity that brings societies and the environments into our immediate visual orbit. These images that constitute, 'I Was Never There: The Pan Optics of Surveillance', stand as a metaphor for our collective symbiosis through the paradigm of a technology that has for so long symbolized fear and subversion.

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RETHINKING THE SURFACE OF CLASSIC GENRE FILM IN THE ERA OF GENERATIVE ARTIFICIAL INTELLIGENCE

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INTRODUCTION

The rise of generative AI—spanning large language models, text-to-image, and image-to-video technologies—is bringing significant changes to the production environment of cinema. These emerging tools challenge conventional notions of authorship, intertextuality, and many other notions that persisted as central issues at the heart of filmmaking. As generative AI becomes increasingly integrated into film production, the very question of what constitutes a film may come into sharper focus.

The word 'surface' is strategically chosen as an enigmatic term in this paper. What is the surface of film? Is it where semiotics inscribes meaning, layering signs upon signs to create a textual system? Or is it where formal qualities like texture, lighting, and composition shape perception and materialize affect? In a poststructuralist or intertextual framework, it becomes an unstable site that participates in a textual economy. In this theoretical framework, 'text' is understood not merely as a linguistic construct but as a complex semiotic structure embedded in various modalities of signification, deriving semantic value from established cultural codes, discursive practices, etc. Therefore, the condition of text that this study tries to examine transcends linguistic considerations.

The concept of genre has long played a crucial role in the film industry, functioning as both a framework for production and a means of audience engagement. As a mediating mechanism, genre induces the intertextual relationships between producer and audience, critic and the mass.

In this context, respectively reminding previous genre theory in today's condition, this study critically explores how genre—as an intertextual and agential surface—mediates the evolving relationship between human creators, AI systems, and cinematic textuality. The question of what the surface, as an ever-changing threshold, is now and what it does to us ultimately expands into the question of what kind of relational network we are situated in with our arts.

Agents Constituting the Text of Cinema

Movies are a complex product of industry and culture. Conventionally, there is a fundamental divide in how people approach filmmaking. On one side, you will find people who view films primarily as commercial ventures and focus on maximizing profits. On the other hand, there are filmmakers who prioritize the artistry and meaning of their work and want to convey a specific message through their films. To the extent that filmmakers have some independence from financial pressures, they can have some creative freedom. Instead of seeing movies as simply a means to generate revenue, films should be seen as having broader cultural and social implications.

In this discursive landscape, “genre” has been an absorbing element/agent that brings together *intertextually*. Barry Langford outlines how genre functions for different groups,

For film-makers, organizing production around genres and cycles holds out the promise of attracting and retaining audiences in a reliable way, so reducing commercial risk. For audiences, genre categories provide basic product differentiation while the generic ‘contract’ of familiarity leavened by novelty seems to offer some guarantee that the price of admission will purchase another shot of an experience already enjoyed (one or many times) before. For scholars, genre provides a historically grounded method of establishing ‘family resemblances’ between films produced and released under widely differing circumstances, and of mediating the relationship between the mythologies of popular culture and social, political and economic contexts.[1]

Genres function as evolving systems of meaning, balancing commercial reliability with cultural relevance. As Warshow notes in his analysis of gangster films, the movie industry creates "fixed dramatic patterns that can be repeated indefinitely with a reasonable expectation of profit," where originality serves to enhance rather than fundamentally alter these patterns.[2] While each new film builds on established conventions for financial security, genres are not entirely static. Though they connect to audiences' experience of reality, they more immediately appeal to familiarity with the genre itself, creating a "field of reference" that evolves gradually over time.[3]

As Warshow argues, a genre’s significance “cannot be measured in terms of the place of the gangster himself or the importance of the problem of crime in American life” but rather in how it establishes recognizable conventions.[4] The audience's pleasure comes from "very definite expectations," where "originality... intensifies the expected experience without fundamentally altering it.”[5] Nevertheless, genres subtly adapt to shifting anxieties, balancing commercial formula with cultural evolution. This tension between familiarity and evolution is what keeps the genre culturally relevant, providing comfort and catharsis, and gangster films, for example, gradually reconfigure themselves through an ongoing dialog between fictional representations and real-life experiences.

Critics, scholars, and theorists, on the other hand, intervene by analyzing and exposing the ideological codes activated by screen theory in the 1970s. These interventions also reconstruct the meaning of texts within the framework of new interpretations. Institutional interventions, such as publishing and academia, act as filters for which texts are published, distributed, or valued. This determines which texts become dominant and which remain peripheral. Economic constraints or demands determine which ideological positions are profitable in a feedback loop.

Decoding the Process of Crystallization

The term “text” refers to a structure or system that organizes meaning in a cultural context, in the tradition of literary theory and poststructuralism. The concept of text may go beyond linguistic elements to include semantic structures that derive meaning from cultural codes, discourses, and sign systems. By an encyclopedic definition, “a text is a structure composed of elements of signification by which the greater or lesser unity of those elements makes itself manifest.”[6] Yet, in traditional literary and film theory, a text is never a self-contained or closed system; it exists within an evolving network of intertextual relations. The concept of intertextuality reveals that the meaning of a text transcends autonomous boundaries and that each work exists within a complex matrix of cultural and literary relationships. Rather than functioning as discrete units, texts are shaped by complex interactions across different cultural and literary domains.

Barry Keith Grant argues that the 1970s saw a resurgence of scholarly interest in traditional narrative cinema, especially genre cinema, as after all, there was a growing interest in how cinema creates meaning and conveys ideology. Grant notes that scholars have generally viewed mainstream and popular cinema critically while utilizing it as a tool for maintaining middle-class values or

conservative perspectives. As such, film genres have come to be studied primarily to expose and deconstruct the meanings and cultural myths behind them, and genres have been proper forms of academic analysis because it allowed them to examine different aspects of films, such as the economic and historical context in which it was made, the symbolic patterns and storytelling conventions used in the film, or how the filmmaker worked within and was influenced by the framework of the genre. He views genre as a discursive process that requires active semiotic decoding—how viewers interpret, recognize, and negotiate meaning within conventions. Altman bridged formalism and audience studies by emphasizing how genres are co-created by viewers and producers. Because Altman's theory treats genre as a dynamic process rather than a fixed category, it can be applied across different cultural and national film traditions much more effectively than older genre theories that were primarily based on Hollywood-centric models. One ethnographic analysis-the intertextual relationship between the film industry and audiences is explained through the process of genre-blending and transformation.

Negotiation

Cho et al.'s study, which expressed concern about the boom of the Korean film industry in the 2000s—especially the stagnation of meaning-making amid commercial overpraise, describes the process as "a text where conservatism and innovation coexist": Since audiences actively express their expectations and demands regarding popular films, a continuous negotiation of meaning takes place. The filmmaker becomes sensitive to changes in the audience's reactions, their way of life, and how values are reshaped in the texts. This dynamic creates a cycle in which new social meanings emerge, are adopted, and reflected. Through this ongoing negotiation process with disruption and resistance between different agents, popular film texts constantly evolve and transform.[7]

EMERGENCE OF INDIVIDUAL PRODUCERS AND THEIR CULTURAL MEANING GENERATOR INTERFACE WITH GENERATIVE AI

AI is revolutionizing the film and video production industry. While AI has been slowly becoming commercialized since the 1980s, 2023 represented a pivotal turning point when these technologies and their applications gained widespread public recognition and adoption.[8] AI technologies became deeply integrated across all phases of video and film production, spanning from early concept artwork and pre-planning visualization to the final stages of editing and post-production.[9] Compared to what we have observed on the dynamics of distinguishable agents constructing the cinema text, we would like to examine the changed situation in the age of generative AI.

Applications such as Runway, Stable Diffusion, OpenAI's DALL-E, and Sora use complex machine-learning architectures that translate textual or visual prompts into video output. However, the precise mechanisms by which these models interpret and operate on the conventions of cinematic genres remain underexplored. Studies that provide a systematic analysis of how these models encode, interpret, and reproduce cinematic structures are hard to find. To address these challenges, the following sections address arguments that are drawn from a literature review of recent research on image and video generation applications, regardless of discipline or industry, along with an empirical analysis of generative AI platforms.

Emergence of Individual Producer-Audience

AI tools and platforms such as DALL-E, Stable Diffusion, and Runway are allowing non-professional users to generate high-quality content without requiring expertise. This phenomenon implies how AI democratizes content creation, enabling consumers to become instant producers. Besides this, the following sections describe dominant shifts related to this production condition.

Image-to-Video Over Text-to-Video

Prompted artwork generation has become a standard working pattern for video production, especially in the creative and commercial sectors. Unlike text-to-video models, which struggle with consistency and temporal coherence, image-to-video models tend to be favored in many applications because they excel at controlling motion dynamics while maintaining image fidelity. Image-to-video models also require much less training data than large-scale text-to-video models, making them more efficient, adaptable, and easier to fine-tune for specific applications.

According to "Diffusion Model-Based Video Editing: A Survey," image-to-video models outperform text-to-video models in realistic video synthesis regarding motion quality, object continuity, and frame-to-frame consistency, leading to their preference.[10]

As the experiential analysis, we can see that when a user attempts to generate a video on the Runway web platform, they are directed to a UI environment where they are prompted to upload a key reference image as the basis for video generation, while the text prompt remains optional, as shown in Figure 1. The video generated from the default setting constructs the base image in three dimensions, presenting it through camera panning and zoom movements while also generating and displaying minimal movements of the depicted character, as seen in Figure 2.

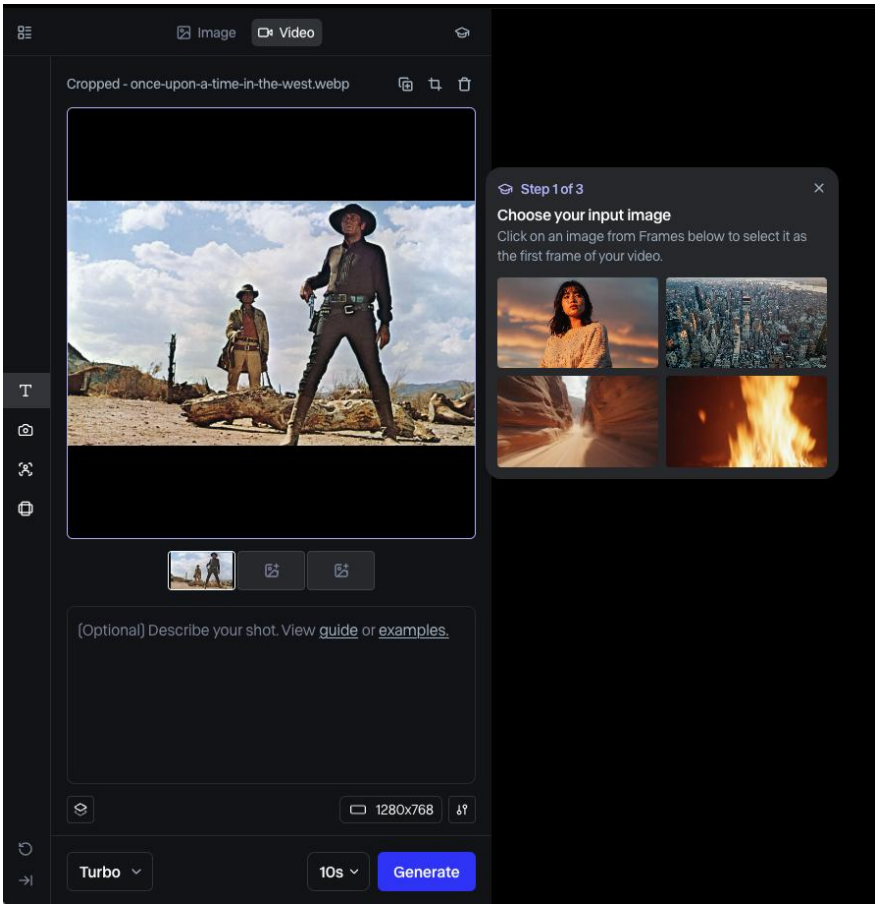

Figure 8. Initial Environment of Video Generation UI at Runway

Figure 9. Snapshot of a generated video without prompt

Figure 10. Snapshot of a generated video with prompt

Horror	High contrast, desaturated, unstable movement, dark color palette, horror aesthetic	cinematic photography at night of a woman with a fearful expression. she holds a small candle that gently illuminates her face. a terrifying figure can be seen behind her, barely visible and blending in with the dark black background. High contrast, desaturated, unstable movement, dark color palette, horror aesthetic	
Lo-Fi	Hand drawn panel, lo-fi 1980s japanese magazine art style, muted tones, pastel color palette, soft grain, nostalgic aesthetic, animated	a hand drawn panel from an old japanese anime about a woman reading a book in a spaceship. Lo-fi 1980s japanese magazine art style, muted tones, pastel color palette, soft grain, nostalgic aesthetic, animated	

Figure 11. Prompt guide for Frames, provided by Runway

The following experiment was conducted using a text prompt while keeping the same base image. The prompt read: "Two rugged cowboys in a high-stakes duel under the scorching desert sun. The man in the foreground, dressed in all black, grips his revolver with a cold stare, while his opponent, wearing a dusty brown coat, watches cautiously from a distance. The vast sky is filled with dramatic clouds, and the barren land stretches for miles. Sunlight casts long shadows across the cracked dirt, capturing the intensity of a classic Spaghetti Western standoff. Ultra-realistic, 35mm film texture, vintage sepia tones, inspired by Sergio Leone's cinematography." The most notable difference in the generated video was the dynamic movement of the characters, as seen in Figure 3.

In November 2024, Runway launched a new model called “Frames,” which promises enhancements that align with specific artistic and stylistic directions for image creation. As shown in Figure 4, the prompt guides provided for Frames emphasize visual and formal elements.[11]

The Algorithm

As discussed earlier, it is challenging to find the exact mechanisms by which generative AI models interpret and operate on the conventions of movie genres. In this vein, the following section synthesizes insights from recent literature to outline the general algorithmic processes underlying AI-driven genre adaptation. Latest contemporary methods, such as pattern recognition, latent space encoding, and feature extraction from large image datasets, can sufficiently describe how AI models learn, classify, and synthesize stylistic attributes that can be associated with a particular movie genre. The following describes the key algorithmic logic behind these processes.

AI models identify and learn stylistic rules by analyzing the relationships between images within a training dataset. By repeatedly training on visually similar images, AI systems extract patterns related to composition, lighting, color grading, and texture details, which can be associated with specific film styles. Deep learning architectures such as convolutional neural networks (CNNs), vision transformers (ViTs), generative adversarial neural networks (GANs), and diffusion models can process these hierarchical features to recognize and reproduce visual elements that can define a genre. For example, cyberpunk imagery often forms recognizable visual patterns with high-contrast neon lights, urban density, and a futuristic aesthetic, and these features are elements to be extracted.

Next, AI organizes all processed images into a latent space, a high-dimensional mathematical representation where visually similar images are grouped based on shared attributes.[12] Within this space, clusters of stylistically related images emerge, meaning that images featuring similar lighting,

color schemes, framing, or compositional elements are positioned closer together. This clustering may serve as an implicit genre boundary, even though AI does not categorize images in explicit cinematic terms.

Lastly, AI models likely reinforce stylistic consistency through iterative refinement and feedback mechanisms. In GAN-based architectures, for example, a generator creates images, while a discriminator evaluates them by comparing them against real dataset examples.[13] Over multiple iterations, the generator learns to create images that increasingly resemble real-world genre-specific visuals by minimizing perceptual differences.

Real-time Transformations Within Individuals

As users interact with the platform's systems, images are dynamically transformed in real-time, generating immediate feedback and allowing for interpretation and transformation. Before the eyes of the individual creator, the image continues to hybridize, transform, and mutate between different styles, genres, and symbolic frameworks.

As algorithmic processes are combined with subjective interpretation, the distinction between human and machine creativity is blurred, and the boundaries used to separate artistic conventions are blurred. Images and textual elements begin to lose their familiar character and original meaning through constant repetition and transformation and become unfamiliar and destabilizing through overuse.

CONCLUSION

The reconceptualization of genre in film studies necessitates a fundamental reexamination of how we engage with and construct the 'text.' While classic genre films of the pre-AI era exemplified an intertextual condition characterized by dynamic interactions between audience, film text, and capital-driven producers, contemporary developments in artificial intelligence herald a significant transformation of this tripartite relationship.

The rise of AI-driven production represents a paradigm shift in the meaning-making process. Trained on vast repositories of existing images, AI and machine learning models generate new visual content through pattern recognition rather than traditional discursive text structures. When we look at the surface of classic genres, we are now urged to extract meaning from the raw material as if it were a natural phenomenon. Individual creators as audiences are increasingly involved in content creation, focusing on visual formal qualities rather than traditional text decoding, marking a shift from interpretive to generative meaning-making.

The sociological implications of this shift may suggest a resurgence of textuality and intertextuality based on bodily context rather than globally shared sign systems. This development signals a potential departure from traditional screen theory paradigms. Michel Foucault's conceptualization of discourse as an ontological condition provides a valuable reminder. In *The Archaeology of Knowledge* (1969), he mainly discussed how discourse functions not simply as a linguistic system but as a fundamental structuring force that shapes individual perceptions and engagement with reality.[14] The changed condition of genre formation calls for a significant reconceptualization of text or the social process of meaning-making in cinema.

NOTES

[1] Barry Langford, *Film Genre: Hollywood and Beyond*. (Edinburgh: Edinburgh University Press, 2005), 1.
[2] Robert Warshow, "The Gangster as Tragic Hero" (1948), in *Gangster Film Reader*, ed. Alain Silver and James Ursini (New Jersey: Limelight Editions, 2007), 12.
[3] Warshow, *The Gangster as Tragic Hero*.
[4] Warshow, *The Gangster as Tragic Hero*, 13.
[5] Warshow, *The Gangster as Tragic Hero*, 12.
[6] Irena R. Makaryk, ed., Encyclopedia of Contemporary Literary Theory: Approaches, Scholars, Terms (Toronto: University of Toronto Press, 1993), 568, 639.
[7] Jong-hup Jo et al., The Intertextual Relationship Between Industry and Audience in Genre Hybridization (장르 혼합현상에 나타난 산업과 관객의 상호텍스트적 관계) (Seoul: Korean Film Council, 2004), 89.
[8] Matt O'Brien, "2023: The Year we Played with Artificial Intelligence—and Weren't Sure What to Do About It," *AP News*, December 14, 2023, accessed January 17, 2024, https://apnews.com/article/ai-2023-artificial-intelligence-chatgpt-dangers-565ff5b817b5db0d4e74829ae3d68611, quoted in Mihaela Mihailova, "In Focus Introduction: AI and the Moving Image," JCMS 64, no. 1 (Fall 2024): 170-174.
[9] Joshua Glick, "AI Isn't Hollywood's Villain—It's a Flawed Hero," *Wired*, January 13, 2023, accessed January 15, 2023, https://www.wired.com/story/artificial-intelligence-film/, quoted in Mihaela Mihailova, "In Focus Introduction: AI and the Moving Image," JCMS64, no. 1 (Fall 2024): 170-174.
[10] Wenhao Sun et al., "Diffusion Model-Based Video Editing: A Survey," arXiv preprint, June 26, 2024, https://arxiv.org/abs/2407.07111.
[11]"Frames Prompting Guide," Runway Help Center, accessed February 18, 2025, https://help.runwayml.com/hc/en-us/articles/35694045317139-Frames-Prompting-Guide.
[12] Gaurang Bansal et al., "Revolutionizing Visuals: The Role of Generative AI in Modern Image Generation," ACM Transactions on Multimedia Computing, Communications, and Applications 20, no. 11 (2024), 7.
[13] Raman Dhand et al., "Creating Realities," 3.
[14] Michel Foucault, The Archaeology of Knowledge, trans. A. M. Sheridan Smith (New York: Harper & Row, 1972), 57.

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EMPATHY IN ACTION: INTEGRATING COMMUNITY AND INNOVATION IN DESIGN EDUCATION

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INTRODUCTION

Design education is undergoing a transformation, driven by the need to address the complex shifts in society, culture, economy, and technology. These changes demand innovative approaches that emphasize immersive engagement and creative problem-solving.[1] As these transformations unfold, design education increasingly confronts "wicked problems"—multifaceted challenges that resist simple solutions due to their deep-rooted and interconnected nature.[2]

In our context, wicked problems often intersect with sociocultural dynamics, such as the high suicide rate prevalent in our community. These challenges highlight the importance of design thinking as a human-centered approach that prioritizes empathy and inclusivity. By reframing problems and engaging diverse perspectives, design thinking creates pathways for meaningful social impact.

This paper examines the evolving role of design education in preparing students to address societal challenges. Beyond technical skill-building, it fosters empathy and interdisciplinary engagement, equipping students with participatory, context-driven approaches to complex issues.

To frame this exploration, we first examine the theoretical and interdisciplinary evolution of design education and its role in addressing wicked problems. This foundation then informs our analysis of suicide as a wicked problem, illustrating how design thinking fosters collaborative problem-solving and drive meaningful social impact.

Empathetic Innovation in Design Education: Cultivating Human-Centered Problem-Solvers

Designers should recognize their capacity to drive change and critically evaluate the factors shaping personal and social life. At the core of this transformation is the ability to foster empathy-driven collaboration, a fundamental principle in design practice that reinforces the need for shared efforts in innovation and transformation.[3] This perspective positions design as a discipline that synthesizes art, intuition, theory, and social science, fostering innovation in engagement, participation, and the relationship between learning, knowledge-building, and experience.[4] Additionally, it calls for a comprehensive reorientation of designer values, attitudes, goals, and methods across all design sectors and society.[5]

Central to this evolution is the adoption of "new design thinking," as articulated by Arturo Escobar in *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds*.[6] Unlike conventional problem-solving methods, new design thinking prioritizes problem-finding and framing,

addressing design's critical, social, and political dimensions.[7] Escobar highlights the need for a fundamental reorientation of design values and practices, emphasizing social ethics, environmental responsibility, and human-centered approaches as catalysts for transformation.[8] These principles reposition design as a tool for social impact, advancing interdisciplinary collaboration and the creation of "alternative cultural visions" that inspire meaningful change.[9]

Paola Antonelli reinforces this perspective, emphasizing design's evolution from a discipline focused on isolated solutions to one that interacts with complex systems. She describes how design functions as both a critical lens and a dynamic instrument for forging cross-disciplinary connections. This expanded role fosters a deeper understanding of the relationships between human, cultural, and environmental factors.[10] Rather than merely reacting to immediate problems, design now has the potential to anticipate, influence, and shape long-term societal shifts.

As design education evolves, the integration of participatory methodologies, interdisciplinary thinking, and contextual sensitivity becomes essential for addressing wicked problems. These transformations underscore the growing importance of inclusive, participatory strategies that embrace diverse perspectives, positioning design education as a conduit for social innovation.[11]

Among these challenges, the wicked problem of suicide demands particular attention. The sociocultural and systemic factors contributing to high suicide rates highlight the urgent need for deeper examination and cross-disciplinary exploration. The following section unpacks this pressing issue, exploring the structural barriers that exacerbate mental health challenges and positioning suicide within the context of wicked problems. This sets the stage for a discussion on how design education, grounded in empathy-driven methodologies, can foster human-centered problem-solving and drive meaningful social impact.

UNDERSTANDING SUICIDE AS A WICKED PROBLEM

Suicide rates have remained alarmingly high across the United States for the past three decades, with certain regions experiencing disproportionately severe impacts due to geographic, economic, and social factors. Rural states, in particular, face heightened risks stemming from limited behavioral health services and pervasive social isolation. Among these high-risk areas, Montana consistently ranks among the top five states for suicide rates across all age groups, as reported by the Montana Department of Health and Human Services.[12] This crisis reflects systemic challenges where spatial isolation, stigma, and inadequate resources create significant barriers to mental health support, making Montana a critical case study for understanding the intersection of geography and public health.

Higher suicide rates are frequently linked to smaller populations, geographic isolation, and a lack of mental health infrastructure—challenges exacerbated by the social disconnection caused by the COVID-19 pandemic.[13] While Montana's rural landscape and sociocultural dynamics make it a compelling focal point, these challenges are not unique. Across the U.S. and globally, communities with similar structural barriers face comparable struggles.[14]

The difficulties in accessing mental health care in Montana underscore the need for alternative solutions that transcend physical constraints. By leveraging digital tools and community-driven initiatives, there is potential to create more inclusive, accessible, and culturally responsive approaches that reach individuals in need, particularly in underserved and geographically isolated regions. Rethinking how students and communities engage with mental health resources opens new avenues for fostering connection, awareness, and support.

Addressing suicide prevention requires approaches that move beyond traditional intervention methods, engaging communities in meaningful ways to reduce stigma, increase accessibility, and foster emotional resilience. Grounded in the belief that transformative design education can contribute to these efforts, we have developed a multi-layered program that applies design thinking

methodologies to generate creative solutions. By examining Montana as a microcosm of a larger global issue, this discussion examines how design education can drive empathy-building, expand access, and inspire innovative approaches to mental health interventions.

DESIGN EDUCATION IN ACTION: FROM CLASSROOM TO COMMUNITY IMPACT

Design education extends beyond the classroom, driving real-world change through creative problem-solving, collaboration, and community engagement. In the context of mental health awareness and suicide prevention, design serves as a catalyst for shifting perspectives, sparking dialogue, and dismantling stigma.

To translate these principles into action, we implement a three-fold approach integrating expert collaboration, empathy-driven design thinking, and community engagement. This structure ensures students not only understand suicide as a wicked problem but also contribute to creative interventions that foster awareness, connection, and support.

By bridging learning with action, this approach enables students to apply design in ways that are socially impactful, deeply empathetic, and responsive to community needs.

Designing with Awareness: Collaborating with Mental Health Experts

A critical aspect of integrating mental health awareness into design education is teaching students to engage with sensitive topics responsibly and thoughtfully. Suicide prevention extends beyond awareness—it requires structured communication that prioritizes safe language, inclusivity, and empathy. To prepare students, we collaborate with mental health experts from the University's Counseling and Psychological Services and the Montana Department of Public Health and Human Services.

Bringing mental health professionals into the classroom provides students with insight into crisis intervention, responsible communication, and the impact of language on mental well-being. Experts introduce suicide prevention frameworks, helping students understand the psychological, cultural, and systemic factors shaping mental health crises. They also guide students in using safe language, adopting trauma-informed design strategies, and critically analyzing real-world mental health campaigns to ensure messaging is supportive and effective. Through discussions and case studies, students assess existing initiatives, identifying areas for improvement while considering the broader impact of their design choices.

A key challenge in integrating mental health awareness into design education is ensuring discussions remain constructive and do not reinforce stigma. The presence of trained experts fosters a structured, solution-oriented learning environment. To create a safe yet open space, we implement:

- **Guided Discussions:** Experts help students navigate complex emotions while maintaining a respectful and inclusive space.
- **Reflective Exercises:** Students examine their own perspectives on mental health and how biases may shape their design decisions.
- **Crisis Resource Awareness:** Before engaging with suicide-related topics, students receive mental health resources and guidance on seeking support.

By applying these strategies, the classroom becomes both academically rigorous and emotionally supportive, empowering students to engage with difficult topics while considering their real-world impact.

Mental health professionals and designers bring complementary expertise—experts offer insights into crisis intervention and behavioral psychology, while designers focus on storytelling, visual engagement, and accessibility. This collaboration helps students reimagine mental health awareness campaigns, enhancing accessibility and engagement while developing inclusive messaging strategies

for diverse communities. They also assess how design choices can either support or undermine public health initiatives.

Beyond classroom visits, our program fosters long-term partnerships with mental health professionals, advocacy groups, and public health initiatives. Embedding mental health literacy into design education ensures that students produce work that is not only visually and conceptually strong but also socially responsible. By integrating expert insights into the curriculum, we move beyond aesthetics, equipping students to use design as a tool for advocacy, intervention, and social change. This prepares them to be conscientious designers who contribute meaningfully to public discourse on mental health.

Empathy in Design: From Self-Reflection to Collective Impact

While expert engagement equips students with knowledge of mental health discourse, inclusive and empathy-driven design thinking challenges them to apply these insights in a collaborative setting. Through self-reflection and group-based creative exploration, students move from passive understanding to active engagement, using design as a tool for connection, communication, and advocacy. This process not only strengthens individual awareness but also fosters collective responsibility, as students work together to develop integrated and harmonized visual narratives.

At the core of this project is group work, where each team of four to five students collaborates to create a unified installation. While each student develops their own design contribution, the challenge lies in integrating diverse perspectives, visual languages, and techniques into a seamless and cohesive whole. This requires inclusive thinking and empathy-driven design approaches, as students must navigate differences in creative expression, reconcile aesthetic and conceptual choices, and collectively construct a shared spatial experience. In this way, they are not only integrating digital and physical elements but also learning to integrate and adapt to one another's work, ensuring that the final installation reflects a harmonized yet multi-voiced narrative.

Empathy is not just an emotional response—it is a practical skill that can be cultivated through intentional design practices. Inclusive and empathy-driven design thinking provides a structured framework for prioritizing human experience, storytelling, and problem-framing. This approach challenges students to consider how their work interacts with others, both in content and form, ensuring that each contribution strengthens the collective message.

Empathy Mapping and Storytelling Assessment

Before constructing visual narratives, students engage in empathy mapping exercises to explore how different audiences might emotionally engage with their work. This step encourages them to recognize their own biases and assumptions while fostering a deeper understanding of mental health struggles from multiple perspectives.

- **Empathy Mapping:** Through in-class discussions and peer critiques, students assess how different audiences might interpret and emotionally respond to their work. By exchanging perspectives, they refine their narratives to be more inclusive, accessible, and considerate of diverse experiences.
- **Storytelling with Sensitivity:** Through guided discussions and peer critique, students assess how language, tone, and imagery impact viewers, ensuring their work remains responsible, supportive, and free of harmful stigmas.

By engaging in self-reflection before creation, students build a deeper connection to the issues they aim to address. This method transforms design from an abstract skillset into a human-centered tool for connection and advocacy.

Integrating Digital and Physical Work

Figure 1. Students constructing a 3D installation as a foundation for projection mapping.

By combining traditional (Figure 1) and digital design methods (e.g., drawing, motion graphics, installations, projection mapping), students create immersive, accessible experiences that push the boundaries of visual storytelling. This process challenges them to expand their design techniques, encouraging experimentation with diverse media and broadening their technical and conceptual skills. Students must navigate the interplay between physical and digital elements, balancing craftsmanship with emerging technologies to enhance audience engagement. They collaborate within their teams to ensure that individual contributions are seamlessly integrated into the collective installation, reinforcing shared narratives and spatial storytelling (Figure 2).

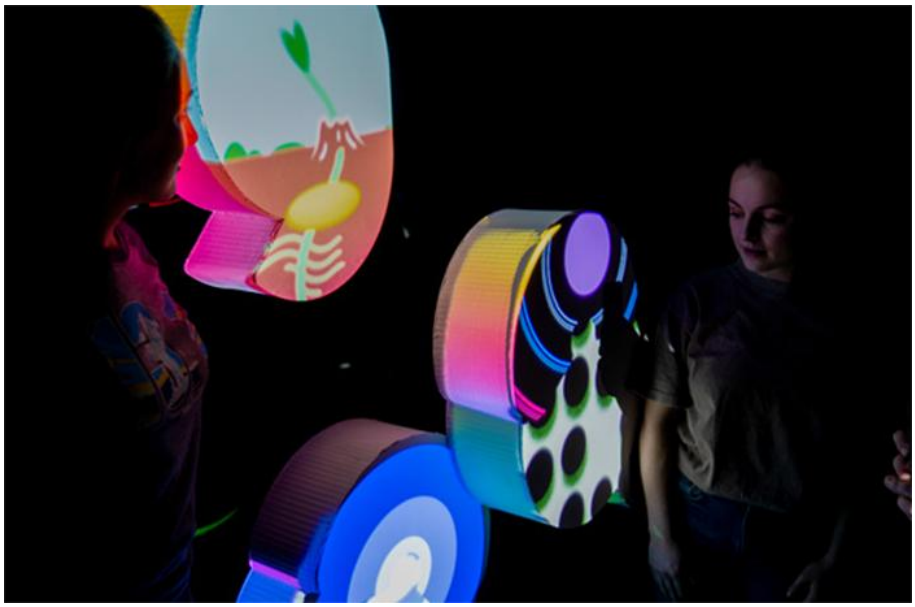

Figure 2. Installation view of a student work integrating traditional and digital design. Video projection, animation, mixed media, surround sound.

Bridging Empathy and Constructing Narratives

Once students have refined their understanding of empathy and impactful storytelling, they shift to constructing narratives that reflect diverse perspectives. Through problem-framing techniques, students identify the core message they aim to communicate and determine the most effective visual and interactive strategies to convey it.

- **Multi-Sensory Storytelling:** Students experiment with motion, interaction, and spatial design to enhance emotional resonance and deepen audience engagement.
- **Harmonized Group Installation:** Students work collectively to refine their designs, ensuring that each contribution complements the overall vision.

This collaborative process extends beyond technical execution—it demands negotiation, active listening, and openness to multiple perspectives. Each student must balance their creative expression with the needs of the group, merging their contributions into a unified and meaningful visual experience.

Empathy as a Pathway to Social

Ultimately, empathy-driven design thinking empowers students to become not only designers but also social advocates. By engaging with complex narratives, developing self-awareness, and working collaboratively, they develop the skills necessary to address real-world issues with both sensitivity and impact.

This group-based approach ensures that students move beyond individual design exercises—they become catalysts for dialogue, engagement, and positive change in mental health advocacy. Their work extends beyond the classroom, fostering new perspectives, reducing stigma, and demonstrating the power of design in shaping public understanding of mental health.

As we move forward, the next section explores how this empathetic and inclusive approach expands into community engagement efforts, reinforcing the role of diverse perspectives in shaping meaningful and accessible design solutions.

Community Engagement: Activating Empathy Through Public Dialogue

Community engagement is an integral extension of our educational vision, ensuring that the impact of design thinking moves beyond the classroom and into public discourse. Through immersive student-led public installations, students actively participate in breaking down stigma, raising awareness, and making mental health resources more visible and accessible. By facilitating dialogue through design, we seek to combat social isolation and challenge prevailing misconceptions surrounding mental health and suicide.

At the core of this initiative is the application of design thinking to address Montana’s high suicide rate and broader mental health challenges. These installations serve as interactive spaces for conversation, reflection, and connection, where students and the community engage in meaningful discussions. Unlike static exhibitions, they foster direct interaction, shaping how audiences interpret and internalize the narratives embedded in the designs.

Students as Advocates for Change

During community Art-Walk Week, students positioned their installations in high-traffic public spaces, guiding visitors through their work and sharing insights into their creative process. These conversations helped audiences connect to the themes on a personal level, reinforcing that mental health is a shared human experience rather than an isolated struggle.

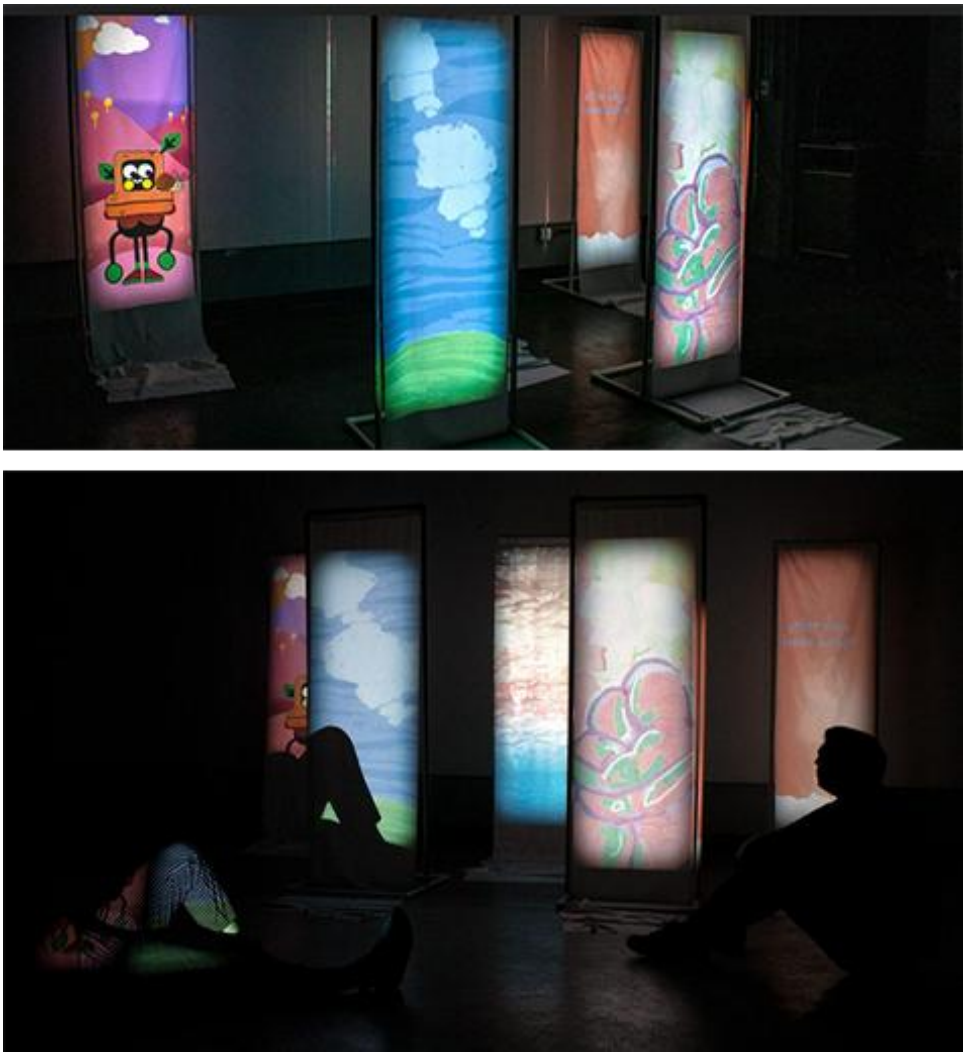

Figure 3. Installation view of a student work (top) and with audience engagement (bottom). Video projection, animation, mixed media, surround sound.

Beyond storytelling, students communicated mental health resources, crisis helplines, and suicide prevention initiatives into their work. This ensures that discussions are not only reflective but also action-driven, providing tangible support and solutions.

Audience participation further transformed these installations into interactive experiences. Visitors were encouraged to share reflections, write messages of support, or engage directly with the work, creating a reciprocal exchange of empathy. This active engagement helped break social isolation and foster a shared sense of responsibility in addressing mental health challenges (Figure 3).

Through these interactions, students gained firsthand experience in advocacy, refining their communication strategies to reach diverse audiences while ensuring their messaging remained inclusive, accessible, and trauma-informed. At the same time, the community benefited from a creative and approachable introduction to mental health awareness. Hearing students articulate their design choices and motivations personalized the conversation, breaking down stigma and encouraging openness.

This shift—from clinical discourse to human-centered storytelling—made mental health education more engaging, relatable, and impactful. Students emerged from this experience not just as designers but as advocates for social change, learning to balance aesthetics with emotional depth to create work that is both visually compelling and socially responsible.

CONCLUSION

Student-led public installations highlight the transformative role of design in mental health advocacy. These experiences equip students to merge creativity with advocacy, demonstrating how design bridges awareness, empathy, and action.

By integrating mental health resources, suicide prevention awareness, and public dialogue into their work, students move beyond traditional education—applying design as a tool for real-world impact. Through empathy-driven storytelling, they become active agents of change, using their skills to foster connection and drive meaningful conversations.

Beyond Suicide Prevention: Community Engagement: Activating Empathy Through Public Dialogue

While this paper primarily addresses suicide prevention, our broader objective is to harness design methodologies to understand, address, and resolve a wide range of complex social challenges. Through design pedagogy, we have established a foundation for both individual and social innovation, extending beyond design students to engage diverse communities. Our vision is to facilitate meaningful connections between educational institutions, regions, and communities, integrating design practices seamlessly into everyday life. As educators, we are committed to bridging emotional and systemic gaps—between individuals, students and education, and classrooms and society—ensuring that design remains a tool for relevance and active community engagement.

Recognizing that our role extends beyond designing for people to designing with communities, we acknowledge the need for inclusive, participatory approaches. Complex issues like suicide are not only difficult to solve but also sensitive to discuss. To navigate this challenge, collaboration and interdisciplinary innovation are essential for generating impactful solutions. By bringing together educators, mental health professionals, and diverse experts, we cultivate an ecosystem of ideas that ensures our work is both culturally responsive and actionable.

Looking ahead, our vision pivots toward experience design, a methodology that enhances interactions with complex systems by making them more accessible, intuitive, and emotionally meaningful.[15] Within this framework, we plan to adopt psychological theory-based approaches, specifically integrating the IMV Model—a framework that bridges psychopathology, suicide research, and health psychology to map pathways to suicidal ideation and self-harm.[16] By segmenting the issue of suicide into clear, research-driven components, this model will guide the development of design thinking-based interventions that are both innovative and effective.

In conclusion, our work remains dedicated to leveraging design as a force for connection, awareness, and social change. This initiative has the potential to transform classrooms into incubators for real-world impact, fostering empathy while addressing critical societal issues. Moving forward, we will continue to explore new methodologies that amplify the power of design thinking and creative engagement, ensuring that design education remains a catalyst for systemic change and collective well-being.

NOTES

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METACINEMATIC VULNERABILITY IN NOTES ON BLINDNESS

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INTRODUCTION

Notes on Blindness (2016) is a British documentary directed by Peter Middleton and James Spinney, depicting theologian John Hull's life after his acquired blindness.[1] Blending reenactments with lip-synced recordings of Hull's meditations, the film self-reflexively explores vulnerability and perception. Hull's audio archive was also published as *Touching the Rock*, with a foreword by British neurologist Oliver Sacks, who described Hull's transcendental insight as "deep blindness".[2] This article examines how the film embodies human vulnerability through the paradox of perception in blindness.

MODAL NARRATION

While explicitly adopting a diaristic form, the film's implicit narrativization presents Hull as the authorial character, enabling seamless transitions between omniscient and subjective points of view. Hull's voice provides both story information and an inward perspective, transforming the reenacted filmic space into an extension of his internal surface. The fusion of representation and reflection through Hull's first-person narration grants blindness an intimate visibility. Hull's modal narration articulates his morality of grace, internal resilience, and perceptual transference, affirming the truthfulness of documentary characterization.

Authorial Character

As the figure of the author, Hull recounts encountering sudden and inexplicable blindness in his late 40s. The directors implement the motif of rebirth in the story of Hull's blindness, extending Pointon's four themes of disability documentary, which identify transformation, tragedy, normalization, and spectacle.[3] Defying a tragic self-understanding, Hull comes to see himself as a recipient of "a dark, paradoxical gift", discovering divine grace in blindness, which offers him "a way of life, a purification, an economy".[4] As a theologian, Hull's Protestant worldview challenges secular ethics when he experiences spiritual self-renewal through his grateful acceptance of irrevocable blindness. Observing the paradox between Hull's physical deterioration and his spiritual ascent, the film presents a distinction between moral understanding and moral formation, the latter of which, according to Wolterstorff, imparts not knowledge but moral discernment regarding just actions.[5] In other words, the documentary characterization of Hull involves an ethical dilemma, not in instructing how a blind person should react to his disability, but in whether one can form a compassionate response to how Hull rewrites his life.

To ethically represent human complexity, documentary characterization should involve "intended allegiances and antipathies".[6] Compassion for Hull's spiritual surrender lies between our moral need for self-transcendence and our natural aversion to suffering as misfortune or evil. It is in the Christian God of omnibenevolence and providence that Hull finds reason and meaning in his blindness. As Nåls argues that a truly empathetic documentary must address both the "why" of suffering and the "why" of character, theologian John Hull's gratitude for his blindness veridically recreates a way of being guided by a divine calling.[7] By conveying the restorative faculty of the human mind, the film also raises questions about a certain blindness inherent in sighted viewers.

Reenacted Space as Internal Surface

Primarily identified as an external perspective from which Hull's blindness is objectively recounted, the filmic space in the reenactment also functions as a reflective surface, where Hull's recollective and inquisitive voice-over transforms the descriptive space into an imaginative plane of inner subjectivity. Hull's first Christmas with blindness, during which he can only hear the joy of his young children, becomes a harrowing experience of panic. This is symbolized by a scene in which a sudden water surge in a grocery store attacks his family. Then, it is followed by a scene where Hull wanders through a deserted forest in a foggy windstorm, accompanied by the narration of his wife, Marilyn, who calmly confesses her fear of helplessly losing her husband to complete darkness. The spatial realism in these imaginative scenes does not literalize physical abandonment but contextualizes Hull's desolation and forsakenness.

Due to cinema's automatic power to reproduce reality, as Hugo Münsterberg observed, the aesthetic and the psychological intertwine in cinema because it obeys "the laws of the mind", restructuring attention, memory, and imagination.[8] Film perception infers Hull's otherworldly isolation and sensory depletion, which are physically inaccessible to the audience. Consequently, Brylla criticizes the secondhand fictionalization of Hull's blindness and regards the film's relatable religiosity as deploying a mythical "supercrip narrative".[9] However, as *The Act of Killing* (2012) demonstrates, reenactment in documentary is not merely a narrative fabrication, for it intends "performance-based reflexivity", differentiating diegesis and non-diegesis to reinforce perceptual and moral shifts.[10] In the reenacted scene where Hull develops a new volumetric perception of rain through hearing alone, he finds cognition itself beautiful. This is not an irrational hallucination but a perceptual augmentation, as human cognition, involving selection and reconfiguration, is habitual and rarely self-recognized as beauty. As supported by Carroll's defense of the Münsterbergian view that film perception is analogous to human cognition, our sympathy with Hull in the reenactment arises from engaging reasoned thought rather than unconscious fantasy.[11]

Perceptual Voice

Wartenberg also observes in *The Act of Killing* how the reenactment in which the perpetrators stage and confront their past actions reveals an "empathy deficit" and can serve as the ground for ethical inversion.[12] Likewise, the perceptual deficit that hinders sighted viewers from understanding Hull's world of blindness inverts the ethics of ocularcentrism. *Notes on Blindness* integrates obscurative visuals with characterization developed from voice recordings. As Sesonske points out, first-person narration with past recollection and present-tense commentary creates immediacy by naturalizing both audience time and narration time, merging them into "the greater objectivity of a distanced view".[13]

As a new, introspective perception emerges from Hull's degenerating vision, his mixed-tense narration mirrors both the fading memories of the seen world and the unforeseen revelations that follow in succession. Once Hull recognizes blindness as a necessary evacuation of consciousness for the redemptive recreation of his life, the film's concluding revelation unfolds in a church. Upon

hearing the pipe organ, Hull's heightened auditory sense feels the whole church throbbing with vibration. Enveloped in the sensorial intimacy of hymnal sound, Hull then confesses to being visited by the supernatural presence of God, who places a dark cloak over him and remains by his side. As Michel Chion suggests regarding the ontological priority of the confessional voice over the image in cinema, Hull's voice, despite its illusionary fusion with an actor's body, still exerts a "centripetal" pull toward Hull's original body.[14] Hull's experience of God through the physicality of his body shows the continuity and rationality of perception in blindness, mystifying neither the seen nor the unseen world.

In *The Arbor* (2010), where actors similarly lip-sync to pre-existing interviews, the performative and the real remain in a state of virtuality, emphasizing theatrical spectatorship.[15] Comparatively, Hull's synesthetic mode of perception suggests a greater objectivity in understanding our shared world. It becomes an ethical and sensory inversion where the viewer must engage with blindness not as a past affliction but as an active mode of perception in the present.

SPECTATORIAL INVERSION

When Hull receives divine consolation at the church, he tries to comfort God by expressing peace and contentment. The moment Hull reassures God is also the moment Hull sees blindness as a gift. As Hull realizes receiving blindness as a gift does not come from asking for blindness as a gift, his question shifts from why he became blind to what to do with blindness. Like an unrequested gift, Hull's identity as a blind person is something received rather than achieved through personal effort. For Hull, confession is not the psychoanalytic means of confrontation and subjective construction but a mode of spiritual attunement that embraces vulnerability and relational presence. Hull's perceptual and existential vulnerability creates an inverted spectatorial position where the viewer must also be aware of their perceptual vulnerability to the unseen order of the world, seeking a point of stability beyond the visible realm.

Epistemic Transformation

Given the painful despair and the sensory lack, it may seem psychologically proper to evaluate Hull's encounter with God as delusory. Since Hull was not born blind, his sighted memories may have contributed to his divine vision. One may feel sympathy for Hull's suffering yet struggle with his worldview, which expresses gratitude toward a God who allows pain and suffering. It is difficult not only to find a reason for suffering but also to reject the existence of God merely because we cannot find such a reason. It is an epistemic error to regard Hull's account as mythical or nonfactual because the present inability to find a humanly comprehensible explanation for suffering does not make the existence of God improbable.

Hull visits his elderly parents and reintroduces himself as a blind person, only to realize that he has lost memories of his childhood home before his blindness. The sense of visual hunger in blindness leaves Hull in a perpetual fall into an abyss. Hull is saddened by the self-conscious act of smiling as a blind person, unable to receive a replying smile. The space of loss is both imaginary and real when, for the first time touching his aging father, Hull grasps his father's fragility and envisions his father's pain of having a blind son. As a blind father, Hull cherishes the echoing farewell of his youngest son at the school drop-off. In all these accounts, an epistemic shift occurs. Like sensing rain, Hull internally experiences himself as being known to the world. Despite Hull's physical alterity, which remains beyond our perceptual access, we still identify with his mind.

As Kramer notes, the central mode of communication in the first-person documentary is a sense of relational bond and attachment, simultaneously offering implicit relational knowledge of the "paralinguistic and non-verbal" kind akin to infantile communication, as well as explicit relational

knowledge of the "declarative, symbolic, and imaginary" kind, which stems from conscious experience.[16] For Hull, there is no visible change in the external world, only a substantiation of the interior landscape. There is no dissolution of subjectivity in Hull's verbal representation of his conscious interiority, but the development of dependence on a transcendent attachment figure. As Hull's interpersonal relationship includes God, his divine attachment reveals the familiar estrangement inherent in our longing for an attachment figure.

Reflexive Identification

Hull's dependence on God issues a unique challenge for theories of identification in film. While Gaut's aspectual identification model suggests audiences identify with characters in selective and partial ways, Allen critiques identification as unnecessary for emotional engagement.[17] Hull's faith-driven response to suffering invites some audiences into deep identification while creating distance for others. It explores the limits of identification in film spectatorship and suggests identification as a process not of absorption but of self-inquiry.

Gaut's four aspectual identifications are 'perceptual' through camera perspective, 'epistemic' through narrative information, 'motivational' through character's desire, and 'affective' through imaginative feeling.[18]While viewers who share Hull's worldview may identify more affectively and motivationally, others may struggle with such identification yet still grasp the implications of his condition epistemically and engage with his transformation without embracing it. Allen counters that identification, as a means of imagining oneself as a film character, is unclear and unnecessary. Instead, film engagement is driven by analytic elements such as narrative perspective, emotional prompts, and character traits.[19] From this view, audiences who do not identify with Hull's faith may still be moved by his vulnerability, perseverance, and philosophical reflections.

While Gaut acknowledges film's formal complexity in effecting identification, Allen emphasizes its direct existential correlation with reality. Both recognize the ethical implications of heuristic involvement with film characters, Gaut preferring empathy, 'feeling-with', and Allen preferring sympathy, 'feeling-for'.[20] To bridge identificatory immersion and existential attributes, we may anchor in the idea of the character as a mirror, engaging in 'feeling-through'. Instead of an aesthetic object of identification or an external figure of skepticism, a character may be a reflective surface for introspection on human vulnerability. As Rothman argues, the camera's power to reveal transfigures a film character into a malleable subject for interpretation.[21] The pleasant unknowability of a character's full experience satisfies our self-recognition of limits, making vulnerability a referential framework.

Meta-Vulnerability

The spectatorial finitude in identifying with Hull's internal knowledge of himself and God, where introspection transforms perception, aligns with the style of "paralyzed pathos", through which the extremities of life are presented in many of Werner Herzog's films.[22] A taxonomy of vulnerability explains how the affective styles of imperilment and helplessness in cinema relate to their spectatorial consequences, as vulnerability is "inherent" as the intrinsic human condition of dependence and "situational" as preventable and reparable by social and relational mediations.[23] Both inherent and situational vulnerability may be either "dispositional or occurrent", manifesting conditionally or presently.[24]

Our perceptual limitation in identifying with Hull's interiority may be an aesthetic condition that predisposes viewers to his existential vulnerability or a lived experience of epistemic finitude encountering divine intervention in his spiritual recovery. It is a state of meta-vulnerability, where vulnerability as a filmic expression serves as an evaluative framework for the "productive or counterproductive" appraisal of human vulnerability, distinguishing between detached pity and

rightful compassion, between the illusion of self-sufficiency and the reality of embedded dependency.[25] Vulnerability, rather than merely an involuntary exposure to indeterminacy, has been understood as an "anticipation of potential determinations" in theistic contexts.[26] Contrarily, in military contexts, invulnerability has been upheld as a virtue to conceal the shame of surrender.[27] Vulnerability is not merely an endangered state but an openness to humanity's inherent impossibility of perfection, evoking a moral desire for a just state of being.

While sociopolitical abstraction, grounded in contemporary measures of oppression, fails to account for universal weakness beyond difference, Hull's story suggests that a life of vulnerability is redeemable not through self-imposed striving for perfection but through self-sacrificial gratitude. The idea that our inherent imperfection is the defining worth that equalizes all directly relates to justice, which, as Wolterstorff argues, does not require "some external standard bestowing rights" on individuals, as "ideals and principles often negate real human experiences".[28] Vulnerability simply magnifies our inherent worth as human beings.

Against the Kantian view of art as mere contemplative production, Wolterstorff argues that art enacts justice when all are respected through aesthetic decency, what he terms "genuine flourishing", a state that transcends mere material satisfaction and exists only when oppression ceases.[29] Similarly, Scruton regards art as a moral necessity for society, defining artistic taste through virtue as "the sum of those preferences that would emerge in a well-ordered soul".[30] Frustrated with the aesthetic delinquency of modern art, Wolterstorff and Scruton stress the consolatory role of beauty for social purposes, criticizing aesthetic ideologies that dismiss "the need to find solace in the contemplation of beauty" and reject the traditional notion of aesthetic fruition, which holds that "the search for objectivity is for valid and heightened forms of human experience".[31] As in Hull's story, vulnerability, as a means to justly communicate the beauty of human weakness, may function as an aesthetic criterion when it embodies aesthetic excellence in consoling us about the objectivity of human worth.

PARADOX OF PERCEPTION

Schweiker argues that vulnerability generates a mode of understanding mortality, dependence, and transcendence, driving moral reasoning and moral motivation.[32] He differentiates between the philosophical framing of vulnerability as the pattern of life and the theological framing of vulnerability as divine sovereignty, the latter of which he calls "a unity of the virtues", an ethical concept unknown to Greek philosophy.[33] While Aristotle's virtue ethics promotes human flourishing, 'eudaimonia', by emphasizing good habits and their merit in overcoming a vulnerable self, it lacks an understanding of an entity "to which moral agents are fundamentally vulnerable".[34] According to Marion, who defines the objectivity of perception as "the gifted", this naturally vulnerable responsiveness to a moral order beyond the self arises from "a givenness of paradoxes", a constitutive condition satisfying the criteria for the fullness of experience through the capacity to receive.[35] This humbling awareness of the givenness of the world also manifests a political effect of gratitude, revealing both human fallibility and radical selflessness as "otherness implicated in one's inmost subjectivity".[36] Vulnerability is a receptive state in which the capacity for good and evil depends on one's moral understanding of givenness, while behavioral autonomy and ontological dependence remain irreducible to each other.

The paradox of perception, where perception is both an autonomous act and an act of dependence, reveals how one regards others through the way one sees oneself as an other. Hull first receives the darkness of blindness as pure absence and then as inner purification. His shift in perception moves us beyond the self-reinstating ego of nihilism toward a selfless attunement to transcendental justice, as he reconstitutes himself as an unknown passivity. In theistic terms, this paradox is understood as divine grace, where determinate potentiality resides in vulnerability as "the necessary and sufficient

condition to transform knowledge into beliefs that motivate and empower right action".[37] In Hull's self-representation, the paradox between confessional immediacy and expressive self-distancing neither relativizes the act of self-inscription nor idolizes the impossibility of total self-comprehension. Instead, it preserves the absolute temporality of self-perception, the "then and there" of autobiography, by portraying the vulnerability of the self as spanning from centripetal inclination to centrifugal elevation.[38]

CONCLUSION

Hull's centrifugal self-reflection challenges the existential blindness inherent in centripetal vulnerability. In his redemptive self-understanding, we witness the paradoxical renewal of justly recognizing oneself as vulnerable, not because of blindness, but despite it. Though using different terminology, Derrida invokes the givenness of visibility when he describes the representation of blindness as "sacrificial blindness", a figurative substitute for the impossibility of visualizing non-vision.[39] In Hull's self-sacrificial vulnerability through blindness, we perceive a potential vision of grace, not because of sight, but despite it.

NOTES

[1] *Notes on Blindness*, directed by Peter Middleton and James Spinney (London: Curzon Artificial Eye, 2016).
[2] John M. Hull, *Touching the Rock: An Experience of Blindness* (New York: Pantheon Books, 1990), 3.
[3] Ann Pointon, "Disability and Documentary," in *Framed: Interrogating Disability in the Media*, ed. Ann Pointon and Chris Davies (London: British Film Institute, 1997), 86.
[4] John M. Hull, *Touching the Rock: An Experience of Blindness* (New York: Pantheon Books, 1990), 205.
[5] Nicholas Wolterstorff, "How Screen Stories Can Contribute to the Formation of Just Persons," in *Screen Stories and Moral Understanding* (Oxford: Oxford University Press, 2021).
[6] Carl Plantinga, "Characterization and Character Engagement in the Documentary," in *Cognitive Theory and Documentary*, edited by C. Brylla and M. Kramer (Cambridge: Cambridge University Press, 2020), 127.
[7] Jan Nåls, "The Difficulty of Eliciting Empathy in Documentary," in *Cognitive Theory and Documentary*, edited by C. Brylla and M. Kramer (Cambridge: Cambridge University Press, 2020), 147.
[8] Hugo Münsterberg, *The Photoplay: A Psychological Study and Other Writings*, edited by Allan Langdale (New York: Routledge, 2002), 91.
[9] Catalin Brylla, "Spectatorship and Alternative Portrayals of Blindness," in Documentary and Disability, edited by Catalin Brylla and Helen Hughes (London: Palgrave Macmillan, 2017), 62.
[10] Daniel Yacavone, "Recursive Reflections: Types, Modes, and Forms of Cinematic Reflexivity," in *Metacinema: The Form and Content of Filmic Reference and Reflexivity*, edited by David LaRocca (New York: Oxford University Press, 2021), 138.
[11] Noël Carroll, "Film/Mind Analogies: The Case of Hugo Munsterberg," *The Journal of Aesthetics and Art Criticism* 46, no. 4 (July 1988): 496-497.
[12] Thomas E. Wartenberg, "The Act of Killing: Empathy, Morality, and Re-Enactment," in *Metacinema: The Form and Content of Filmic Reference and Reflexivity*, edited by David LaRocca (New York: Oxford University Press, 2021), 305.
[13] Alexander Sesonske, "Time and Tense in Cinema," *The Journal of Aesthetics and Art Criticism* 38, no. 4 (Autumn 1980): 423.
[14] Michel Chion, *The Voice in Cinema*, trans. Claudia Gorbman (New York: Columbia University Press, 1999), 154.
[15] *The Arbor*, directed by Clio Barnard (London: Artangel, 2010).
[16] Mette Kramer, "The Communication of Relational Knowledge in the First-Person Documentary," in *Cognitive Theory and Documentary*, edited by C. Brylla and M. Kramer (Cambridge: Cambridge University Press, 2020), 248.
[17] Berys Gaut, "Identification and Emotion in Narrative Film," in *Passionate Views: Film, Cognition, and Emotion*, edited by Carl Plantinga and Greg M. Smith (Baltimore: Johns Hopkins University Press, 1999); Richard Allen, "Identification in the Cinema," *The British Journal of Aesthetics* 52, no. 2 (April 2012): 197–200.
[18] Gaut, "Identification and Emotion in Narrative Film," 205.
[19] Allen, "Identification in the Cinema," 199.
[20] Gaut, "Identification and Emotion in Narrative Film," 207; Allen, "Identification in the Cinema," 199.
[21] William Rothman, "Pathos and Transfiguration in the Face of the Camera: A Reading of *Stella Dallas*," in *The "I" of the Camera: Essays in Film Criticism, History, and Aesthetics*, 2nd ed. (New York: Columbia University Press, 2004), 93.
[22] Gertrud Koch, "Blindness as Insight: Visions of the Unseen in *Land of Silence and Darkness*," in *The Films of Werner Herzog: Between Mirage and History*, edited by Timothy Corrigan (New York: Routledge, 1986), 84.
[23] Catriona Mackenzie, Wendy Rogers, and Susan Dodds, "Introduction: What Is Vulnerability, and Why Does It Matter for Moral Theory?" in *Vulnerability: New Essays in Ethics and Feminist Philosophy*, edited by Catriona Mackenzie, Wendy Rogers, and Susan Dodds (New York: Oxford University Press, 2014), 7.
[24] Mackenzie, Rogers, and Dodds, "Introduction: What Is Vulnerability?" 8.
[25] Anne Bartsch, "Meta-Emotion: How Films and Music Videos Communicate Emotions About Emotions," *Projections* 2, no. 1 (June 2008): 49.
[26] Anna F. Bialek, "Vulnerability and Time," in *Exploring Vulnerability*, edited by Heike Springhart and Günter Thomas (Göttingen: Vandenhoeck & Ruprecht, 2017), 217.
[27] Heike Springhart, "Exploring Life's Vulnerability: Vulnerability in Vitality," in *Exploring Vulnerability*, edited by Heike Springhart and Günter Thomas (Göttingen: Vandenhoeck & Ruprecht, 2017), 20.

[28] Nicholas Wolterstorff, *Journey toward Justice: Personal Encounters in the Global South* (Grand Rapids, MI: Baker Academic, 2013), 32; M. Louw, "Beautiful Justice and Just Beauty? Exploring Justice and Beauty from the Perspective of the Wronged," *Acta Theologica* 40, no. 2 (2020): 119.
[29] Nicholas Wolterstorff, *Hearing the Call: Liturgy, Justice, Church, and World* (Grand Rapids, MI: Wm. B. Eerdmans, 2011), 116.
[30] Roger Scruton, *The Aesthetics of Music* (Oxford: Oxford University Press, 1997), 379.
[31] Nicholas Wolterstorff, *Art Rethought: The Social Practices of Art* (Oxford: Oxford University Press, 2015), 310–311; Roger Scruton, *Beauty: A Very Short Introduction* (Oxford: Oxford University Press, 2009), 120.
[32] William Schweiker, "Vulnerability and the Moral Life: Theological and Ethical Reflections," in *Exploring Vulnerability*, edited by Heike Springhart and Günter Thomas (Göttingen: Vandenhoeck & Ruprecht, 2017).
[33] Schweiker, "Vulnerability and the Moral Life," 117.
[34] Schweiker, "Vulnerability and the Moral Life," 115.
[35] Jean-Luc Marion, *Being Given: Toward a Phenomenology of Givenness*, trans. Jeffrey L. Kosky (Stanford, CA: Stanford University Press, 2002), 306.
[36] Charles Mathewes, "Vulnerability and Political Theology," in *Exploring Vulnerability*, edited by Heike Springhart and Günter Thomas (Göttingen: Vandenhoeck & Ruprecht, 2017), 179.
[37] Schweiker, "Vulnerability and the Moral Life," 119.
[38] Matthias Christen, "Autobiographical/Autofictional Film," in *Handbook of Autobiography/Autofiction, Volume I: Theory and Concepts*, edited by Martina Wagner-Egelhaaf (Berlin: De Gruyter, 2019), 447.
[39] Jacques Derrida, *Memoirs of the Blind: The Self-Portrait and Other Ruins*, trans. Pascale-Anne Brault and Michael Naas (Chicago: University of Chicago Press, 1993), 41.

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SPECULATING THE VIRTUAL POLIS THROUGH ARCHIVETHING

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INTRODUCTION

To study the concept of virtual polis, we frame this research using our case study which is an artist-focused community of practice, digital platform, and archive space we call *archiveThing*. The driver for this emergent digital space is to reframe and rethink how archival systems have been formal cultural productions and spaces, usually not from the perspective of the artist's practice, and usually not focused on process, relationality, or as active and dynamic space for knowledge sharing practices. The virtual polis, we argue, needs active citizens (participation) and hence *archiveThing* is intended to be this type of space: open, communal, collective, social, with principles such as ethics and care undergirding collaborative potential. Where space potentially becomes place.

The *archiveThing* project sits at the edges of interdisciplinary discourse and practices – a collective virtual space, a mutable archive, an exhibition space, a publishing space, and a place that engenders discussion about artists' past and future works. Our tagging and metadata systems allow artists to position projects across many domains and media situating disciplines as "equal", not privileging any one approach to production of creative and discursive works. We ask how practices, artefacts, and events, can be shared and archived to include process, reflective frameworks and other discussions that are often peripheral yet key. We ask how to translate material works into digital forms. What is lost, what is gained and whose voices (works) are privileged? And importantly, how does a virtual presence (exhibition, output, works, writing, curations) complicate and complement the virtual polis? The paper will reflect upon insights from our case study of building the platform, started in the pandemic, now continuing as a slow and organic developing social collective practice. We will look at some theoretical framings that draw from fourth wave feminism, collective social-spatial practices, and media theory.

What is *archiveThing*?

archiveThing is an online platform - a social space for artists, designers, curators, writers and architects (we refer to all these practitioners as artists) to connect with local, national and international communities and audiences specifically triangulated through their work and self-defined related discourse. *archiveThing* is not only a connector-space it is a now-and-future archive space for artists to describe and share their works in their own voices with current and new prospective audiences. Using a critical methodology of counter-archive, we center artists' voices, working specifically from the ground-up instead of top-down archiving. *archiveThing*, developed in phases, in response specifically to artists' feedback. In conversation with artists using the platform the development team

added new working tools and functionalities, delivered in multiple languages. These features: secure Studio-Lab spaces to store and share portfolios of works; a publishing area for writings, reviews, conversations (The Fold); a Curatorial tool allowing invited curators to curate exhibitions on the public facing site; and a dynamically changing exhibition of works drawn from artists' portfolios where each refresh draws in a new set of works to highlight works by artists are all built in relation to conversations with artists using *archiveThing*. We employ a snowball method of invitation so that the community on the platform grows organically from within and equally embrace the slowness of this organic growth.

As an artist-driven space, artists maintain complete control over when to publish portfolios and associated content. Every piece of content artists share can be placed back on hold at any time to review, rethink, recontextualize – to maintain their contribution to the archive in their voice, in their time. Artists choose what and how they want to share representations of their work.

We have used the term artist-metadata as a contrast to the more formal, institutional, and technical metadata schemas. As educators of artists and practitioners ourselves, tuned to the discussions around thinking and making as social actors, we developed a series of 'metadata drawers' that can be used to store images, texts, audio-video, gif animations and arranged in a myriad of ways by the artist.

What is our artist metadata system?

- stories surrounding the making of artworks.
- a set of virtual archive-drawers to hold these stories.
- a dynamic system or catalogue of virtual drawers that artists can pick and choose from.
- artists are not required to use every drawer.
- each work or series can share as much or as little metadata that artists want to contribute.
- artists can easily and always return to add, edit or remove any metadata content.
- our metadata schema is purposefully meant to be open, dynamic, mutable and poetic.
- artists can use the space to discuss and show specifics about their work and processes in a cumulative manner akin to studio production.

The drawer system

archiveThing is a system with forty-two independent drawers that artists can use to build their unique portfolios and contribute their unique metadata. The sections below outline the potential for each set of 'drawers', organized into nine categories: **Images**, **Thinking**, **Process**, **Making**, **Methods**, **Technical**, **Object-as-Subject**, **Sharing**, and **Bibliographic**. Each drawer is a dynamic space for artists to work with. The layout and presentation for each portfolio is left up to individual artists. Drawers can contain as many images, texts, audio-video, links, and gif animation as needed.

POLIS AS EMERGENT VIRTUAL SOCIAL SPACE

We are interested in discussing the potential of practices and platforms that emerge through planning-with and involvement-of communities. We (the designers of the *archiveThing* platform) propose and consider this virtual social space as a place of co-determination and, equally, place to develop strategies and methods to imagine future works and connections for creative communities. Some fourth wave feminist and decolonial principles suggest that social activism, community organization and mobilization, and civic advocacy processes can be used to not only make policy changes at the level of the built-environment but also suggest inclusive methods to shape public space. And here we see a continuum from the physical environment to the virtual environment as an exciting and emergent potential public or social space. As a virtual community space, we imaged *archiveThing* as a

place; a place to build alliances, capacities and solidarities, to develop deeper discussion and discourse around artists practices, methods and outputs. Often these conversations occur through in-person studio visits, studio-seminars, or, during critical public exhibitions. In many jurisdictions, neoliberal city building practices have hurried the disappearance of actual spaces of production and dissemination that many artists communities continue to experience. Resistance against these realities and struggles suggested the possibility of *archiveThing* as an alternative place for these conversations and creative community practices that range across space, place, and time-zones - a virtual polis for creative communities of practice.

McLuhan's global village

The concept of the polis has traditionally been understood as a spatial and political organization rooted in ancient Greek city-states. However, as media theorist Marshall McLuhan has proposed, communication technologies redefine the structures of human relationality. McLuhan's notion of the global village, the idea that electronic media collapses all distances, creates a different kind of interconnected society and offers a compelling lens through which to reconsider the polis in the digital age. Media theory can illuminate some of these transformations of the polis by unpacking the polis as tool and potentially also as medium. With the global village we move from an oral to a digital participation, potentially resulting in a fragmentated public sphere; furthermore, in this trans-/post-human polis, rather than experiencing a natural flow of events, we encounter a mediated space driven by algorithmic governance.

It is important to notice that the polis of ancient Greece was structured around oral communication, with the agora functioning as site of free speech, deliberation and activities. This place of communal knowledge-sharing is not dissimilar to a digital platform. The original Greek agora functioned as a centrally located gathering place for politics, philosophy, art and commerce, while our new and mediated space, the digital polis replaces face-to-face interaction but is no longer bound by geographic constraints. If McLuhan[1] sees the 'global village' as the re-tribalization of humanity through electronic media, Ascott in contrast offers a cybernetic alternative where individuals co-create reality in a non-hierarchical interaction. Ascott's concept of the 'telematic embrace' offers a model of artistic engagement that is not passive but interactive. Ascott borrows from telematics as a concept for the computerization of society in the 1980s and sees telematic networks as a means to overcome hierarchical communication structures, allowing for distributed intelligence and co-creation.[2]

These shifts from the local to the global to a planetary infrastructure shape our current interactions and challenges we are facing today. McLuhan categorized media as either "hot" (high-definition, requiring little participation) or "cool" (low-definition, requiring active engagement).[3] While the original polis depended on cool media, i.e. debate, rhetoric, and public assemblies, the digital polis wants to take the form of "hot" media, where algorithmically curated contents shape our political discourses. Neil Postman in 'Amusing Ourselves to Death' warns that television and digital entertainment replace a substantive debate with a "spectacle".[4] Again, this language of the spectacle is not uncommon for activities in a polis and equally to ancient times they are still deliberate and potentially manipulative. To be more specific, Jürgen Habermas in 'The Structural Transformation of the Public Sphere' argues that mass media transformed the public sphere from a space of rational-critical debate into a domain controlled by commercial interests.[5] And to further extend this argument we must introduce how algorithmic filtering forms a "filter bubble" that creates a fragmented public.

As digital infrastructures increasingly shape political decision-making, the polis itself may be transforming into a posthuman gathering. Benjamin Bratton in 'The Stack: On Software and Sovereignty' argues that governance is already distributed across planetary-scale computation, with AI functioning as political actors.[6] In addition, Luciana Parisi in 'Contagious Architecture' explores

how algorithmic processes reshape urban and political structures, suggesting that governance is no longer strictly anthropocentric.[7] The posthuman polis truly challenges our classical understanding of a politically engaged society and raises fundamental questions about agency, sovereignty, and participation in an era of automated decision-making. Re-reading the concept of the polis through McLuhan's global village reveals both continuities and ruptures in how political communities are formed.

A digital platform needs to be dynamic, somewhat fluid to allow participation, foster inclusive representation, allow self-regulation, while being transparent in the use of ethical AI. By integrating these strategies, digital platforms can function as modern agoras, preserving the deliberative and participatory essence of the polis in the postdigital age.

How then do we think about *archiveThing* as a place to invite open discourse, to sit perhaps outside of the algorithms? Deliberately, we (the designers of *archiveThing*), allowed the platform to grow organically, responding to requests and conversations with our initial group of artist-testers. Embracing a slow-research methodology allowed us to unfold the platform as a place designed "for" creative communities "with" creative communities. Pushing against the speed and pressure of "just-in-time-delivery" products and the toxic spaces of "big" social media, as a post-capital gesture, we shaped "this" place in conversation with the growing community, considering new and future potential functionalities and offerings in relation to the organically growing polis on *archiveThing*. A form of "place-making" – a place sitting outside of real estate and market forces allowing focus on spaces for creativity, imagination and discussion. Recentering focus back on to the work of artists – as social actors interested in discussing issues, ideas, theories, through form, processes, materialities. a*rchiveThing* becomes a place to situate discursive objects, images, and ideas and to find communities to engage with in this social space and place. Borrowing from Henri Lefebvre,[8] the shaping of this place is shaped by us (community of creative practitioners), while we (as community) might be, in turn, shaped by this new type of polis. Place shapes us, we shape place as a cyclical social-spatial rhythm, acknowledging the technological, environmental, political realities that impact us are part of this social-spatial shaping of community.

A commons, a community place, a polis

We, as platform designers and community, have been considering *archiveThing* as a type of commons. The act of "commoning" can be described as a set of social-spatial practices of people working together to identify and manage shared resources, with the potential to engender practices of resistance and community building around issues important to that group. Commoning generally involves collectively agreed-upon processes and rules for governing, managing and stewarding a set of resources that are considered part of a social collective and important to communities. It is also, potentially, a set of dynamic practices with the prospective to "build linkages across diverse communities" – practices that take time, effort, and commitment to embody and enact a different form of collective sociality.[9]

Different communities will have different reasons spurring on their commoning work. Urban studies scholar and activist Melissa Harrison offers a definition that emphasizes an "ethico-political, resource-centred, bounded paradigm"[10] that is a "communal sharing of our fragile commons" (the resources), and "that cannot be separated from the sharing of our messy socio-political relations"[11] (as commoning). David Harvey also suggests that "the common is not to be constructed, as a particular kind of thing, asset, or even social process, but as an unstable and malleable social relation – this is in effect a social practice of commoning".[12]

These definitions suggest the ever-mutable, complex, messy practice that "likely" involves some kind of precarious resource and a set of either bounded or unbounded community members. There isn't

necessarily a singular stable model of commoning that we see emerging, given the multitudes of jurisdictional and social contexts with unique socio-political and spatial challenges. However, we see *archiveThing* as a place where these various theories of media, participation, community, practices are in conversation with the various practices of artists – this alignment, we propose, is a type of commons. A virtual polis, a shared resource (the platform) and the shared community, together - become a commons. Acting together to develop community in this place, then become acts of commoning.

This is somewhat reminiscent of artist-run centres in Canada. Over the past fifty years, artists have found spaces to set up galleries for exhibitions, performances, publishing and gathering – to specifically operate outside of the commercial art market. These centres grew as well from the ground-up, artists locating sites for this kind of cultural activity, often in affordable neglected areas of cities. Mostly, centres such as these have now experienced gentrification, and have found it necessary to set up in new distant jurisdictions, impacting communities and shifting cultural milieu. Against the struggle of diminishing affordable physical spaces, we also situate this platform – and our next phase of *archiveThing* considers how this spatial practice can continue to flourish as an emergent commoning practice.

CONCLUSION

Historian Timothy Snyder[13] has argued that one form of freedom is our ability to embrace unpredictability, an aspect of human behaviour that is essential to our flourishing. Snyder suggests this evokes a complex sense of ethics built around the ability to choose. We consider theoretically and practically the impacts of A.I., algorithmic predictability, data scraping and surveillance, on many aspects of our lives, including our work as artists. As artists and educators in an art college, we embrace and initiate many conversations about reflective practices and practitioners. It is part of the work done in the "studio" - taking time to reflect upon ideas, to create works, to present ideas in the form of discursive objects, performances, image works, to surface discussions in and with community to collectively chew on social, political, theoretical, philosophical issues impacting societies. This impetus drives our *archiveThing* project. That is, we worked to build a place that welcomes the familiar unpredictability of artists' practices as each practitioner, thinker, maker chooses their unique direction, materiality, form that their work will take. These choices derive from the intersecting complex experiences of their unique lives. As we continued to develop *archiveThing* we also embraced the unpredictability of people engaging with a "tool" designed with them in mind. Here, using a model of trust – that is building a trust for a community (a noun), and in trusting (as a verb) the voices of the community. We tested the edges of this virtual polis by sending artists to work together in physical residencies outside of Canada, the interface translated to embrace multiple languages was meant to draw in different ways of communicating; and we created a publishing space to encourage further discourse and discussions. How might these elements invite other types of rupture, and how would we embrace this? As always, we look for surprise, delight, and challenges that surface from these (human) activities.

Hannah Arendt argues that "the political realm of the polis rises directly out of acting together, the sharing of words and deeds. Thus action not only has the most intimate relationship to the public part of the world common to us all – but is the one activity which constitutes it…The polis is not the city-state in its physical location; it is the organization of the people as it arises out of acting and speaking together, and its true space lies between people living together for this purpose, no matter where they happen to be".[14]

These theoretical and practice-based processes have brought us to slowly develop *archiveThing,* as simultaneously social and spatial, as fluid space and living archive, as future cultural trust – a virtual polis to support an ever-growing connected creative community.

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COLLECTING COLLECTIVE MEMORIES – USING 3D MEDIA AS IMMERSIVE RECORDINGS TOWARDS HERITAGE PRESERVATION

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INTRODUCTION

In In today's fast-moving era, more and more traditions are ignored and neglected by the younger generation. Family businesses are forced to close since traditional crafts are not passed on to the next generation. In recent years, the awareness to document and protect these hidden treasures has been growing and many of the unique crafts have been enlisted as valuable and documented accordingly. However, plenty of the traditions, which may belong to smaller communities are at risk to be left out. With *"the idea of "living traditions", which is frequently regarded as a synonym for "intangible cultural heritage" and which, again, underscores the likelihood of a linkage between the tangible and intangible aspects of world heritage properties"*[1] conservation appears urgently necessary. Sharing with a wider community how to best capture these practices with currently commonly accessible technology also supports observing, appreciating and valuing these traditions. The autonomously captured material regrettably often lacks details and quality – and most obviously, a convincing representation of space and materiality.

This research investigates traditional craftsmanship, identifying methods, materials and cultural context of artefacts not only in the collection of museums, but on the streets and backyards of Hong Kong for a transfer to 3D capturing. Fieldwork, including interviews with artisans and practitioners of the crafts are one of the components to understand the most important aspect of crafts and objects. Encouraging the communities to document their unique traditions and crafts themselves with immersive visual recordings, including their personal narratives, will enrich the documentation significantly.

The collected materials provide a foundation for coming applications. Since stakeholders in the sphere of intangible cultural heritage have to prepare themselves for the next generation and wider distribution of AR/VR devices, which appeared already on the market, raising the bar for everyone involved, as Apple's convincing mixed-reality headset 'VisionPro' or similar undertakings by Google and Meta have proven.

THE OBJECTIVE

Usual documentations hardly pay justice to the actual objects, their haptic quality and the spatial process of their production.[2] With the development of imaging technologies which facilitate recording of actions and objects in three dimensions, new possibilities become accessible and support documentation beyond specialised high-end equipment. It has been argued since the early days of photography, that three-dimensional pictures inhabit a "tactile quality" and "celebrate the [...] material".[3] Despite its decline in commercial cinema, stereoscopic imaging and video has the unique ability to represent the third dimension which makes it the superior technique for documenting cultural heritage, but also for artistic undertakings, as examined in my previous research.

The technology employed in this research has been already established. While many heritage ventures use similar software and hardware, this undertaking differed from the familiar approach in two aspects: The first is that I used intentionally inexpensive technology, accessible to a wider community: for instance, affordable software, mobile phones and regular cameras. As Diane Zorich of the Smithsonian reflects on the required quality, "we didn't do everything to the same level and resolution".[4] The second is that while most similar endeavours present historically important and well-known buildings, artefacts and popular crafts, this pursuit sought to introduce everyday rituals of contemporaneous people living among us.

Testing and evaluating the accuracy and ease of use of a range of recent 3D capture techniques was part of this preliminary study to support transferring the craft methods and scanned objects into the digital world. This procedure is demonstrated through the presentation of a series of 3D scans and stereoscopic recordings with different techniques to document the process and the results.

Preservation Through Digital Documentation

The presentation of practices of production and application of these objects in a captivating stereoscopic 3D-format is one of the main objectives.

Different to most heritage preservation projects, this research focuses not only on the documentation of one aspect, but on the trichotomy of traditional craftsmanship, the resulting object and the actual application or connected ritual. The aim is to record the action as well as the objects in their spatial dimension and keep record of the materiality as well as the conditions of production. The resulting digital objects and artefacts are intended to be experienced in a wide range of techniques for future presentations and applications.

The importance of preserving the rich Chinese Cultural Heritage in Hong Kong for future generations seems undeniable, but complicated to achieve. These valuable traditions are crucial for society, as artistic practices can only remain relevant if they are also integrated into a highly technologized homogeneous culture. The First Intangible Cultural Heritage Inventory of Hong Kong contains 480 items, ranging from traditional craftsmanship to performing arts.

Nevertheless, how and by what means this heritage can be preserved, captured and documented remains difficult to elaborate and define. Family businesses are forced to close since traditional crafts are not passed on to the next generation. Much of that tacit knowledge, which may belong to smaller communities is at risk to be left out.

Therefore, with this ongoing research, I establish a method of crowd-sourced three-dimensional (audio)visual documentation of in/tangible cultural heritage that could be recognised as a best practice for future application. In this way, the trichotomy of craftsmanship in production, the resulting artefact and its ritual application can be captured three-dimensionally – not externally undertaken, but by the community itself through an insider perspective.

For my approach, I am following Sarah Corona Berkin with her concept of "horizontal production of knowledge", to acknowledge the manifold aspects about daily life which we ignore simply by

knowing to little about. Her response is a dialogue with all participants in a social context, enabling to listen to every voice and to recognize every facet of handed down customary practices.[5]

Figure 1. Typical flatbed trolley maker in Hong Kong (@ the author)

CASE STUDY: FLATBED TROLLEYS

Hong Kong possesses already an extensive list of heritage recordings, of tangible and intangible nature. Many crafts, artefacts and traditions are already well documented. For example, the famous lion-dance is recorded in many variations, from the different methods of crafting the head to the ritual of performing.[6] Other trades are listed, but often lack a thorough documentation. Especially the representation of the spatial dimension is not considered, although scale is frequently a significant aspect too, from the cramped workshops to the enormous metal pans in which chestnuts are roasted. These vocations might be left out of historical records or preservable traditions although they play an important role in the daily street scenes of Hong Kong. And that forms the focus of this research: the small everyday elements which are an essential part of the city, however not officially regarded worthy to protect.

With this perspective, aside from a touristic interest, the project began with a case study to examine the feasibility of the whole undertaking: Hong Kong's Flatbed Trolleys. These inconspicuous objects are everywhere to find in the cityscape, utilised in a wide range of different applications – from collecting used cardboard, assisting cleaners to move their utensils around, delivering water or fresh vegetables (Figure 1). They provide cost-effective transport in the narrow back alleys and lanes where no van could reach in an affordable and even environmentally friendly manner. At least, the Tai Kwun art centre acknowledged in an outdoor exhibition in 2020, how this device in all ist specific iterations is so central for the Hong Kong experience, when a range of different models was presented.[7] In that show, the focus was mainly on the objects itself and the diverse configurations, not so much on the back story.

For my approach, I asked two student assistants for support, who managed to communicate my intentions convincingly within the local community – in Cantonese. Our focus was hereby in finding the best method to document the manufacturing process and to get more insight first-hand from a trolley manufacturer. We then realised that only very few were remaining of a once lucrative industrial sector. Some who we knew from the pre-COVID era had seized to exist, mainly due to the economic situation but also the declining interest by the next generation to take over such a business. We quickly realised that the initial objective to introduce the techniques to the community and engage with them to record the objects and processes themselves, was not feasible. Our situation differed from Pat Wong's and Kai-chi Chan's invitation to shop owners to document their businesses.[8] The participants in that study received a 360° camera to record a walk-through of their shops which was then transformed by the artist/researcher duo to a point-cloud model.

Firstly, the recording with a 360° camera was at that moment in time still easier than the stereoscopic recording, especially under the team's guidance. Secondly, the shops provide a tangible environment for the recording. But most importantly, we were still evaluating to determine the best approach and equipment with this case study.

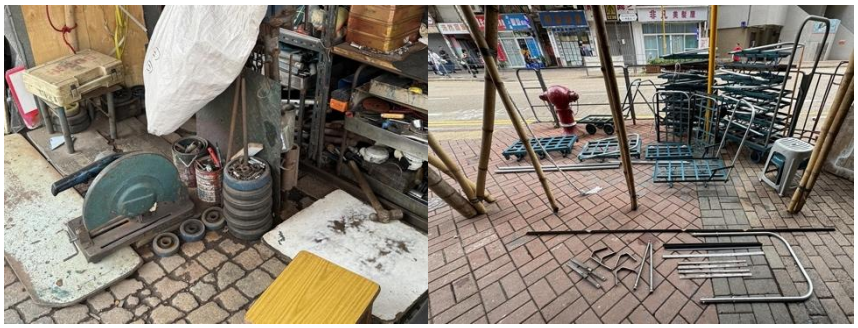

Figure 2a+b. The production environment of the trolley maker in Sham Shui Po, Hong Kong

The Manufacturing Process

Although I initially introduced the importance of the threefold for documentation, namely the manufacturing process, the object and its application, I will mainly focus in the following on the production.

After determining a trolley maker who is willing, yet even enthusiastic to share about his trade, my team went ahead to conduct an unstructured interview, mainly set as an invitation for the craftsman to share what he considers as important about his trade. The shooting took place on May 5, 2024 around noon at Shing Chong Trolley Cart 成昌鐵車, Sham Shui Po, Hong Kong.

The narrow space, squeezed into a corner of a building, determined the first challenge. During the construction of a trolley, the mechanic must spread the individual parts out on the sidewalk, the same sidewalk, where the finished products are stored, then to be stowed away at the end of his working day (Figure 2a+b). To find a good, steady position for the recording was nearly impossible as many passers-by were walking through this industrious area in Sham Shui Po. The team was equipped with two different camera set ups: a Canon R5 with a Dual Fisheye lens on a monopod and a handheld iPhone 15 Pro. A Zoom recorder with a wireless Sennheiser mic was used for the audio capture.

Dual Fisheye 180° VR

Canon's Dual Fisheye lens allows to record still images and life action videos in a stereoscopic format, capturing with its extreme wide-angle lens even more than 180° field of view. While initially obtaining footage with two distorted circles from the camera, the result becomes highly convincing once it is adjusted and viewed in a VR headset. Especially with small and challenging environments such as the space of the trolley manufacturer, it enables the audience to be fully immersed in that setting. The experience is truly engaging as not only the peripheral vision is covered, but also provides a stereoscopic view of the location a that enhances understanding of the space itself.

However, this seemingly ideal presentation comes with several challenges during the shooting. As the team had to remain flexible and opted to work with a monopod, requiring stabilization of the footage in post-production. Unusual for a fisheye lens is the necessity to keep focussing during the shooting, especially when the central subject moves back and forth. Additionally, the field of view is wider than expected, not only is everything within the hemisphere in front of the camera captured, but the other half of the lens also becomes visible in the final result (Figure 1, centre of the image).

Figure 3a+b. Trolley maker in Sham Shui Po, Hong Kong in his working space, still from recording with Canon dual fisheye lens unprocessed (a) and adjusted (b)

To acquire the 180° immersive video, the footage was processed with Mistika Boutique VR180 to be then viewed in an Oculus Quest (Figure 3a+b).

Spatial Video

With the continuous development of Apple's iPhone, advanced possibilities come easily within reach. Having worked previously with professional equipment for stereoscopic video recording, the spatial recording feature built in from iPhone 15 Pro onwards is rather impressive. (The feature is also available through an App for older models, see Figure 4). Initially supposed to be viewed on the Vision Pro headset, it is possible to convert the footage to Side-by-Side, a regular stereoscopic format that can be viewed on other headsets or with 3D capable screens or projectors.

We planned originally to use the iPhone to only document the shooting. However, the results were quite convincing, providing a good impression of the spatial dimension. The capturing procedure uses either the standard and the wide lens of the iPhone's camera array, which requires to shoot with the phone turned by 45° and displaying a preview only in a small window, making it quite challenging to record. Alternatively, the parallel normal and tele-lenses are used to record in landscape format with a good preview and result. The downside is, sufficient distance to the subject is required and hard to achieve in such a narrow space.

The field of view is much narrower and cannot provide a similar impression and overview as the very wide dual fisheye lens in tiny spaces such as in our case study. Although the spatial 3D impression is still convincing in the headset, it is by far not as immersive as the 180° footage that covers our full vision: the video image is presented within a frame in the headset.

For both recordings, the sound remained a big challenge. Although we used a clip-on mic, the noise from the street was overshadowing the interview. While for the spatial recording with an iPhone a boom-mic could be used, it would not be possible for the all-encompassing lens of the Canon camera.

The Object and its Application

As the recording of the production process is within this project the most challenging part, I only introduce the other elements of this research briefly. Each component aims to create spatial representations, necessitating the use of various :

- The craft (production) → stereoscopic video
- The artefact (object) → 3D scanned model
- The ritual (application) → stereoscopic photo/video

Figure 4. Side by Side export of recording with the Spatial Camera function on iPhone 12Pro

For the case study concerning the trolley, capturing in 3D with the resolution the mobile phone provides is not as straight forward as for other artefacts. The metal bars are thin and difficult to record, the handle could be shiny and reflective. For most similar sized objects, I obtained convincing results with the iPhone and the 3Dscanner app, using either LiDAR or for smaller details the structured scan with the true depth option (Figure 5).
For the metal cart, these options did not yield any presentable results. However, with LumaAI, the visual result is highly convincing, applying neural-radiance-field algorithms to the recorded data. In such difficult cases, the obtained rough 3D model could serve as a foundation for advanced modelling, although the valuable patina of the old and worn vehicles would be challenging to simulate. The application of the product in its general usage or traditional rituals should be recorded with 3D stereoscopic photography or video. In the case of the flatbed trolleys, they are part of an ongoing photo-series – a tribute to the late photographer Michael Wolf – mostly captured in S3D, to highlight all the different functions and modifications of the metal vehicle. While having tested several recording methods, the result of the iPhone's spatial capture is fairly convincing, especially under consideration of its ease of use and reach. The spatial images were converted to side-by-side images and combined in Photoshop to anaglyph images. This format is easiest to print and to distribute, although lacking accuracy in colour.

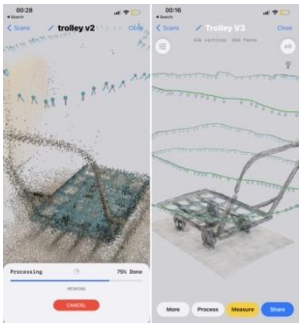

Figure 5. Capturing process of a flatbed trolley with the 3D scanner App

CONCLUSION

Although the team familiarised themselves with the equipment in advance, the actual shooting became more challenging due to several reasons. Mainly the on-location situation in the narrow and crowded space increased the difficulty of the shooting. The camera and sound set-up needed to be versatile, easy to move around due to the space limitations, unfortunately, the noise was overwhelming in the location, complicating the recording. However, even with all the technical flaws, the on-site interview proofed much more rewarding than any interview in a studio environment. The impression of the busy and tiny space, especially when viewed in 3D could not be transported with other means. Also, the interviewee was more relaxed and was able to demonstrate different tasks and assets to the camera.

During the interview itself, the trolley manufacturer appeared pleased to share his experiences and challenges. I realised that the community engagement does not necessarily require them to record their experience by themselves but rather be able to communicate their stories with others. Nevertheless, the ease of capturing still plays a significant role as this project should reach out to a wider group who will be able to record more local narratives about overlooked and potentially soon-to-be-forgotten crafts. My endeavour into the of 'horizontal acquisition of knowledge' proved to be quite fruitful, when the trolley maker was shown the resulting movie of his work, he seemed proud to be empowered to join the dialogue.

Although this case study mainly served to determine the feasibility of this concept, I am looking forward to continue and expand the project with adequate funding, not only to record more inconspicuous elements to be archived and shared in public exhibitions, but also to provide workshops for wider communities.

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APPROACHES TO KEEP HONG KONG'S SHEK KIP MEI PARK FOUNTAIN VIRTUALLY ALIVE

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INTRODUCTION

Once situated within Shek Kip Mei Park in Kowloon, a fountain featuring an integrated waterfall exuded a distinctive charm rooted in a past era, emblematic of the forward-thinking architectural ethos of the 1980s. The three-story edifice, adorned in pastel pink and light blue tiles, held significant popularity among local residents. An article from a 1982 local newspaper indicates that the 7.5-hectare Shek Kip Mei Waterfall Park, even in its initial phase of development, was the largest of its kind in Hong Kong, swiftly becoming a favoured recreational destination for the community.[1] The cascade's design was not only aesthetically striking but also functional, with its cantilevered roofs providing shelter from heavy monsoon rains and intense heat during outdoor activities, while also serving as an open-air setting for art classes.[2] Over time, however, the fountain's water mechanisms fell into disrepair, and the structure itself succumbed to weathering and decay. Like numerous other overlooked urban landmarks, the fountain risked being relegated to mere memories preserved in family photographs, a fate all too common for public infrastructure in a city known for its scarcity of land. Its demolition occurred recently and while waiting for its revival in vain, the structure was digitally captured to be replicated in VR, our team could employ diverse techniques to document the park fountain complex comprehensively.

THE OBJECTIVE

Investigations into further details about the architect, who planned this area have not yet been fruitful. Research in the public records did not yield any useful information yet, even though the compound was quite an attraction for the neighbourhood in its heyday.

Based on the significance of the artificial waterfall, the central water basin, fountain and its winding walkways on multiple levels, we associated the construction with a dormant serpent or even a petrified dragon. In Chinese mythology, water and dragons inhabit great importance. Dragons appear in different types, shapes, colours and contexts. Commonly, they are known for their auspicious powers, in particular for controlling water forces and the weather. Their body is frequently depicted as a composite of different animals: snakes, turtles, fish, and alligators. In the historic national emblems of China (1912–1927) and Hong Kong (1959-1997), the dragon represents courage. Today, the dragon is still a symbol that is officially used by the Hong Kong Tourism Board.

With its location in the centre of Kowloon, nestled on the slopes at the base of Lion Rock, it almost suggests itself that the shape of the fountain in Shek Kip Mei Park must have been inspired by the

body of a dragon. According to the legend, the eight mountains surrounding Kowloon (九龍) are often referred to as dragons. This is also the origin of the name of the peninsula: gau (nine) and lung (dragon), also counting the Song emperor Bing.

Figure 1a. Shek Kip Mei Park Fountain, August 2024. All images ©2024-25 the authors

Figure 1b. Shek Kip Mei Park construction site, February 2025.

When the once tranquil oasis defined by its aquatic allure succumbed to the ravages of time and environmental exposure, the waterfall and the kiosk, which had occupied one of the two pavilions, were long non-functional, and the tiled surfaces had deteriorated gradually.

In an effort to virtually preserve this fading landmark, our team has utilised advanced digital documentation techniques. Building upon earlier work involving 360° imaging and photogrammetry based on drone imaging, we have expanded our methodology to include 180-degree VR recording using a Canon Dual Fisheye lens, as well as LiDAR scanning to capture the fountain's spatial details with meticulous precision.

The overarching aim was to turn this comprehensive 3D dataset into an immersive virtual reality experience which could provide the foundation for various content. This might contain historic and architectural information, serve as the platform for games or education for martial arts (as it was regularly practiced in the garden by nearby residents), or as an artistic project. Our creative approach seeks to harmonise the realistic representation with abstract interpretation, an attempt to highlight the fountain's progressive decay, offering future audiences an opportunity to engage with and appreciate this distinctive facet of Hong Kong's architectural legacy. Through this digital reimagining, the fountain's essence can endure in an immersive format, even as its physical form had eroded until it was razed.

Drawing on our previous expertise in digitally documenting neglected and transient environments, we were investigating a range of methodologies to encapsulate and convey the distinctive sensory

qualities of the Shek Kip Mei Park Fountain within a virtual framework. This endeavour pursued to not only preserve the physical attributes of the structure but also to capture its atmospheric and experiential essence, ensuring that its unique character is accessible to future generations in an immersive digital format.

Approach 1: Cinematic Documentation

Based on our previous research to digitally preserve and recreate a landscaped garden in Singapore, we explored several techniques, including omnidirectional video, photogrammetry, and 3D modelling. This work resulted in a series of VR experiences, ranging from free artistic interpretations to highly detailed photorealistic representations: “Gone Garden”, “Yunnan Garden VR”, “Flux Garden” and “Garden of Changes”.[3] Drawing from our experience, we are leveraging a diverse toolkit of digital approaches to faithfully convey the essence of the Shek Kip Mei Park Fountain, adding attempts with new technologies. Our goal is to enable virtual visitors to wander through and experience this overlooked architectural gem, preserving its unique atmosphere and sensory qualities now, as the physical site has disappeared.

Cinematic VR 360

In our previous project Secret Detours (2017), we focused on capturing Singapore’s Yunnan Garden before its redevelopment. As consumer 360° cameras lacked the resolution and image quality back then and professional solutions were not within our reach, we employed an array of three GoPro cameras with wide angle attachment to record several life action scenes with dancers, connected to the original layout concept of the garden. The engagement with the moving protagonists invited the audience to look around in the immersive presentation and to perceive a sense of the atmosphere, an impression of being in the garden.[4] After expanding the project to different 6DOF VR experiences, we realised that the spatial perception of the location enhances the sense of place significantly. Therefore, we only recorded a 360° walkthrough over the Shek Kip Mei Park footbridge for completion, not as a standalone project, this time with an Insta360 X3 camera. The camera was mounted on a dedicated ‘invisible’ selfie-stick and stabilised within the camera. The recording was supposed to capture the surface for potentially being mapped on a 3D model or serve for future applications. Inside the headset, it still provides a convincing representation of the space’s dimension. In hindsight, this walkthrough would have benefited through the engagement of protagonists inhabiting the concrete complex and would have provided the backdrop for an potential independent cinematic VR project.
However, the recordings were monoscopic and one of the most important takeaways from our previous research has been that viewing the environment in 3D is far more convincing.

Dual Fisheye 180° VR

These findings sparked enthusiasm for the possibilities offered by Canon’s Dual Fisheye lens for the *R5* camera.[5] Although 360° video provides a highly immersive experience, as explored in previous research, it is often constrained by limitations such as lower resolution and the complexities of post-production stitching.[6]
In comparison, the 180° hemisphere captured by two parallel lenses provided a more practical compromise, offering sufficient detail and depth representation when viewed through a VR headset (Figure 2). The built-in stereoscopic capability further enhanced the immersive experience, surpassing the limitations of monoscopic 360-degree footage.
Nevertheless, the fixed configuration of the lenses restricted the ability to fine-tune the 3D offset, which is crucial for achieving optimal depth perception across the entire scene. While the technique

proved effective for capturing nearby elements such as benches and pavilions, it fell short in conveying the full scale and spatial dimensions of the expansive Shek Kip Mei Park Fountain complex.

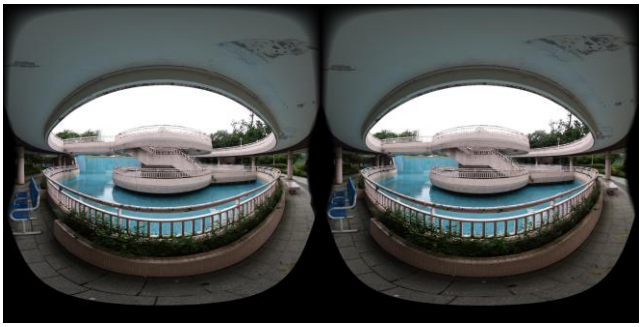

Figure 2. Shek Kip Mei Park Fountain captured through the Canon dual fisheye lens

Despite these limitations, the team identified the Dual Fisheye lens as a highly effective tool for immersive recording, and especially for live-action footage. While it could not independently capture the monumental scale of the architectural landmark, the setup proved exceptional for documenting live-action and performance-based content, delivering a compelling immersive experience in a headset without the need for a full 360° sphere.

Spatial Video

With the introduction of Apple's 'Vision Pro', new kinds of content can be created. Since the iPhone 15 Pro it is possible to record spatial video thanks to the multiple lenses and the integrated elaborate algorithms. Apps such as 'SpatialCamera' allow to convert the recorded footage to the common SBS (side-by-side) video format for play out on less expensive-headsets such as the 'Oculus Quest'. We recorded several walks through the grounds, mainly with the purpose to generate as much footage as possible while the park still existed and to be then used as footage for Gaussian Splatting. While the stereoscopic effect of the spatial video is convincing, especially in regard to its ease of recording compared to other stereoscopic techniques, the sense of immersion is inferior to the above described methods which cover the viewers peripheral vision. Viewing the spatial video in the headset still comes with a frame that conveys the awareness of watching a video instead of supporting real presence. However, on screens or projections that support S3D footage, and even with anaglyph methods, these recordings look quite convincing.

Approach 2: 3D Reconstruction

Lidar Scan

One of the team's strategies was digitising the Shek Kip Mei Park Fountain to create a VR walkthrough experience utilising the 'Leica BLK 360 LiDAR' scanner.[7] While this method effectively captured the spatial dimensions and structural characteristics of the fountain, the process was more labour-intensive than initially anticipated. Challenges arose due to the scanner's limited range of approximately 6 meters and its sensitivity to interference from reflective or perforated surfaces such as water and wire mesh. To comprehensively map the entire environment, the team had to conduct 130 overlapping scans. The collected data was subsequently merged and processed using Leica's 'Cyclone' software and 'Blender' 4.

Figure 3. LiDAR scan of Shek Kip Mei Park fountain, point cloud

To streamline the scanning process, the team operated the scanner remotely via a mobile app. This approach resulted in unsatisfactory texture quality. While the point cloud visualisation provided an abstract yet immersive representation of the fountain's spatial qualities (Figure 3), it fell short of achieving the photorealistic detail required for the final VR experience. This underscored the need for supplementary techniques to improve the visual fidelity of the reconstruction. Despite these limitations, the initial LiDAR scans laid a solid groundwork for further development, particularly in creating abstract visualisations suitable for virtual reality headsets.

Acknowledging the constraints of the LiDAR approach, the team continued with 3D modelling and subsequently explored an innovative technique known as Gaussian splatting (GS3D), which is detailed in the following section.

3d Modelling In Blender

Based on the captured video footage and the laser scans, a 3D model was created. With its details and texture, based on the source material, it appears convincing on first glimpse and in overview angles. However, with the close scrutiny that VR enables, all the flaws and superficiality shows when studying some details. Further experiments with AI-assisted asset generation are required.

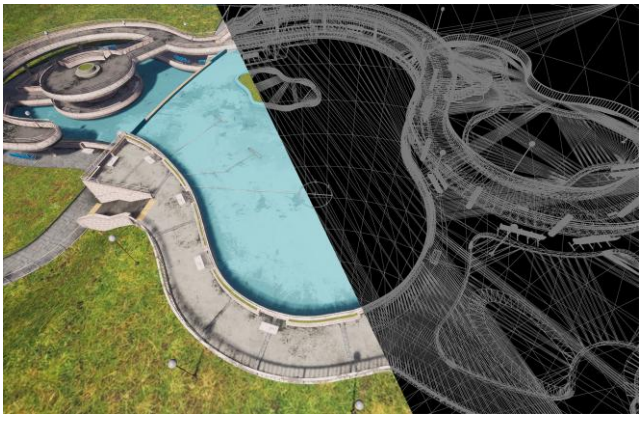

Figure 4. 3D model of park, textured (left) and wireframe (right)

Figure 5. Photogrammetry reconstruction of kiosk

Photogrammetry

Over the past two decades, significant advancements have made photogrammetry tools both accessible and highly effective for 3D reconstruction of heritage sites. Having previously worked with photogrammetry in our project on the reconstruction of a tropical garden ("Yunnan Garden VR"), we were already familiar with its strengths and limitations.[8] While photogrammetry excels in reconstructing hard, static surfaces, it proves less effective for small, convoluted objects like overlapping tree leaves, which create a near-infinite number of occluded areas.

In our efforts to employ 3D reconstruction techniques for creating a digital twin of the Shek Kip Mei Park, we used photogrammetry to benchmark and compare results against the still emerging Gaussian Splatting method. Our focus was on two key areas: the simplified pavilion seating area constructed from concrete and wood, and the kiosk area with its adjacent staircase located in the park's centre.

Using 'Agisoft Metashape', we successfully achieved detailed reconstructions of the park's hard surfaces, including the concrete floors, walls, and seating area. However, the photogrammetric model struggled to replicate finer details, such as the intricate handrails at the kiosk staircase. This reinforced our understanding that while photogrammetry is highly effective for reconstructing detailed, solid surfaces, it falls short when it comes to complex, small overlapping objects like fences or leaves.

Gaussian Splatting

Gaussian splatting, an innovative technique within the fields of computer graphics and computer vision, leverages machine learning algorithms to compute the parameters of individual Gaussians in 3D space. This technique has shown significant promise in applications such as reconstructing surfaces and images from sparse, scattered data points. Its ability to handle irregularly sampled data makes it particularly valuable for tasks like point-based rendering and 3D reconstruction. As such, Gaussian splatting presents an intriguing option for our project, given its potential to overcome the challenges posed by uneven sampling of data.

Considering the intricate and highly detailed environment of the Shek Kip Mei Park Fountain, we believe that experimenting with Gaussian splatting could yield promising results. In our initial exploration, we utilised video footage captured while traversing the park to inform our approach. This preliminary investigation aligns with the conceptual framework established in recent research. Specifically, we based our methodology on the framework outlined by Kerbl et al.[9] and the scripts provided by Stephens.[10] The first test, which closely resembled a photogrammetric approach, focused on capturing detailed surface data from a static scene near the kiosk area. (Fig. 6)

The results from this initial trial were compelling, with the processing time significantly reduced compared to traditional photogrammetric techniques. This efficiency motivated us to further extend our experimentation. Building on this success, we applied the Gaussian splatting technique to aerial

survey footage collected during a 1.5-minute flight that circled around the park area. From the resulting video, we selected every 10th frame for training the Gaussian reconstruction model, running iterations of 30,000 to refine the results. The outcome, as illustrated in Fig. 9/b, is highly detailed and photorealistic when viewed from specific angles close to the flight path, or at similar altitudes. However, upon closer inspection, the reconstruction reveals some shortcomings in detail, particularly in the structural elements (Fig. 8). Despite this, the aerial reconstruction serves as an excellent overview of the entire park, offering a bird's-eye perspective that is highly valuable as a general reference for the site.

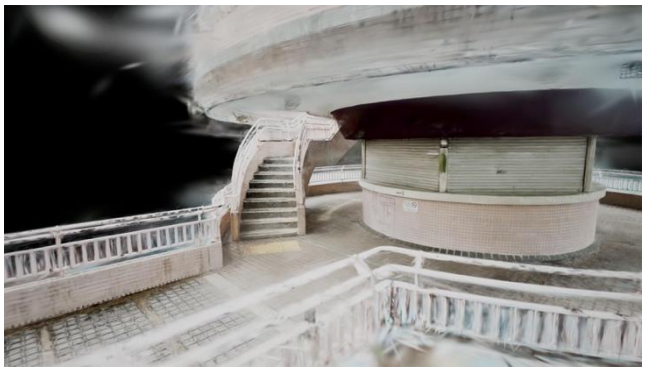

Figure 6. Gaussian Splatting reconstruction of kiosk area

Figure 7. Detail of Gaussian Splatting reconstruction of kiosk area

Figure 8a/b. Detail of Gaussian Splatting reconstruction from drone footage

EVALUATION AND DISCUSSION

The various methodologies we explored – capturing, recreating, or reconstructing the park – each have their strengths and limitations, depending on the type of experience the final outcome is meant to convey. For providing a broad overview of the park, a bird's-eye perspective, generated through Gaussian Splatting reconstruction from a drone flight, proves to be the most effective approach. The elaborate details of the park's lush vegetation, from its majestic trees to the smallest plants, are captured with remarkable clarity, contributing significantly to the park's overall ambiance.

However, limitations become evident when the viewpoint strays too far from the original camera positions – specifically, the drone's flight path height. For example, zooming in on built concrete structures results in fragmented and low-detail visuals, while attempting to view beneath elevated walkways produces abstract, incomplete imagery. Despite these shortcomings, for the purpose of delivering a general overview – whether as an interactive 3D model on a flat screen or in VR – these limitations are acceptable.

For a fully immersive, room-scale, walk-in VR experience, however, a higher level of detail at eye level is essential – mirroring the perspective of a park visitor. Our Gaussian Splatting reconstructions of smaller, enclosed spaces, such as the ground-level kiosk area or the seating pavilion, have shown promising results. These reconstructions appear highly detailed and photorealistic when viewed from angles close to the original filming positions. Yet, while the level of realism is striking, the spatial perception weakens noticeably when tilting the head in VR or observing areas that were not meticulously pre-recorded. (Fig. 7+8)

Creating a digital twin of the environment is one part – to make it engaging for a general audience another. Similar to our previous project, "Yunnan Garden VR", the detailed photorealistic model will serve as a stage for a range of different artistic interpretations. In this further step, besides the creation of different content, we aim to combine the several models, for example the 3D reconstruction with the point-cloud, to explore further creative approaches.

Figure 9. Gaussian Splatting reconstruction from drone footage.

CONCLUSION

The team's exploration of different techniques for digitally capturing the Shek Kip Mei Park Fountain has yielded valuable insights and presented unique challenges. In our technical explorations, we briefly experimented with VR180, but the limited viewpoint restricted its potential, while offering a photorealistic stereoscopic experience. LiDAR scanning provided a detailed understanding of the park's structure, however, the recording of the surface and texture was unsatisfactory. Photogrammetry has proven effective for reconstructing rigid surfaces, however resulting in a coarse 3D-model, while Gaussian splatting has shown impressive results in capturing intricate details, although its integration into VR environments requires further refinement to overcome these

limitations and harness its full potential for immersive visualisation. As this technique is only recent and we already observed significant improvements during the past year, we are optimistic that Gaussian Splatting will further evolve to enable a speedy recreation from basic footage of architecture and heritage that might be destined for the demolition ball, before its aesthetic and cultural value may be recognised.

Even if the structural details are not yet as precise as in the 3D model, the impression of the general atmosphere of the park with all its sub-tropical flora contains a high level of realism. Acknowledging the park's dynamic nature, we aim to add vibrant elements to the virtual environment, blurring the lines between the digital and real-world experiences. Through these nuanced details, the team aims to deepen audience engagement and create a more immersive experience.

We believe that our approach has proven to be a viable solution for situations where immediate responses are required and there is no time to waste. Then Gaussian Splatting provides a rapid method that lacks detail and precision compared to other methods, but given its fast development, it is certain to deliver significantly better results in the near future, even with the same footage.

NOTES

[1] Anon., “石硤尾瀑布公園昨由羅德彰揭幕,” *The Kung* Sheung *Evening News*, Hong Kong, June 13, 1982, p.3
[2] Manuel Castells, Lee Goh and Reginald Yin-Wang Kwok, The Shek Kip Mei Syndrome: Economic Development and Public Housing in Hong Kong and Singapore. (London: Pion Ltd., 1990).
[3] Elke Reinhuber, Ross Williams and Benjamin Seide, “The Scale of Immersion: Different audio-visual experiences exemplified by the 360° video Secret Detours,” *The Electronic Visualisation and the Arts London 2018 conference* (2018), accessed: February 1, 2025, doi.org/10.14236/ewic/EVA2018.45]
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BETWEEN ATTENTION AND DISTRACTION: A STUDY ON IMMERSION IN INTERACTIVE VIRTUAL REALITY CONTENT

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INTRODUCTION

The prevailing discourse on perceptual experience in virtual reality (VR) primarily focuses on immersion. Immersive experiences are often discussed in terms of presence—where users feel transported to another space—or flow, a deep state of focus with minimal awareness of the real world. However, in the realm of VR art, interactive VR films and animations challenge these established frameworks due to their complex narratives and audience interactions incorporating gaming elements.

This article explores how audience perception in interactive VR content unfolds as a continual shift between attention and distraction. As a theoretical foundation, Walter Benjamin's concept of "reception in distraction" is examined through Jonathan Crary's perspective. For the case study, the interactive VR animation *From the Main Square* is selected because it provides immersive experience to audience and offers new ways of thinking about perceptual modes in VR. First, the VR content and a viewer's responses are analyzed based on recorded footage of the VR experience. Second, focus group interviews with expert participants are conducted and analyzed. In conclusion, this study suggests that immersion in VR progresses through varying levels of engagement, where audiences alternate between attention and distraction, rather than experiencing a continuous, uninterrupted flow. Ultimately, exploring the in-betweenness of attention and distraction in VR experiences is expected to broaden the understanding of perception in interactive VR content and contribute to the design and development of storytelling interaction in such works.

To describe immersion in VR, the key concepts widely used are flow, cognitive absorption, and presence. Individuals in a flow state become "so absorbed in their activities that irrelevant thoughts and perceptions are screened out." Presence is defined as the subjective experience of "being in one place or environment, even when physically situated in another."[1] In virtual environments, presence refers to experiencing the computer-generated world rather than the actual physical surroundings.[2] These concepts are primarily examined in user experience (UX) studies, particularly in the design of games, simulation training content, and service-oriented software.

To measure presence, as a state of cognitive absorption, Bob Witmer and Michael Singer developed a questionnaire incorporating four factors: control, sensory, distraction, and realism.[3] Among these factors, distraction has an inverse relationship with presence—the lower the distraction, the higher the sense of presence. In VR games like "Beat Saber" or service platforms like "Spatial" and "VRChat," achieving a sense of presence is crucial.[4] For such applications, minimizing awareness of the

surrounding physical environment and maximizing cognitive immersion in the virtual world are essential objectives.

A possibility of new modes of perception in VR

However, perceptual experience in VR extends beyond these prevailing conceptual discourses. First, VR technology is not limited to gaming, simulation training, or service platforms but is also being experimentally explored in artistic fields such as film, media art, and performance. Artists strive to shape audience experiences because the VR experience itself is crucial, as it is deeply intertwined with the audience's understanding of the artwork. Digital artworks can be understood as "experiments in interaction design."[5] If the act of viewing an artwork is considered an interactive experience, then interaction in VR artworks holds aesthetic significance for the audience. Artists experiment with various sensory experiences when designing VR content rather than solely aiming to achieve cognitively immersive states. This demonstrates that the aesthetic experience in VR artworks and user experience (UX) in service-oriented VR applications function with fundamentally different orientations.

The second reason why VR perceptual experience extends beyond prevailing concepts is that, VR technology can broadly reflect cognitive experiences in the real world as a form of "reality media." Reality media is defined as media forms that "explicitly interpose themselves between us and our visual, auditory, or tactile perception of the everyday world."[6] This implies that the media itself serves as an object of perception. Since people perceive the real world through their senses, reality media presents the world shaping how reality is perceived directly through visual, auditory, and tactile formats. VR technology functions as a medium that redefines reality, allowing people to experience an alternate world through sensory modalities. Therefore, the VR experience cannot be confined to a purely cognitive state of absorption.

To further explore the perception of reality through VR media, it is essential to consider Walter Benjamin's concept of "reception in a state of distraction."[7] Benjamin argues that film, as reality media, is perceived "by a collectivity in a state of distraction."[8] Here, distraction (Zerstreuung) refers to a "dispersion or scattering of perception" and is defined as the "opposite of concentration (Konzentration or Sammlung)."[9] In this context, he declares that "distraction and concentration form polar opposites," positioning attention and distraction as fundamentally distinct states.[10] Meanwhile, Crary defines attention and distraction as perceptual states that "ceaselessly flow into one another." According to his view, these states paradoxically exist on a single continuum, and shift as a dynamic process, "intensifying and diminishing, (…) according to an indeterminate set of variables."[11] Furthermore, it seems that attention always contains "the conditions for its own disintegration" within itself and is "haunted by the possibility of its own excess."[12] What becomes clear is that attention is a "volatile concept."[13]

The concept of reception in distraction applies not only to media but also to spatial perception. Benjamin, as is well known, presents both film and architecture as paradigms of the paradoxical cognitive experience in which we perceive while being distracted. In particular, he describes how people absorb buildings "noticing the object in incidental fashion" or through "inadvertent attention (einem beiläufigen Bemerken)" emphasizing that this process is "consummated by a collectivity in a state of distraction."[14] Unlike the concentrated attention directed toward a painting, where the viewer is absorbed "by" the artwork, in the case of buildings, the observer "absorbs" them in the state of shifting between attention and distraction, oscillating between voluntary and involuntary attention.[15]

The reception of architecture, as a work of art, resonates with the perceptual experience of participants in a VR environment, where multiple stimuli are scattered throughout the space. In this virtual setting, audiovisual information and controller interactions continuously draw participants' attention, often

overwhelming them with simultaneous distractions. This interplay mirrors Crary's notion that attention and distraction "ceaselessly flow into one another."[16]

Distraction has been considered quite negatively as a disruption of stable or sustained perception. But Benjamin's perspective on distraction suggests that the way people perceive and engage with film and architecture only differs from traditional art forms, which require focused contemplation. It also implies that the collective mode of reception reflects the way modern technologies shape sensory experiences, making distraction an integral part of how people engage with media and environments.

CASE STUDY: *FROM THE MAIN SQUARE*

An interactive VR animation, *From the Main Square* provides an immersive experience for the audience while simultaneously offering possibilities to redefine modes of perception in VR as a continuous shift between attention and distraction. The fundamental mechanism driving the narrative is a single audience member wearing a Head Mounted Display (HMD) to "look around" engaging with the 360-degree environment. The story unfolds through a series of animated scenes—referred to as events—that take place in all directions around the main square. If the audience does not actively look around, the animation does not progress, waiting for engagement. Additionally, there is one more interaction element that influences the progression of the experience: in certain events, participants must pull the trigger on the controller to play the scene. To summarize, the progression of the animation is driven by two primary interactive gestures: turning one's head to look around and pulling the trigger on the controller to activate specific events. Every event, scene, and sound unfolds around the participant, who is positioned at the center of the main square, creating a fully dynamic immersive experience.

From the Main Square is a seventeen-to-twenty-five-minute VR animation directed by Pedro Harres, and it was premiered at Venice Film Festival with a Grand Jury Prize in Venice Immersive 2022. This VR film allows audience to witness the rise and fall of a city over time, centered around a single location: the "main square." The story begins with a local resident lighting a fire, gradually evolving into scenes of urbanization and modernization as outsiders arrive. Forests and grasslands give way to homes, buildings, religious institutions, a zoo, and power plants, reflecting societal development. However, conflicts emerge among people from diverse backgrounds, escalating into broader group tensions. A murder incident eventually triggers chaos in the city, culminating in the catastrophic explosion of a power plant, leaving the city in ruins. In this piece, as the story progresses, viewers naturally interact by shifting their gaze, head, or body direction, which influences the way events unfold around them. The experience is designed to be non-linear and exploratory, meaning that depending on where and how the audience looks, they may perceive different aspects of the evolving city.

The interactive experiences of the case are analyzed using two methods. First, it is an analysis of one person's views and movements based on recorded footage of the VR experience. One of the recorded footages from non-expert college students is used for the analysis.[17] The other method is the focus group interviews with nine VR experts, including a VR director, engineers, animator, designers, sound designer, and academic researchers.

Analysis on a VR experience footage

No.	Timeline	Content		Viewer's response	
		Events	Visual, auditory, and haptic stimuli	Turning one's head	Pulling the trigger
1	05:55	A television antenna installer reaching to the local residents			
2	05:56				
3	05:57				
4	05:58		Bicycle bell ringing sound		
5	05:59	(not clear)		O	
6	06:00	Two people riding bicycle		O	
7	06:01	One person doing barbeque		O	
8	06:02	(not clear)		O	
9	06:03	The mansion		O	
10	06:04	(not clear)		O	
11	06:05	(not clear)	Controller vibration	O	
12	06:06	Television antenna installer		O	
13	06:07	Television antenna installer & the local residents	controller vibrations, color changes & a floating hand		
14	06:08				
15	06:09				
16	06:10				O
17	06:11				
18	06:12	A conflict and trouble between the television antenna installer & the local residents			
19	06:13				
20	06:14				
21	06:15				
22	06:16				
23	06:17				
24	06:18				
25	06:19				
26	06:20				
27	06:21	(not clear)		O	
28	06:22	(not clear)		O	
29	06:23	(not clear)	controller vibrations, color changes & a floating hand	O	
30	06:24	local residents watching TV			O
31	06:25				
32	06:26		Whistling sound		
33	06:27	(not clear)		O	
34	06:28	local residents watching TV using a remote control	controller vibrations, color changes & a floating hand	O	
35	06:29				O

Table 1. Timeline-based analysis of events, stimuli, and viewer responses in From the Main Square

As analyzed in Table 1, the viewer initially focuses on a particular scene or event but then reacts to visual, auditory, and haptic stimuli, shifting one's gaze and body movements in search of new events. Examining the table from entry No.4 to No.12, it appears that the viewer continuously looks around, turning their head. Just before this period, the footage shows a single event without any recorded movements. However, the sound of a bicycle bell ringing triggers the viewer to search for the source, prompting him/her to look around. Therefore, this phase (No.4 to No.12) suggests that the viewer is in a distracted state.

Meanwhile, at 06:05(No.11), the controller begins to vibrate, signaling the viewer to search for a specific event. The viewer identifies the event at 06:07(No.13), then remains still before pulling the trigger on the controller at 06:11(No.17). The subsequent period, from No.18 to No.26, indicates a shift to an attentive state, as the viewer focuses on a single event—the conflict between the television antenna installer and the local residents.

According to the VR footage analysis, various elements within the virtual environment, designed to attract the audience's attention, paradoxically end up disrupting their concentration. Viewers experience a cycle where they focus on a specific scene, get distracted by stimuli, then discover a new event, refocus, and repeat the process. This constant fluctuation in cognitive states demonstrates how immersion in VR is not a static experience but rather a dynamic interplay between attention and distraction.

The director, Pedro Harres explains that *From the Main Square* is designed in a way that ensures viewers miss something every time they turn their gaze.[18] However, what is missed may be inherently linked to the fundamental nature of VR experiences. The repeated process in which viewers focus on a particular scene, detect new changes happening around them, and shift their gaze accordingly may create a form of immersion that involves continuous attention shifts, rather than a deep, stationary focus. The director's interview suggests that the audience experience in VR may be a process that oscillates between attention and distraction.

Analysis of a focus group interview

For this research, nine VR experts, including a VR director, engineers, an animator, designers, a sound designer, and academic researchers, were invited to experience the piece. Following the experience, a group interview was conducted immediately and recorded in full. This interviews with the experts provide insights into perceptual experiences in VR. It is revealed that rather than maintaining a consistent state of immersion, audiences experience a different kind of immersion being in a perceptual state of continuous shift between attention and distraction as they interact with the virtual environment.

A: "Isn't the situation in the work intentionally chaotic? I thought perhaps the intention was to make the audience constantly turn their gaze, head, or body, creating a slight sense of dizziness. (...) Also the interaction itself have been directed more spectacularly to enhance this chaotic experience, making the audience feel the chaos even more vividly."

B: "(…) Constantly turning to follow the narrative was physically exhausting."

C: "That's why the vibration of the controller was a bit annoying. It kept interrupting me when I wanted to keep watching something, forcing me to shift my attention to something else."

D: "I also tried to ignore other signals and refused to look away when I really wanted to keep watching a particular scene."

Expert A pointed out that the strong visual and narrative elements in the work were deliberately designed to make the audience continuously shift their gaze, head, and body direction. This opinion on the design approach is closely related to B's experience, as the continuous shifting of gaze resulted in physical tiredness. Some interviewees also felt that the interactive structure of *From the Main Square* disrupted their attempts to focus on specific scenes. For instance, expert C mentioned that the controller vibrations (haptic signal) acted as a mechanism that forcibly redirected the audience's attention, which one found somewhat frustrating. Similarly, expert D stated that when he/she wanted to keep watching a particular scene, he/she deliberately ignored external signals and resisted distraction, suggesting that the VR environment might sometimes interfere with intentional immersion. In other words, even when the audience tries to focus on a single point, the narrative

progression in VR inherently prompts constant shifts in attention, ultimately creating an environment where the audience remains in a **state of continuous distraction.**

C: “Up until now, discussions around VR have often focused on questions like 'How do we guide the audience's gaze?' or 'How do we ensure viewers see what they’re supposed to see?' However, I realized that another approach could be just presenting everything to the audience at once—an environment where they can independently see, hear, and act according to their own will, creating their own unique experiences. This could be a valuable way of experiencing VR content.”

E: “I thought that perhaps VR inherently has a medium-specific characteristic that makes the immersion 'impossible.'”

The interview analysis suggests that the interactive design of *From the Main Square* actively shapes and regulates the viewer's cognitive flow, ensuring a continuous interplay between attention and distraction. Through this focus group interview, it becomes evident that while the traditional concept of immersion is often described as a state in which the audience focuses deeply on a single point and becomes fully absorbed, VR enables a different form of experience—one where immersion dynamically oscillates, integrating both attention and distraction.

The findings from the two analyses suggest that perceptual experience in VR is a graded process that fluctuates between different levels of attention. A person can be deeply engaged with the VR animation while still being distracted by visual, audial, haptic and interactive elements. The audience remains in a continuous state of shift between attention and distraction.

CONCLUSION

This study suggests that perceptual experience in VR is not a continuous, uninterrupted flow but rather a dynamic oscillation between attention and distraction. Drawing on Benjamin’s concept of reception in distraction in architecture and film, as well as Crary’s perspective that these states between attention and distraction exist on a continuum, this study provides a framework for rethinking how VR content can be designed to accommodate the audience’s perceptual shifts. The case study of *From the Main Square* illustrates that VR has the potential to offer a distinct form of immersion—one that integrates fluctuating attention and moments of distraction, rather than solely maximizing sustained focus.

Expanding the discourse on VR immersion, this study emphasizes the in-betweenness of attention and distraction as a critical aspect of perceptual experience in interactive VR art, particularly in works incorporating gaming elements. By shifting the focus beyond contemplative immersion, this perspective opens up new possibilities for artists, and developers in VR content creation and storytelling. Rather than adhering to conventional notions of immersion, embracing the interplay between attention and distraction allows for more dynamic and flexible engagement strategies. Ultimately, experimenting with diverse cognitive states and sensory interactions in VR has the potential to redefine how audiences perceive and engage with digital reality.

NOTES

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MUSEUM VIRTUAL TOURS AS SEQUENCES OF GAPS: THE RED LODGE MUSEUM

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INTRODUCTION

The webpage of the Red Lodge museum in Bristol invites us to 'look inside' the rooms of the building in a virtual tour. It is one of the panorama-based online tours with click-through hotspots that are widely used in museums, from the Science Museum in London and the Louvre to smaller venues like the Red Lodge. With varying number of source panoramas, functions, quality of the photos and cameras used, and platforms powering the usage of such tours (from Google Maps to separate platforms like Theasys web tool), these tours share the same principles of hotspot-to-hotspot movement, where each spot provides a 360 degree view of the venue.

As we 'turn our heads' around to examine the space reconstructed through panoramic photography, we see blurry areas above and below us, and click through the annotations layered on top of the exhibits in a space that 'has been owned, and lived in, by lots of different people from the end of the 1500s until it became a museum in the mid 1900s'.[1] From the very start of the tour this place is presented as a succession of its possessors and inhabitants. The arrows point towards the next room, skipping the staircase in a fade-in transition: apart from it hosting the portraits of John and Mary Henley, who inherited the Red Lodge around 1727, this isn't a 'noteworthy' place – at least that is how it is presented in the virtual tour.

It is easy to get disoriented in it: the tour is not a 3D model of the space, but a collection of photographs stitched together into a set of panoramas projected onto basic spheres. In transitions from one panorama to another, the interstitial spaces are lost – as not deserving a mention. Intrigued by these gaps and curious about what this place is apart from being a list of its owners, we set off on a physical tour – only to find out that the physical museum also presents a sequence of gaps and omissions, with them being weirdly enveloped by the 'truthfulness' and material richness of the physical encounters with the space. How can we approach these gaps, or 'failures' of the space – both digital and physical – in a way that would suggest different ways to present a historical location?

In our study, we attempt to approach such 'failures', as well as successes, of museum virtual tours from a different point of view: instead of arguing whether virtual tours are doing any justice to the physical experience, we would examine these 'failures' as invitations to rethink the temporal continuity in representing the history of a building. What has been happening between those disjointed moments in time when this space was passed on to the next owner? How can we make a museum experience continuous, not focussed on these possession-oriented moments in time? How can we capture continuity in the museum context, or alternatively – how can we bring the gaps to the forefront in representing history?

VIRTUAL TOURS, PANORAMAS, AND CONSUMERIST GAZE

The museum virtual tours that we are going to examine inherit some of the discourses surrounding panoramic images, which within the context of a museum bear distinctively imperialistic undertones: "The panorama's emergence was intertwined with the onslaught of capitalism, imperialism, urbanism, and, in the long run, the emerging era of the masses".[2] Placing the viewer into the center of the world, it created an illusion of limitless access to this world, and positioned this world as being made for the gaze of the audience. As Tim Barringer puts it, "the panorama provided an insistent, phantasmagorical juxtaposition of "here" and "there" – home and abroad; familiar and exotic; imperial center and periphery; metropole and province; civilization and its alleged others".[3]

Within the context of virtual museum tours, this interpretation of 'access' clashes with the well-intended call for accessibility. The decentralised access to the museum fragments the gaze, dispersing it over an array of private locations, which might seem like a productive step towards accessibility, but the technology itself lends its voyeuristic and consumerist undertones to the experience. Similar virtual tours are being heavily used in real estate marketing. They direct the gaze of the online audience onto a museum as onto an object of inspection in a visually similar way, and likens a museum to a sellable property, an asset, a commodity. And most of all, this commodity resembles a toy - but one which we cannot really play with, like a toy car without moving wheels. The virtual Red Lodge is a 'doll house' with very limited options for interaction – a digital unplayable toy. The promise of 'interactivity' is never fulfilled and replaced with clicking through descriptive texts and flat photos stretched over a basic sphere to appear having depth.

The complex, multilayered, often inconsistent space is flattened into a digital 'skin', a smooth uniform photographic surface stretched over a mathematically ideal, abstract sphere. The resulting digital object becomes a 'crystal ball' – a metaphor sending us back to the early days of consumerist viewing associated with mass television – that shows apparitions of spaces, all of them, no matter the differences, conveniently fitting into the magical digital sphere which brings these spaces right to one's device. This logic of convenience and immediate access is a part of what bell hooks called "the culture of capitalist frenzy and consumption that demands all desire must be satisfied immediately"[4]. Further in this work we will attempt to interrupt the smoothness of this consumption process, trouble and complicate it with subtle interventions that deliberately slow this process down and question the value of flawless immediacy.

INTERSTITIAL SPACES AND COLLAGE

How can we be more aware of the technological biases of museum virtual tours? One of its elements where this medium makes itself particularly evident is the transitional and interstitial spaces between the clickable 'hotspots'. These are organised as montaged cuts that omit the in-betweenness, the continuity of both the historical process and the experience of being in the physical location. The fade-in/fade-out scenes, as well as the blurry parts at the 'poles' of the panorama articulate the loss/lack of information, and also - the void of uncertainty in the place where the viewer is supposed to be.

Surprisingly, the physical space of the Red Lodge is also full of such abrupt cuts: each room represents a different time period, and the interstitial spaces between them (staircase, corridors), are hardly ever articulated, resulting in weird omissions, almost transitional 'non-places' within the place of a museum, to use Marc Auge's term[5]. The biggest interstitial space of the Red Lodge, the staircase (Fig. 1), is only explicitly articulated through two portraits of two of the owners.

Figure 1. Hall, Kimberly Ellen. The Red Lodge Staircase. September 30, 2024. Photograph.

The other elements of this space remain either decorative signs of the past, such as a landscape painting by an unknown artist, or anachronistic signs of 'museumness': museum guest book, booklets, fire extinguisher, red carpet with stair rods. Some of the parts of this space are unavailable – notably, both for the visitors and for the museum workers – such as the cellar and the attic. These spaces are annotated, but never shown – which also contributes to the feeling that the largest space of the Red Lodge is omitted as less noteworthy.

Many objects in the hall, such as the chests, remain silent, unmentioned 'props' imported from a variety of other locations (Fig. 2, 3). And if some can be regarded as 'less valuable' items from a corresponding time period or a similar building, others, like the publicly available image of James Millerd's map of Bristol from 1671, with its printouts being dispersed along the walls of Bristol pubs, clearly functions as a decorative prop, only vaguely related to the Red Lodge.

Figure 2. Kopalova, Ksenia. The Red Lodge Chest. September 30, 2024. Photograph.

Figure 3. Kopalova, Ksenia. The Red Lodge Cabinet. September 30, 2024. Photograph.

The extremity of this collaged theme park-like nature of the Red Lodge is best illustrated by the room with a well, where the wooden panelling is 'imported' from a neighbouring building, creating a visible gap of a bare wall between the ceiling with unpolished wooden trusses and more refined wooden panelling (Fig. 4). The gap between the panelling and the ceiling again resembles a 'skin', a mask, like the flattened photographic file stretched onto a digital sphere of the panorama, revealing surprising similarities between the virtual tour and the actual physical space.

Figure 4. Kopalova, Ksenia. The 'Collaged Well Room' at the Red Lodge. September 30, 2024. Photograph.

(DIS)CONTINUITY AND DELIBERATE FAILURE

Like many historical museums, the Red Lodge is an attempt to construct a space of 'what it might have looked like', a speculation using collage and montage as its primary instruments. There is something self-contradictory about this intention: the physicality of the space aims to present it as continuous, just like the digital blurry approximations do – both calling to imagine the missing bits. But the real museum experience is quite a bumpy, discontinuous journey where the gaps are unintentional. What if these 'bumps' and gaps were made deliberate? Or – what if the continuity of the museum experience did not rely on the continuity of facts, which it is aiming to reconstruct?

Paul Virilho and Sylvère Lotringer treat failure as "active production of the 'accidental potential' in any product".[6] For us, the discontinuity of the museum's virtual and physical spaces creates potential to engage with it that a really flawless continuous experience would not invite. In discussing failure's potential, Jack Halberstam goes on further to point out that "failure is not a bad place to start for a critique of both capitalism and heteronormativity" [7], and argues that failure can be a conscious radical artistic practice aimed at disrupting capitalist modes of existence. With this in mind, we see active, deliberate failure as a strategy to question the consumerist modes of spectatorship and usership embedded into panoramic virtual tours. Stressing the gaps and discontinuities of the museum's virtual tours can be a way to be conscious about their technologically embedded biases. As bell hooks suggested, "we may learn from spaces of silence as well as spaces of speech",[8] and we suggest that the 'language' used by the museum's virtual tour is that where silences, gaps, and failures are the most productive spaces of discovery.

In a digital experience, flaws and interruptions are normally seen as unwanted, but also – as revealing the constructive elements of this digital experience. Looking into noise and glitch can be ways of being conscious about the digital medium used to convey the experience. Writing on the nature of analogue noise, Horst Bredekamp notes: "Ideally, the medium used to render the object visible is present only as an absence; image noise occurs when it becomes visible".[9] Digital glitches and mistakes make the viewer/user aware of the functioning of a given digital environment.

We tried to reflect upon the workings of a technology used to 'stitch together' discontinuous moments in history and make them intentionally, visibly patchy, so that the gaps and omissions in the history making process are technologically admitted, rather than disguised. Thus, we created a version of the

Red Lodge virtual tour,[10] where glitches are deliberately used to stress the unknowns, the discontinuous, the unmentioned.

In this version of the tour, the locked cellar is glitching, emphasising the impossibility of entering the space: it is impossible to enter it because digitally this is a surface impossible to navigate and have a sense of depth within, and physically this space is locked even for the museum workers. The portraits of the owners are omitted through a Google panoramas-like glitch, a digital 'black hole', revealing the stitched nature of a fabricated continuity, disregarding the possession-focussed elements of the history of the location, and being deliberate about its unknowns, such as the locked attic, which the navigational arrow now points towards.

(IN)ACCESSIBILITY AND PARTICIPATORY ARCHIVE-MAKING

Apart from stressing the mistake we suggest that one of the strategies to question the technological biases of the panoramic virtual tours would be including the voices of the visitors into making them, as records of the lived experience of the place. Including records of affective and 'insignificant' experiences could be a way to make this virtual tour a 'living archive': an archive "not designed for long-term storage and memory, but for reproduction, for endless circulation between different levels, people, networks and locations".[11] What if it captured affective encounters with the museum space? What unofficial, insignificant, fleeting, and even 'silly' experiences populate this place? What kind of Red Lodge would we see, if we were to rethink it as a 'silly archive', to use Halberstam's phrase[12]?

The squeaky floors, the dust on the windowsills and withering plants in the garden, the smell of old wood, the eeriness of the repetitive recording playing every 10 minutes to recreate the sound of a muted harpsichord with a "Please do not touch" sign on it are all continuous affective experiences. They do belong to the present moment of connection with this collaged space, but what if they were brought to the forefront, rather than being by-products of the visit?

In the reimagined virtual tour we made we tried to highlight the richness of sensory experiences in the physical museum: the smells of the old wood, the squeaky floors, the echoing sounds of footsteps. We looked at the experiences of other people in the guestbook, observed the textures, felt the sounds and smells, collected the ambiguous names of the flowers from the museum's garden (Fig.5), and tried to highlight those, intertwining it with our own 'garden' of experiences of this space (Fig. 6 and in the virtual tour[13]).

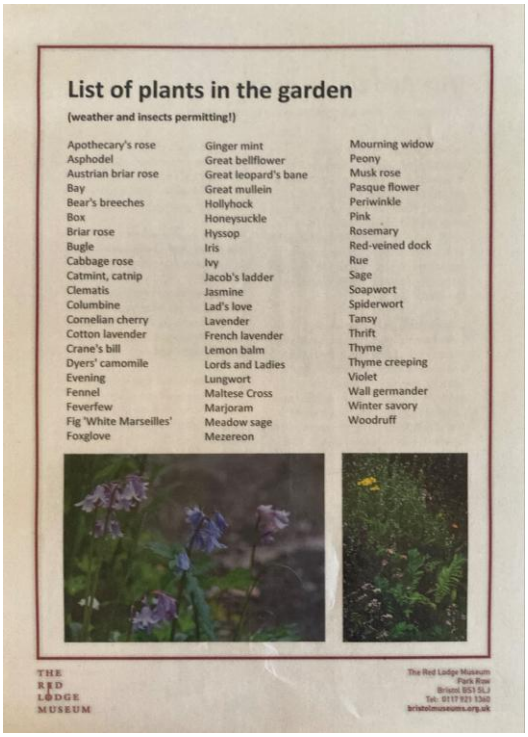

Figure 5. Hall, Kimberly Ellen. Sketches made after the visit to the Red Lodge. October 10, 2024. Ink drawings.

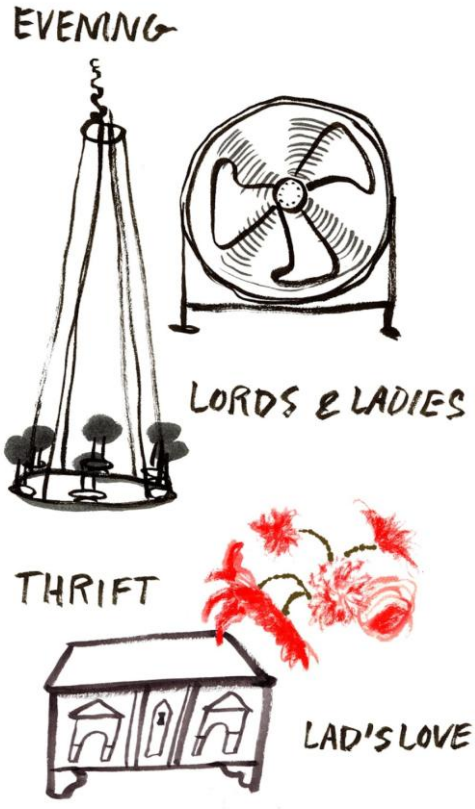

Figure 6. Hall, Kimberly Ellen. The list of plants in the garden at the Red Lodge. September 30, 2024. Photograph.

The ornate ceiling looks like a marshmallow and a mattress. The wooden panelling is almost glitch-like, obsessively repetitive. These sensations – especially if coming from multiple people of different backgrounds, if recorded and updated, can form a collective living archive that could recalibrate the focus of the technology. Whilst acknowledging its histories, it can be used as a way to invite engagement with its weird mixed (im)materiality, challenging the ways virtual tours present the idea of 'access' to archival material.

INTERRUPTING OPERATIONAL IMAGES WITH DRAWING

Finally, we have tried to interrupt the original panoramic photos with our own drawings. We deliberately juxtaposed the sketchy, quick drawings made with traditional materials to the technological smoothness of photography. Exposed imperfection, immediacy, and subjectivity associated with a trace of the hand left with traditional materials was what we felt was in sharp contrast to the qualities of the photographic panoramas in the tour. As Gemma Anderson outlines it, "Drawings not only represent the subject they describe but also the embodied human experience of the seeing process itself".[14] In this respect, including the drawings into the panoramic tour was our way to manifest individual 'insignificant' presence – a way to locate the body within a digitally constructed 'flawless' continuity that feels somewhat static in its commodified state.

The diary-like quality of observations, handwritten and scattered around the digital rooms, are also an attempt to personalise the space, to encounter it on equal terms, to locate the viewer that is otherwise replaced by a blurry void at the poles of the panorama. In our tour, we are trying to emphasise our own presence: through the trace of a hand in the sketchiness of the drawings, noted sounds, and literal depictions of our own bodies in this space, such as a sketch of a leg in a shoe stepping on the squeaky floor.

Interestingly, the source panoramic images are hardly ever viewed separately, as self-sufficient images. Even though they are technically accessible and possible to edit, the way they are used within Theasys web tool, the virtual tour making platform used by the Red Lodge museum, does not suggest such modifications: these panoramas are clearly supposed to move almost instantly from a camera to the virtual tour making app. In other words, they resemble what Harun Farocki and Jussi Parikka call 'operational images': visuals participating in machine-to-machine communication, visuals "drawn from machine-vision systems of perception, embodied and embedded in autonomous or remote systems, working through an artificial environmental relation where the image is a crucial part of movement and guidance".[15]

In our version of the tour, we wanted to interrupt this guidance negotiated between the machines with evidence of embodied presence, flawed and imperfect, inconsistent and patchy, personal, 'unimportant' and ultimately 'silly', but purposefully so. The machine-to-machine procedure, if uninterrupted, creates an opaque technological solid block that is difficult to question, and we tried to make an initial step at unpacking it.

CONCLUSION

Technologically, the virtual tours seem to amplify the biases already present in the museum histories, but what if these technologies were used more critically and transparently, so that these biases are exposed? We tried to interfere into the fabric of panoramic virtual tours and make the collaged, often incoherent and patchy nature of the museum experience more prominent, mixing it with 'less significant' ephemeral personal experiences and observations. If we invite more voices into creating such a virtual tour, maybe it can become more of a 'living archive', rather than a static one.

This proposal of a 'silly archive' can be a way to reimagine the ways virtual tours are used in the museum context and be transparent about the biases associated with technology. Bristol Museums aim

"to have open, honest conversations about the complex histories behind our objects, archives and spaces",[16] and maybe this work could be continued in the online spaces as well.

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WELCOME TO UNCANNY VALLEY: INTERRELATIONS AND IMAGE HYBRIDS BETWEEN PHOTOGRAPHY AND VIDEOGAMES

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Photography has over two centuries experienced meteoric rise from a pastime for wealthy and aristocratic inventors, scientists and artisans to one of the most ubiquitous forms of visual imagery.[1] The rapid development and popularisation of digital imaging technologies over the past two decades has furthered the medium's entrenchment in all facets of modern society and culture. As John Berger notes, photography has become a habitual, unexamined and quintessential part of modern perception and ways of looking.[2] As a civilisation accustomed to thinking in images, photography is now a family of styles and subjects with aesthetic and technical qualities deeply ingrained in modern visual language. Likewise, the indexical qualities of photographic realism have become naturalised in modern representation.[3] The emergence of new technologies, including text-prompted image generative Artificial Intelligence, show how essential photographic media and images are today. Nowhere is this more relevant than at the intersection between contemporary video-gaming and photography.

Video-game developers have from mid-2010s onwards released games with tools called Photo Modes. These 'Modes' are a type of extra-diegetic image-making mode that allow players to make or take in-game photographs. The uses and functions of these vary between creative expression and documentation but are shaped by the players' experiences of game worlds.[4] Photo Modes are found in a variety of games, including *Assassin's Creed Origins*, *Ghost of Tsushima* and *Cyberpunk 2077*.[5] Combined with social media and image-sharing platforms such as Instagram, Reddit and Flickr, a new photographic genre and practice of 'in-game photography' or 'virtual photography' has flourished. Yet Photo Modes are only one way that videogames emulate photographies to enhance a sense of reality and deepen player immersion. Other games use in-game photographic equipment and objects, including photographs, albums and fully simulated darkrooms as inter-diegetic gameplay mechanics and narrative devices, as seen in *Firewatch*, *Red Dead Redemption 2* and *Martha is Dead*.[6]

So reluctant are modern viewers and image-makers to abandon photographic aesthetics and techniques that this practice only increases in popularity. While no definitive lists exist, one source has compiled a growing catalogue of 444 videogames that include either of the aforementioned forms of in-game photography.[7] This development reveals firstly the fluidity and ambiguity of photographic realism as a visual language and its applicability and uses beyond photography. Secondly, intention and context matters. These in-game photographs are intentionally made to be viewed and conceived as photographs, albeit hybrid.[8] By harnessing the multiplicity of technical and stylistic qualities of

film photography and photographic realism, including lens flare, glare, film grain, depth of field and filters along with photographic genre and subjects, in-game photography extends the photographic image and its representational power into the virtual.[9] Regardless of technical execution, each remediation allows players and photographers, amateurs and professionals alike, to explore increasingly graphically complex, aesthetically interesting and deeply immersive and realistic worlds using familiar tools and techniques.[10]

Can technical and cultural remediations of photographs in video games illuminate our interactions with physical and virtual spaces? Can interactions with virtual environments through photographies help us reflect on our engagement with the medium? My interest in these questions stems from playing *The Witcher 3: The Wild Hunt* and frequently hiking in 2015.[11] After returning home from a long hike, I started the game and was immediately captivated and transported into the game world, noticing how the game's blustery, rain-soaked forest mirrored my earlier physical surroundings. Upon its release, *The Witcher 3* was lauded for its immersive, photo-realistic environments and their authentic, accurate rendering of virtual space, drawing from a combination of Slavic, Celtic and Scandinavian references.[12] Locations such as the port city Novigrod is modelled on periods of Polish architecture and Skellige, an island nation whose landscape mirrors mountainous, coniferous forests found throughout the Nordic countries. Cumulatively, the effect is, as Rob Dwair notes, geologically convincing and naturally dense with everything down to the smallest detail of design giving the landscape an extra quality, making them believable places.[13] Among these details are countless footpaths intersecting and connecting different areas between places. In game, as in physical reality, these paths provide access while also emulating the experience of walking paths physically. Like their physical counterparts, virtual paths are covered by nature's debris and littered with branches lying on roots and undergrowth that crunch underfoot. Each footpath leads to new locations and stories, while providing a familiar way for immersing and experiencing a game world. This occurs not just visually, but also through sound and motion. As you walk any path in *The Witcher 3*, a breeze can rush through, causing treetops to sway along with the sound of the wind, rustling leaves and creaking trunks. Local wildlife can be seen and heard moving through the environment. Each details adds a layer of believability, encouraging you to explore and immerse yourself further.[14]

Fast-paced, open-world sandbox games like *The Witcher 3*, which require players to complete missions or quests, reward exploration with new events, interactions and treasures. Other games, referred to as 'walking simulators', use walking as a storytelling device in combination with embedded narrative sequences and environmental storytelling.[15] *Everybody's Gone to the Rapture* evokes rural England during the 1980s using specific spatial design and landscape features idiosyncratic to this place and period.[16] [17] The stile is one such feature, allowing people travelling by foot access to public land and between cultivated and uncultivated lands through a combination of steps, ledges and narrow gaps. This is due to the Rights of Way, a public right codifying traditional non-motorised outdoor access on land and water, requiring landowners to provide accessibility with stiles alongside footpaths and signage.[18] Stiles are today relics of a by-gone era as they are replaced by conventional gates or removed altogether. Incorporating stiles in a late twentieth-century English pastoral landscape, alongside other period-appropriate details, enhances the virtual space's authenticity and believability. The space becomes less uncanny and alien and more familiar, a comforting place where you have time to appreciate the minutiae and ordinariness of human and non-human life. As Cameron Kunzelman notes, 'The willingness to strip a player down to their experience of a space, and to ask them to sit with how they exist in that digital zone for a few moments, is a radical pause. These games ask players to look at the world not as a set of challenges, and instead as a thing to be explored and appreciated for its own sake. They ask one to do less and experience more.'[19]

Following my experiences of virtual and physical spaces, I began an artistic experimentation to explore boundaries and intersections between photographies and videogames and question the dominant understanding of photographs as transparent and accurate visual records of reality. The project, *Virtual Lands*, intentionally appropriates and remediates formal and stylistic qualities of photo-realistic videogames using photographic technologies and techniques. My aim is creating hybrid photographs that look like in-game photographs or screenshots using analogue and digital photographic methods.

The practice of landscape photography is rooted in histories, traditions and aesthetic conventions originating from the fifteenth-century when landscape was primarily used to signify wealth or as beautifying scenery. Only in the eighteenth-century was landscape ushered in as an aesthetic category and subject with the introduction of landscape as a 'contemplative view'[20] Contemporary artists have more recently interrogated landscape as a construct, interactive place and experiential site that allow for engaging with economic, cultural and historical values using photographies as their medium. One key notion that emerges in analysing contemporary landscape practices is the importance of walking. Walking remains the primary method for artists and photographers working outdoors to reach their subjects, reflecting a centuries-old practice where artists walk in-situ while sketching subjects. Nineteenth-century landscape painters Caspar David Friedrich and Werner Holmberg would later combine these sketches in-studio into composite landscape paintings.[21] Their paintings are uncanny compositions that fluctuate between visual coherence and spatial confusion, largely due to how the paintings incorporate different compositional elements, spatial details and landscape features into three-dimension spaces that are unnervingly familiar yet foreign.[22] Later generations, including Richard Long, have made the walk itself the conceptual basis, creative methodology and subject of their artistic practice, creating photographs, sculptures and on-site installations that document the passage of time and movement through space to create ephemeral places and landscapes.[23]

While walking is essential for practical and recreational purposes, as part of an artistic image-making practice it transforms from mundane necessity into a reflective and performative artform.[24] In this mode, walking requires awareness and sensitivity towards its context and site. Walking purposefully is a way to engage and interact with the world. It becomes a means for exposing oneself to changing perceptions and experiences and acquiring an expanded awareness of our surroundings. Through such experiences and deeper understanding of places, whether physical or virtual, we acquire better understanding of our position in the world and how we relate to others.[25] When combined with photography, walking becomes a photographic reality, enabling walker-photographers to observe, perceive and experience everyday aspects and mundane details with heightened awareness.[26] Walking is thus more than mere means of traversal. Applying rules and parameters, as artists do, this approach becomes a method for interrogating cultural practices and conventions and a means to intentionally slow down and contemplate how we construct realities and their representations.

Preliminary research suggests similar phenomena occurring in gaming. A 2019 study shows that players could correctly identify several species of North American flora and fauna after playing *Red Dead Redemption 2* (*RDR2*).[27] This requires players spending extended periods of time learning the game's mechanics, from weather patterns and binoculars to terrain navigation and behaviours of non-playable characters. While the participant pool was limited, these findings suggest that player immersion in virtual environments can provide a learning experience and transferable skills, potentially provoking a greater curiosity, understanding and appreciation for the player's physical environment. Players have time, space, access and safety to observe wildlife and collect specimens while learning physical traits and characteristic behaviours of 'real' world equivalents. *RDR2* encourages players to observe and experience the environment, even providing a Kodak Brownie and a robust Photo Mode with which to photograph in-game. The game shows how technical and cultural

practices pf photographies in videogames are part of a greater network that gives meaning, significance and relevance not only to photographic media and images but also to our experiences and interactions with physical and virtual realities.

Ed Ruscha explores similar issues in his photobooks, which examine the changing conditions of Los Angeles during a period of rapid urban development and expansion. Instead of walking or horseback-riding as in *RDR2*, Ruscha utilises cars as a fitting method of transportation to examine changing perceptions and conceptions of landscape using a performative and typological approach.[28] This process results in sequential photographs, neutral, distanced and disembodied in appearance. However, each sequence gradually reveals inexorable similarities between mundane places serving similar functions, from gasoline stations to entire streets.[29] This repetition also reveals subtle differences and idiosyncratic detail. Viewing Ruscha's books require a similar investiture of time and effort as tracking a deer in *RDR2*, which strips away any notion of a detached or disinterested observer, instead revealing an embodied and personal engagement with place.

Developing *Virtual Lands* required establishing several rules, including identifying a subject shared by all images. I quickly determined that footpaths are a common denominator between videogames, landscape photography and walking. Paradoxical constructs by their nature, footpaths are utterly mundane and seldom receive due attention for their critical function. Constructed entirely for pedestrian thoroughfare, footpaths provide access while also guiding and limiting foot or bicycle traffic. As most vernacular architecture, footpaths are often overlooked by their many users, as they are intentionally designed to seem as naturally occurring as possible. They are intentionally designed and constructed to influence how people behave and move, shaping our perceptions and experiences of natural and cultural landscapes.[30] Footpaths are also part of greater contexts in landscapes.

An essential aspect of the project has been acknowledging environmental contexts. All photographs used in the project's current iterations were made in nature reserves and protected wildlife areas in Scotland and Finland. These are increasingly rare yet vital ecosystems. Culturally, Finnish and Scottish landscapes are idealised and mythologised as true untouched wilderness and form a vital part of each country's national identity.[31] The notion of unaltered wilderness is however a misconception. Finland and Scotland have some of the largest forests and wilderness areas in Europe, yet they are increasingly difficult to protect from exploitation and urban expansion.[32] Most ancient boreal forests and rainforests have long been deforested with few remnants. And yet, these are places where people fervently love and appreciate nature, despite limited daily contact and increased physical and perceptual distance.[33]

Each virtual land or hybrid photograph remediates graphical qualities of video games, including texture mapping, 3D modelling, artifacting and ambient occlusion through digital compositing. These composites are made by combining seven bracketed exposures in Adobe Photoshop to create a single High-Dynamic-Range image.[34] This image is subsequently post-processed using layers of Gaussian Blur and colour grading to achieve the effect of game engines gradually rendering objects and geographies. The aim is to play with viewer's expectations of the photographic image and how it functions visually and contextually.

Artists such as Thomas Ruff play with such notions using found imagery and photographic archives to critique aesthetic conventions, genre and motif by reframing material and formal characteristics. Ruff's works ask us to reconsider existential questions about the presentation, mobility and meaning of photographies.[35] His work embodies their inherited discourses and histories, with the photographic medium his subject rather than what is pictured.[36] In a similar vein, presenting *Virtual Lands* has intentionally explored the project's hybrid materiality utilising different materials and methods of presentation. To date, the project has been exhibited as physical prints (both pigment and photographic), screen-based digital art, large-scale installation and a photobook. Blending game art

and conceptual photography, the hybrid landscapes demonstrate how analogue media and art co-exist with new media through processes of emulation, remediation and incorporation. This appropriation of existing tools and conventions for new purposes alongside the reinterpretation of old and new media highlight how photography is not obsolete but re-engaged and immersed into new realities.

The remediation of photographies in videogames refute many fears expressed by critics sceptical of the effects of digital imaging technologies on photographies. W.J.T. Mitchell argues that digital technologies would 'relentlessly destabilise old photographic orthodoxy and disrupt familiar practices of image production and exchange.'[37] Mitchell is not alone, with Fred Ritchin's moderate approach foreseeing a rupture from photography-as-before.[38] One major point of contention is the ease with which photographs can be manipulated using such technologies. These fears, however, stem from a generalisation of photography's plurality and a monolithic understanding of the medium. Geoffrey Batchen argues that the histories of photography is a history of intentional interventions and purposeful alterations of photographs and the realities they represent.[39] Before a viewer's perspective and interpretation shapes a photograph, the image is already formed by the subjective and creative decisions on an image-maker. Artists, such as Jeff Wall, use digital composition not to undermine any veracity, instead confronting viewers with the intangible influence that art and photographic histories and discourses have in shaping our perceptions through combinations of materialities and visual languages.[40]

Pinning fears on perceived ontological differences, as Mitchell's theory does, sees photography as a unified monolith and ignores contradictions, complexities and multiplicity. In reality and practice, distinctions between analogue and digital do not matter.[41] Digital photographs are like their analogue counterparts, even when methods of production and dissemination differ technologically. Likewise, digital technologies have not caused obsolescence but rather the development of immersive and interactive technologies allow us to recover and re-discover photographs long forgotten. Rather than a poverty, there is an abundance of photographs, each with specific functions, uses and contexts.[42] Accepting this, however, requires a willingness and ability to look beyond the medium specificity of photographic images into messy interwoven realities. Doing so reveals what Martin Lister calls the 'economic and cultural investiture that modern cultures have in photography and their meaning, significance, intention and context.'[43] I argue that digital images take us beyond the conventions of 'normal' and straight photography. Rather than faking reality, computer graphics attempt to fake photographic realism. They succeed doing so because we have accepted photographic images as reality. Hybrid photographs, such as in-game photographs, are not inferior representations of reality, but realistic representations of hybrid ones.

Virtual Lands is an ongoing project in its third iteration. As it develops, I aim to produce more qualitative research, including in-depth viewer interviews. To date, I have received promising informal responses. The intentional ambiguity causes different reactions depending on viewers' familiarity with photography and videogames. Some experience confusion, others comprehension and some are curious of real-world sites. My work has thus far provided some crucial observations. Firstly, traditional film photography remains vital among artists and consumers. Kodak and Fuji have re-started production of film-stock and Europe's largest secondhand retailer of analogue photographic equipment Kamerastore.fi received a one-million-euro funding.[44] There is, however, pressing need with the co-existence and intermixing of different media to help people at all levels of society to develop better visual and media literacy and critical thinking skills, especially with regard to art, media and photography. We can no longer afford any naivety when it comes to the intentions and purposes of images. Secondly, our physical and virtual environments require care and attentiveness. Both are highly vulnerable to negligence and corporate greed and even though we live increasingly virtual lives, we remain physical beings with physical presences. In southern Finland, I have seen old

coniferous taiga forests ceded to younger leafy trees due to climate change. Likewise in Scotland, ancient forests crucial for biodiversity are far and few in between, even with reforestation and re-wilding projects. These are events no single individual can stop, yet even caring can make a difference. So, I urge you, if you can, to grab a camera, go for a walk outdoors or in a videogame and enjoy the sights, sounds and scents of your surroundings.

NOTES

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MUSIC AND DANCE: STORYTELLERS OF EROSION, REPAIR, PLACE, AND PEOPLE

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INTRODUCTION

The iconic American modern dance choreographer Martha Graham once said, “Dance is the expression of man—the landscape of his soul,”[1] while the equally renowned American composer Leonard Bernstein stated, “Music...can name the unnamable and communicate the unknowable.”[2] Live performance possesses a profound communicative power, capable of telling stories of people, place, and history—transforming not only audiences and witnesses but also the performers, who serve as storytellers themselves. In this writing, we present a model based on experience that demonstrates the transformative impact of combining music and dance. Specifically, we explore how this collaboration can help performers—especially university students—process trauma related to time and place, while also uncovering cultural and historical connections through their art.

For millennia, dance and music have joined together as powerful forms of communication beyond spoken language to transmit stories, rituals, and cultural knowledge across generations. One of many relevant examples is the kapa haka, a ceremonial dance of the Māori people of New Zealand. Kapa haka roughly translates to "dance accompanied by song" in Māori—it is a dynamic vocalized percussive dance that conveys community values, emotions, and shared histories.[3] Similarly, the Second Line dance of New Orleans is a vibrant tradition that blends music and movement to tell stories deeply rooted in the city’s cultural identity. Originating from African and Afro-Caribbean traditions, the Second Line is most often associated with parades and funerals, where rhythm, movement, and music converge to express complex themes of celebration, mourning, resistance, and personal expression.[4]

Historical Context

In the western classical music tradition, opera prominently merges music, dance, and theatre to convey narrative. Works like Giuseppe Verdi’s *La Traviata*, with its tragic story of Violetta and Alfredo, uses music to amplify the emotional and narrative depth of the plot, allowing the audience to experience the characters' joys and sorrows more profoundly.[5] Similarly, jazz music, a distinctly American art form, emphasizes individual expression and often conveys stories without words. John Coltrane’s *A Love Supreme*, for example, is a spiritual suite that chronicles Coltrane’s personal journey through faith, redemption, and love.[6] The music itself becomes the narrative, with shifting rhythms, melodies, and harmonies reflecting an arc of transcendence and spiritual awakening.

Similarly, classical ballets of the western cannon have historically offered narrative experiences to its audiences via dance choreography set to impassioned musical scores. Ballets such as *Swan Lake* and

The Nutcracker, both scored by Pyotr Ilyich Tchaikovsky and each reimagined over time by numerous choreographers, rely on the expressive power of dance and to tell a story, with movement serving as the primary language of emotion and plot.[7] The dancers' gestures, postures, and choreography communicate complex narratives of love, betrayal, and redemption, much like opera uses vocal performance and orchestration to heighten emotional stakes. In a comparable way, American modern and Broadway choreographer Donald McKayle's 1972 dance suite *Songs of the Disinherited* shares a thematic connection with Coltrane's *A Love Supreme* in its journey from struggle to spiritual emancipation. Set against an array of American gospel hymnals and original scores by Richie Havens and Roberta Flack, McKayle's choreography weaves together the experiences of marginalized individuals, tracing their emotional and physical struggles while offering a path toward resilience and empowerment. Just as Coltrane's music charts a course through personal and spiritual transformation, McKayle's dance work uses movement to tell a story of overcoming adversity and ultimately finding freedom and grace. Both works—through their respective mediums—offer deeply transformative experiences grounded in universal themes of struggle, transcendence, and liberation.[8]

Contemporary western music and dance, responding to and expanding upon these narrative underpinnings, often open up a broader spectrum of storytelling expression ranging from the literal to the abstract. In contemporary modern concert dance, for instance, choreographers may choose to tell a chronological story through movement, while others might explore more abstract expressions of emotion, mood, or idea. Similarly, contemporary music might blend dissonance and silence with melody or experiment with electronic soundscapes, evoking feelings or atmospheres without relying on a traditional narrative structure. Whether through structured narratives or open-ended abstraction, contemporary music and dance continue to serve as powerful vehicles for emotional expression and storytelling.

To date, several academic articles and studies explore dance as a narrative, though not always in collaboration with live music performers. In "Choreographing Living Experience," Karen Eli and Rosie Kay use dance to tell stories of illness recovery, highlighting how movement can express personal experiences and emotions related to healing.[9] Similarly, Caitlin Kelly's "Dancing at the Crossroads of Body and Mind: The Therapeutic Use of Irish Set Dancing as Storytelling for the Elderly" introduces Dance/Movement Therapy (DMT) as a strengths-based therapeutic intervention. DMT focuses on the mind-body connection and its crucial role in behavior, expression, cognition, and communication, particularly among elderly populations. This approach underscores how dance, as a physical and emotional expression, can offer profound ways to tell stories of resilience, memory, and personal experience.[10]

A compelling performance-focused example of dance as a narrative is *Embodied Storytelling: Using Narrative as a Vehicle for Collaborative Choreographic Practice*—a case study of Flatfoot Dance Company's 2016 *Homeland Trilogy*. This study delves into the comparison between literary narratives and embodied movement, examining how physical expression through dance can mirror and expand on the themes and emotions conveyed in written stories. Furthermore, the work explores how the body and movement can articulate complex narratives in ways that literature and spoken word cannot, providing an embodied counterpart to the written or spoken word. Such examples reflect how dance, even in isolation or without live music, can significantly engage with narrative storytelling, weaving a connection between mind, body, and the world of words and ideas.[11]

While these particular studies focus on the therapeutic and narrative aspects of dance, the authors hint at the broader potential for collaboration between dance and music in storytelling. In works like the *Homeland Trilogy*, where movement and narrative are intertwined, one can imagine how the addition of live music could further enrich the storytelling experience, infusing it with additional emotional

depth and complexity. Ultimately, whether through dance alone or in combination with music, these explorations suggest that the synergy of movement and sound holds immense potential for deepening our understanding and experience of storytelling across various art forms.

OUR PROJECT

Our case is a screendance, also known as a dance for film, entitled *Embers & Ash*, created at Southern Utah University in 2021. *Embers & Ash* was a collaborative effort between faculty and students in the music and dance programs.[12] Created and executed during the COVID-19 pandemic, this was a time with many restrictions in place for schools and performance venues. For the nineteen students involved in the project, it was a time still steeped in constraint with many limitations of place; these were the students that missed their senior proms, high school graduations, and started college during the pandemic.

Our collaboration began with the primary goal to foster meaningful emotional and visceral connection for these students, as well as identify creative strategies within the project for each of them to process their experience of the pandemic. Additionally, we provided opportunities for the students to engage with relevant stories and histories that related to what they were presently experiencing. A foundational inspiration came from Terry Tempest Williams's essay anthology entitled *Erosion: Essays of Undoing*, which addresses themes of deteriorated landscapes, values, and civilizations. A quote from Chuck Palahniuk, shared inside of Williams' book, kept grounding the design of the work: "*All souls come here to rub the soft edges off each other. This isn't suffering. It's erosion."*[13] Responding to Palahniuk, Williams stated in an interview with Living on Earth in 2020:

When power is denied and oppresses others… something new emerges. This is the essence of erosion and evolution in human time. In geologic time, transformation can be slow and corrosive, or catastrophic and quick. It may be a cataclysmic moment or it may happen incrementally over time. Deep change requires both. And it is not without its ruptures. It can be associated with devastation or determination. It can also be beautiful. Weathering agents are among us. This is a time of exposure. I dwell in Utah. I am witnessing change. Wind does wear down stone." I think it's that idea, that we are both evolving and eroding together.[14]

Williams' non-fiction text laid the groundwork for our discussions early in the creative process about the collective trauma caused by pandemic lockdowns, social isolation, and societal breakdown. On the flip side, subsequent conversations explored hopeful evidence of renewal made possible by pandemic restrictions, such as wildlife thriving in urban spaces and reduced pollution from decreased commuting.

Drawing from these initial conversations, the creative design elements of our project started to take form, as we sought to address the following questions: What art could we make to convey and overcome our collective feelings of the time?; could dance and music effectively collaborate to express these personal stories as a collective entity?; and, could the students gain a deeper connection to other stories, both current and historical, to cultivate deeper learning and empathy?

The project outcomes suggested that music and movement indeed provided an effective tool for self-discovery and authentic self-expression for our students. Our project also reinforced the notion that storytelling does not need to follow a linear or traditional narrative to hold deep meaning for performers and audiences. In fact, the abstract forms of contemporary dance and music expanded the possibilities for how we could experience and interpret stories, offering multiple ways to engage with the work on both a visceral and intellectual level.

Another outcome for the students involved learning to control and shape their emotions while actively conveying messages to the world through their physicality. They learned to take ownership of the stories happening to them while drawing deeper personal connections to other stories about places and

peoples. Ultimately, the project helped students reclaim ownership of their experiences, giving them a sense of agency and empowerment, which in turn became a tool for healing and self-discovery.

The Collaborative Process

The Music

In the selection process for the music, it was crucial to find compositions that reflected some of the themes that the project was addressing—loss, erosion, isolation, anger, fear, and confusion, among others. With such a vast spectrum of emotions to cover, it became clear that the project needed two distinct pieces: a quiet, intimate score, followed by a bombastic, collective score. In addition, the project aimed to expose students to historical narratives and current events, helping them draw connections to their own experiences. We carefully considered rhythm and tempo to enhance storytelling musically—fast percussive rhythms evoked excitement or urgency, while a slow, lyrical tempo suggested melancholy or contemplation—making these elements essential in selecting compositions.

For the first score, we chose *Falling Embers* by Ella Macans for its intimacy and introspective quality. This piece provided an opportunity for the students to learn about the devastation of wildfires, specifically the Sydney fires of 2020, and that event's impact on the landscape. Ella speaks of her work,

Falling Embers was originally composed as a meditation for peace and relief from the fires that raged across the Australian landscape in the summer of 2020. Tracing a glowing particle suspended above desolate land where all has been lost and destroyed, the piece explores the idea of the last moments of something—the final glow before life burns out. As the music evolved, Falling Embers came to embody and represent something deeply personal and deeply tender taking place at the time of composing the work: The final moments—the final glow—of a very special relationship.[15]

For the second composition, we chose *Silent Canyons* by Nathan Daughtrey. Set for percussion ensemble, this work features vigorous rhythmic passages, high energy drumming, and complex melodic and harmonic interplay, which allowed the choreography to play with anger, fear, and confusion effectively. The inclusion of *Silent Canyons*, inspired by the story of the Ancestral Pueblo people who once inhabited the Four Corners region of the Southwestern United States, provided an opportunity for the students to learn about the Pueblos' stories, disappearance, and legacy. The composer speaks of the piece in this way:

It seeks to follow this evolution of a civilization being built in these previously uninhabited caves, the conflicts that arose with other peoples, the disappearance of the people, and returning to the emptiness of the canyons.[16]

Performed in tandem, the two pieces allowed the students to traverse a full emotional spectrum, forging connections between past and present narratives while enriching their experience and deepening their awareness.

Figure 1. Embers & Ash performance image by Asher Swan.

The Dance

The choreography for *Embers & Ash* evolved through a five-week rehearsal process, beginning with the emotional inspiration from Chuck Palahniuk's quote on human connection. We developed a foundational movement phrase based on themes of erosion and suffering, incorporating percussive tapping and striking gestures. Dancers first learned this phrase, then created individualized solos based on the same themes, allowing them to infuse personal meaning. In the next phase, duets explored movement dynamics, reflecting themes of fragmentation and regeneration. Finally, the choreographer assembled the solos, duets, and original movement into a cohesive piece, maintaining an open dialogue with the dancers to ensure the final work reflected their collective emotional and creative experience.

The Collaboration

Ultimately, in the finished screendance of *Embers & Ash*, the dancers and musicians interact with one another, the space, and the musical score to weave a deeply layered story of loss, transformation, and the enduring power of collective human experience. The dance begins with low, grounded movements that echo the tender vibraphone solo in *Falling Embers* by Ella Macans. The choreography evokes the emotional weight of isolation, akin to being confined within a box. As the dancers rise from the floor, their movements respond to the intensifying melody and gradually become lighter and more expansive, signaling a shift toward acceptance, transcendence, and release from the restrictions they have faced. The environment of the dance becomes vigorous with the introduction of Nathan Daughtrey's dynamic percussion ensemble score, *Silent Canyons*. In response, the dancers' gradually expanding solo gestures embody the act of emerging from the isolation and limitations imposed by the pandemic. Cradling motions and tapping gestures on the chest serve as metaphors for navigating personal and collective trauma, seeking moments of grounding amid uncertainty.

The choreography's topographical pathways draw inspiration from eroding landscapes—such as icebergs breaking apart and shifting tides—symbolizing the gradual, inevitable process of change. The circular movements throughout the dance, aligned with the musical score, evoke the imagery of Ancestral Pueblo landscapes seen from above, layering history and time into the performance. The motif of sleeping in a spiral further connects to the idea of a people who have eroded but left an indelible mark on the land, as seen in their art and the soil itself. The choreography also emphasizes moments of connection and witness, with groups of dancers coming together to acknowledge one another, symbolizing the communal aspect of healing and resilience after shared trauma.

Figure 2. Embers & Ash performance image by Alexandra Bradshaw-Yerby.

Finally, the imagery of embers—through the costumes, the ash-drawing on the body, and the use of red and black for fire—represents both destruction and rebirth. The shimmering black glitter in the costumes evokes lava, while the ash on the dancers' bodies suggests the residue of something that has burned away, making space for renewal.

CONCLUSION

By blending personal and historical narratives, *Embers & Ash* highlights the enduring power of music and movement to process grief, build resilience, and foster transformation. Participating in *Embers & Ash* encouraged students to reclaim agency over their pandemic-era experiences, using art as a medium for healing and self-discovery. Dance student Taylor Tumminia reflected, “Collaborating on *Embers & Ash* was a pivotal moment in my dance career... a way to pay homage to generations of storytellers and stories told.”[17] Similarly, percussion student Conner Cushman remarked, “This project marked a shift in my understanding of performance arts... revealing a language of connection and healing.”[18]

Our screendance stands as a testament to the performing arts' profound ability to transcend verbal language, offering a deeper exploration of human emotion and events. While our article primarily focuses on the music and dance elements of this project, it is essential to acknowledge the significant contributions of costuming, lighting, staging, and film direction to the collaboration’s overall success. Ultimately, integrating art forms creates space for deeper engagement with personal and collective histories, making way for renewal and connection. Furthermore, this project reinforces that storytelling need not adhere to traditional structures to be impactful; rather, abstraction and collaboration expand the possibilities for meaning-making in the performing arts. Notably, following its premiere in the fall of 2020, *Embers & Ash* was recognized as an official selection at the 2021 Red Rock Screendance Film Festival. Future creative endeavors can draw from this model to explore how interdisciplinary collaborations deepen our understanding of self, community, and history through the synergy of movement and sound.

NOTES

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ENCHANTING DESTINATIONS WITH EUDAIMONIC BRAND STORYTELLING

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INTRODUCTION

Shaping our understanding of each other requires more appreciation of the various cultures in the world. Other ideas account for at least a culture on its own, creating a conflict, or even an intersection, of cultures from around the globe. There is a shift shaping our bias towards cultures outside of ours. Western bias is dominant in the social hierarchy, and the bid to confront those beliefs in time changes how various cultures are seen, revealing their complexity. Elucidating and constructing an explanation for far too long concepts and arguments that range in the moral aspect through tourism.

Targeting the Western bias in the story, this research calls to action for a change in its reliance on ethical ways of depicting complex theories. Focusing on a more profound and complex story aims to capture the holistic biodiversity of a place. For further emphasis on the change that this study presents, it portrays the spiritual traditions that have often been neglected or seen as irrelevant by the past, which has the potential to deepen the image through stronger connections to crucial locations that aim to showcase and glorify their very essence.[1]

This study aims to examine if adding eudaimonic storytelling into destination branding changes how people view tourism and if it aids in diversifying respect towards culture.[2]

THEORETICAL FRAMEWORK

Eudaimonic Narratives and Their Role in Tourism

For decades, the traditional approach to tourism marketing has revolved around an escapist story where travel was frequently marketed as a way to unwind and engage in entertaining activities.[3] However, a shift has occurred, where a significant subset of consumers are now actively looking for major value-driven and enriching ethical experiences during their travels, where eudaimonic narratives can be utilised significantly. The eudaimonic narrative emphasises doing good and focuses on doing 'good' by engaging with the consumer by adding virtue, cherishing memories, and enhancing their self-growth.[4].= Such structures are suitable for tourism advertising today, such as seeking a travel experience for deeper like looking for a reflection to seek solace in.

What eudaimonic narratives can do quite easily, however, and perhaps most effectively, is resonate with many places heavily embedded with cultural and spiritual practices, particularly those possessing deep animistic beliefs. When interacting with such a society, place and nature become part of the spirituality of an identity. Elevating such ideals in narrative and marketing is precisely where

eudaimonic storytelling occurs. It broadens the definition of destination branding, which also fights against the Western elite's tourism concept as it diminishes the local perspective of the culture's nuances.[5] This attains ethical tourism when aiming to preserve the particularity of the local societies and natural systems; it is when tourism as a friendly business occurs.

In addition, eudaimonic narratives foster a more responsible attitude towards travel following sustainable tourism trends. Eudaimonic stories promote an ethic of care for places rather than treating destinations as products to be consumed. Such a shift in perspective could lead to a more responsible and caring approach to tourism and travel, supporting and sustaining local communities and ensuring cultural resources are protected for future generations.

The Concept of Enchantment in Eudaimonic Storytelling

Eudaimonic storytelling emphasises "enchantment"- showing its viewers to places with rich history and meaning rather than just visual attractions.[6] In eudaimonic storytelling, enchantment transforms tourists into people willing to explore an area's untold stories and culture. This facilitates a whole new understanding of travel wherein one does not simply visit a point of interest but actively seeks to absorb information and context about the place, both emotionally and intellectually.

While enchantment does capture some aspects of eudaimonic narratives, the aforementioned cannot foster an economy built around the relationship visitors have with a place rather than a transaction that occurs. This fosters a more sustainable economy built around authentic attachment to local traditions and communities. Eudaimonic tourism focuses on reverie and respect as tools to gain a cultural understanding of a place rather than chasing empty hedonism where the ultimate goal is fleeting pleasure. This is of utmost importance as respectful engagement with culture and the surrounding ecology can foster community and improve the experience for everyone involved.[7]

Such a holistic view of eudaimonic storytelling can assist in formulating ethical tourism models centred around economic profitability and social and environmental responsibilities, providing a space for the place marketing itself as the preserver of cultural and natural richness. By integrating stories in which cultural integrity, maintaining sustainable approaches, and being more spiritually involved are at the forefront, tourism brands will be able to meet the increasing request for services that embrace the principles of respect, protection and promotion of world culture.

RESEARCH DESIGN

This study leverages a robust qualitative research design through 20 in-depth, semi-structured interviews with experienced travellers, primarily sourced from a Finnish Facebook community centred on travel enthusiasts. This specific group was selected to represent individuals engaged with tourism and active on social media, aligning with the study's goals of examining social media narrative effects. The research design, focusing on social media narrative effects, ensures the reliability and validity of the insights provided.

The subjects who participated in the research could view two different Instagram profiles of an invented destination. Kim & Youn[8] assert that one of the profiles accentuated hedonistic features while the other got into serious cultural aspects by emphasising storytelling. As described before, the first profile @visitanera2 emphasised eudaimonic elements such as telling stories about culture, environmental sensitivity and spirituality. Posts under this profile aimed to promote feelings of virtue, purpose, and personal growth. The second profile, @visit.anera, used the same imagery as the former. However, it excluded eudaimonic content and descriptive words associated with Destination Management Organization (DMO) and instead emphasised non-committal narratives targeting leisure.

Interviews followed a thematic analysis (TA) approach, ideal for extracting participants' perceptions and experiences related to the presented narratives. Clarke and Braun's[9] TA method was selected for

its flexibility and capacity to reveal explicit and underlying meanings from small qualitative datasets. Initial codes were generated from the data, then organised into themes through inductive, exploratory analysis, enabling emergent insights about the impact of narrative styles on destination perception. Participants' responses highlighted key themes of depth, complexity, and authenticity. The data indicated that eudaimonic narratives fostered a more engaging and meaningful image of the destination, which differed significantly from the responses to hedonic narratives.

FINDINGS

Depth and Complexity in Eudaimonic Brand Perception

The theme of "complexity and depth" emerged as a significant insight from this study, illustrating how eudaimonic narratives in brand storytelling shape the perceived image of a destination beyond superficial leisure. Participants exposed to eudaimonic storytelling perceived the destination as a location for scenic enjoyment and where meaningful cultural and personal growth could occur, adding rich layers to its brand image. This shift toward a more substantial, heritage-based perception aligns with the need for greater cultural awareness and depth in tourism branding, encouraging an image that resonates with authenticity and historical richness.[10]

Positive Associations with Sustainability and Social Responsibility

An unexpected yet insightful finding was how sustainability surfaced prominently in participants' discussions despite no direct prompt on this theme. Eudaimonic narratives organically led participants to associate the destination with environmental and social sustainability. This narrative style triggered reflections on sustainable travel and social responsibility, suggesting that storytelling which emphasises cultural and spiritual depth fosters an intrinsic appreciation for conserving the destination’s social fabric and ecological resources. Participants saw eudaimonic elements as a respectful and mindful tourism approach, an antidote to mass tourism's often extractive practices.

Enhanced Engagement through Peripheral Perspectives

Eudaimonic storytelling and including elements from cultural peripheral and animistic narratives impressed the participants by showcasing the destination’s less highlighted cultural aspects. Such narratives delisted the brand from the mainstream by providing an authentic cultural experience that deeply connected the brand to consumers. This kind of storytelling facilitated the participants’ cultural understanding in greater depth, positioning the offered destination as a site for ethics and spirituality and not purely for entertainment. The accompanying perspectives around the destination brand appealed to travellers seeking efficacy, cultural immersion, and ethical involvement.

Implications for Eudaimonic Storytelling in Tourism

These findings underscore the potential of eudaimonic storytelling in tourism to foster a complex, ethically rich, and sustainable destination image. By prioritising depth and cultural authenticity, such narratives help travellers see beyond temporary enjoyment and aim for experiences that foster personal growth and societal respect.[11] Eudaimonic storytelling can serve as a powerful differentiator in tourism branding, incredibly when grounded in cultural values and spirituality, effectively combating the homogenising tendencies of conventional tourism marketing. This approach aligns with sustainable tourism goals, counteracting consumerist tendencies by promoting a model emphasising ethical and immersive cultural experiences.

DISCUSSION AND CONCLUSIONS

This work sought to resolve the research objective, which examines your question that eudaimonic storytelling in destination branding can serve as a counterweight by weaving together deeper culturally sensitive tourism stories that align with the global aim of being straight and socially responsible. Interview transcripts are used in this study as evidence to establish how telling a story focusing on its purpose, culture, and religion would change perceptions of a place among the audience by conducting semi-structured interviews, looking at two types of posts – hedonic and eudaimonic. The findings indicated that eudaimonic storytelling enhances the image of the place in the minds of tourists as a complex structure that contains the notion of the place as a site of cultural interaction and places promoting ethical tourism.

Using thematic analysis, the study revealed that the audience of eudaimonic stories regarded this brand as offering more meaning than an entertainment-related focus. Such narrative themes reinforced the need to promote respecting the native people and the environment and achieving a result that can help develop a new inner self. These stories captured the attention of tourists looking for something more tangible and ethically satisfying. They provided a good direction for tourism marketers who strive to make their brands memorable in a highly competitive environment.

This paper recommends using eudaimonic narratives in destination branding to enhance respect for cultures while maintaining tourism practices. By deconstructing enchantment, virtue, and culture into stories, tourism brands can design experiences that encourage the traveller to have a real connection to the place. Primarily, when the media story is focused on the Western idea only, eudaimonic narratives tell a better story and integrate outside perspectives, which are core to the story.[12]

As the markets for genuine and active engagement increase, eudaimonic narratives support the strengthening and differentiation of the organisations. This battens the encouragement of travellers for authenticity and supports the narrative of them being ethical and responsible for their actions.[13] So, Readers need to re-orient themselves to the philosophy of tourism destroying both the ecosystems and the pluralism of the world.

Theoretical contribution

This study contributes to the field of tourism marketing by providing insights into how eudaimonic storytelling can reshape destination branding through more profound, culturally grounded narratives. Eudaimonic narratives—focused on purpose, moral virtues, and personal growth—offer an alternative to the traditionally hedonic approach in tourism marketing. Prior research has established that eudaimonic storytelling in general media can evoke introspection and emotional responses.[14] However, this study extends this theory to tourism marketing, revealing that eudaimonic narratives enhance perceptions of a destination by making it seem more authentic, culturally rich, and transformative.

The findings demonstrate that eudaimonic storytelling can elevate destination brands, encouraging audiences to consider tourism through a reflective and ethically enriched lens. Specifically, participants exposed to eudaimonic Instagram narratives reported feelings of complexity, depth, and authenticity in their perceptions of the destination.[15] This supports the notion that eudaimonic narratives foster a more engaging and distinct image, which has been suggested by previous research in media psychology[16] and aligns with the broader calls within tourism academia for greater inclusion of eudaimonia in tourism research.[17]

Managerial Implications

The study highlights the practical benefits of adopting eudaimonic storytelling in social media destination marketing for practitioners. Eudaimonic narratives attract attention and differentiate destinations by appealing to tourists' desire for authentic, reflective experiences. Unlike typical hedonic appeals, eudaimonic narratives do not detract from consumer interest or satisfaction; they cultivate a unique and memorable image of the destination. Tourism marketers can better align with consumer values surrounding sustainability and meaningful travel by emphasising cultural and spiritual values.[18]

Furthermore, as shown in the study, eudaimonic narratives can be strategically applied on platforms like Instagram to evoke emotional engagement and convey a sense of transformative tourism, resonating with individuals seeking ethical and responsible travel options. This suggests balancing beautiful visuals with more informative and reflective storytelling content for tourism brands to captivate potential visitors while communicating an authentic brand identity.[19]

By combining cultural storytelling with modern digital platforms, brands can use eudaimonic narratives to support long-term engagement and consumer loyalty, positioning themselves as leisure destinations and spaces for personal growth and ethical exploration.

Evaluation of the Study

The study's qualitative approach offered nuanced insights but limited generalizability. Notably, the small, homogenous sample—broadly experienced travellers active on Instagram—may not represent diverse consumer responses to eudaimonic narratives.[20] Additionally, translating interviews from Finnish to English and the researcher's influence may have subtly affected data interpretation.[21] Participants' occasional frustration upon discovering the fictional nature of the Instagram profile may also have impacted their engagement, suggesting that reactions to authentic destinations could differ.[22] Lastly, focusing solely on Instagram restricts insights into how eudaimonic narratives might perform on other digital platforms with different user dynamics.[23]

Future Research

Future studies could expand on these findings by incorporating more extensive and diverse samples to determine if responses to eudaimonic storytelling vary across demographic groups.[24] Cross-cultural research could also explore if the appeal of these narratives is universal or culturally specific, particularly given the spiritual and reflective nature of eudaimonic themes. Given the evolving social media landscape, platform-specific analyses would show how eudaimonic content performs across various platforms.[25]

Quantitative research could help measure specific emotional and cognitive impacts, complementing qualitative insights with concrete psychological data.[26] Longitudinal studies would be valuable for assessing if exposure to eudaimonic narratives leads to sustained behavioural changes, particularly in promoting sustainable tourism practices.[27]

While this study emphasises eudaimonic storytelling's potential to differentiate destination brands, additional research across broader contexts, platforms, and cultural settings will further clarify its impact and effectiveness in transforming tourism marketing.

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REAL-TIME GENERATIVE STORYTELLING THROUGH TANGIBLE AI: AN EXPERIMENTAL PARADIGM FOR SPATIAL COMPUTING AND HUMAN – AI INTERACTION

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INTRODUCTION

In today's digital landscape where artificial intelligence (AI), digital systems and physical spaces increasingly converge, *Crafting Narratives* investigates the potential of real-time generative storytelling through tangible interfaces as an engaging tool for cultural exchange. The first iteration of this interactive installation was presented in Toronto, Canada, and engages the Gond Tribe's[1] Creation Myth[2] as a real-time storytelling experience. It not only reimagines storytelling in public spaces through tangible AI but also situates it within the broader context of migration and cultural exchange, highlighting how urbanization transforms oral traditions into dynamic, participatory experiences. By integrating spatial computing, human-computer interaction (HCI), and generative AI, the installation adopts an unconventional approach to developing a three-dimensional interaction system that blends the physical and digital worlds, offering both a critique of current practices and proposes a new model for engaging with cultural heritage in the urban environment.

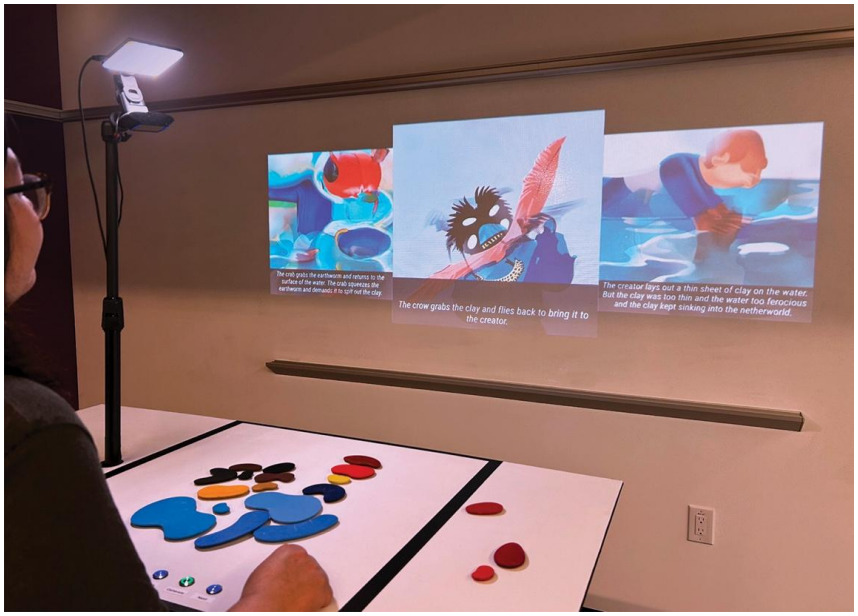

Figure 1. View of User's creation using the project interface and the re-imagined generative visuals

Establishing the Context for Research

Urbanization has drastically reshaped the social, economic and cultural fabric of cities worldwide. This has brought diverse communities from varied backgrounds into cities, leading to the exchange of knowledge, culture and narratives that were once confined to specific regions. This phenomenon aligns with Arjun Appadurai's concept of "scapes," particularly the "ethnoscapes" (flows of people) and "mediascapes" (flows of narratives and images), which highlight the fluid and interconnected nature of contemporary cultural landscapes.[3] Urbanization acts as a catalyst for broader cultural dialogues, where diverse traditions intersect and influence each other, creating new forms of cultural expression. The installation investigates the potential of urban public spaces facilitating the exchange of native narratives through tangible AI.

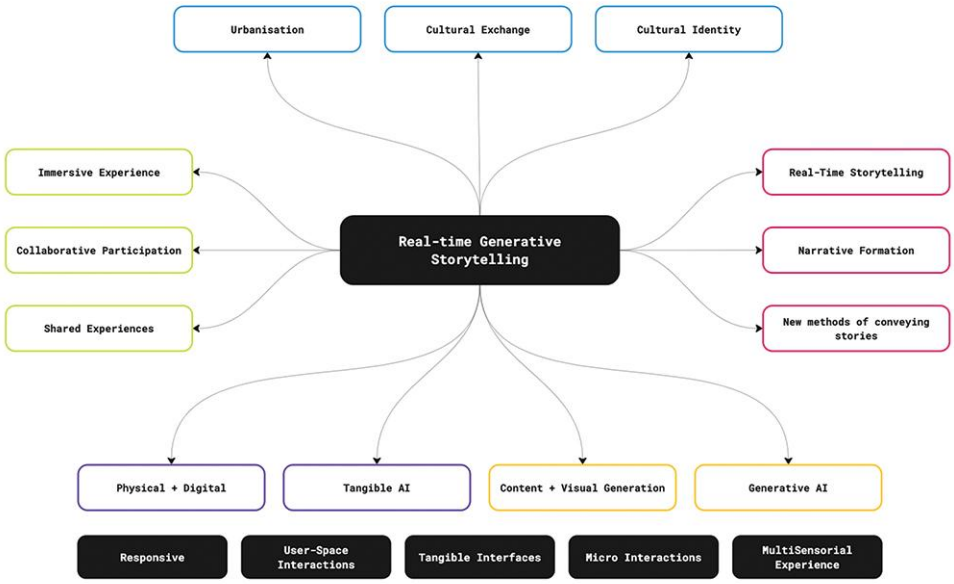

Figure 2. Schematic overview of areas of research

Tangible Objects as Interfaces

Tangible User Interfaces serve as material representations of data, enabling users to interact with digital information through physical manipulation. The tangible objects in the installation challenge users to interpret, visualize and build their own versions of the scenes, to form and shape the narrative. The scene built using these objects serves as a foundational image, which the AI model then processes into a digitised visual. The elements in the virtual world coexist alongside the tangible objects, interact with each other, and complete the narrative. This hands-on approach to storytelling through tangible objects enhances user engagement by allowing viewers to playfully shape the narrative without engaging the complexities of the image generation model.

Storytelling

In this installation, the generative nature of the storytelling process and the interactive component function as a shared space. This allows viewers to physically engage with the tangible objects, while co-creating with AI to reveal the creation myth scene by scene. The installation embodies this essence by allowing the narrative to unfold adaptively and non-linearly based on the participant's interactions

and creations. The installation also creates a space that is collective and collaborative, allowing multiple viewers to either engage or observe other participants' creations. The installation preserves the performative and contextual essence of oral storytelling traditions, integrating the surrounding space as an active element of the narrative. The criticality of the space lies in presenting a story native to an Indian tribe as an interactive installation within a Western context, engaging diverse Canadian audiences in a cross-cultural exchange. The storytelling techniques embedded within the creation myth narrative structure serve to explore the potential of digital media, offering participatory modes of engagement that create opportunities for reviving aspects of communal storytelling in urban spaces.

The Creation Myth Narrative

Creation myths often signify the origin of the universe, values of existence and the purpose of life. Based on the origin, these stories reflect strong cultural values, belief systems, and understandings of the world based on approaches held by communities across the globe. Furthermore, the diversity of creation myths from cultures allows individuals to understand the various worldviews through the lens of diverse cultures. In *The Historical Development of Mythology,* Joseph Campbell examines a "comparative approach" for cross-cultural analysis to understanding myths from diverse cultures to identify common themes, motifs, and patterns.[4] He believed that studying these similarities could offer insights into the universal human experience and the psychological functions of mythology.

The creation myth narrative emerges as a powerful metaphor in the context of this installation blurring the conventional boundaries, prompting us to question: who truly is the creator? Is it the human user, wielding the generative AI model as a tool, or is it the AI model itself, with its intricate algorithms and capacity for autonomous generation? Moreover, the diverse outputs generated by each iteration underscore the universality of creation myths, revealing how these narratives manifest in varied forms across different cultural and contextual landscapes. This installation not only sheds light on the dynamic interplay between human agency and artificial intelligence but also emphasizes the fluid nature of storytelling traditions, wherein multiple versions coexist and evolve over time.

THE GOND TRIBE'S CREATION STORY

The Gonds, the largest Adivasi[5] Community in Central India are of Dravidian origin (ethnolinguistic group of ethnic groups native to South Asia) and can be traced to the pre-Aryan era. The origin of the word Gond is derived from the Kond; Kond in the Dravidian idiom means green mountains. Gonds are organically connected with nature, and they called themselves Koi or Koiture.[6] The people of this community were often called Gond since they lived in the green mountains. This myth is rooted in animist philosophy, as they are the people of the green mountains, unveiling the mysteries of existence in a very interesting manner.

Gond Creation Myth

According to the Gond's, A nameless creator who they named Baba Deo or Mahadeo, sits on a lotus leaf envisioning the creation of the world. The creator realizes the need for clay, collects the congealed dirt from his chest and forms a crow, sending the crow on an expedition to acquire clay for creating the world. The crow grows tired after an endless search flying over a large body of water. The crow lands on the claw of a crab (called Kekda Mal) peeping out of the water, mistaking it for a stump. The crow began telling the crab his tale of woe. The crow said he could not go back without clay because the creator asked him to get some to create the world, but there was nothing but water all around. The crab informs the crow that the clay is consumed by the earthworm in the netherworld. The crab assures the crow that he will help retrieve the clay. The crab goes under water and confronts the earthworm asking him to give him clay. The earthworm refuses to give the clay, claiming clay as

its food. The crab grabs the earthworm and returns to the surface of the water. The crab squeezes the earthworm and demands it to spit out the clay. The crow grabs the clay and flies back to bring it to the creator. The creator lays out a thin sheet of clay on the water. The water was too ferocious for the thin clay and the clay kept sinking into the netherworld. The creator summons a spider (called Makda Dev) and seeks help. The Spider spins and weaves a web across the large body of water. The creator spreads the clay on the web weaved on the water and prepares to create the world. The creator then releases animals, birds, and other living beings onto the earth.[7]

Migration & Cultural Exchange

The Gond creation myth was first encountered for this research in an urban academic setting at the National Institute of Design in Ahmedabad, India. Here, a version of this narrative was introduced through a classmate from the Gond community. Later, another version of a creation myth from the Munda Tribe[8] community was encountered while designing experiences for the Birsa Munda Museum in Ranchi, Jharkhand. This version of the narrative mirrored closely with the Gond's narrative, sharing the same characters and archetypes with slight variation. Given the geographical proximity of these tribes in Central India, the similarities in their narratives highlight how oral traditions evolve within cultural intersections. The Gond tribe's creation myth story echoes their spiritual connection to the forest while offering an interesting symbolic framework for understanding their culture, values, and their place in the world.

Since these stories have only been passed on orally through various generations, it illustrates how urban cities serve as spaces for exchange of cultural and reginal stories with diverse communities beyond their native contexts. While documentation of these narratives remains spares, urban spaces serve as cultural crossroads where narratives are a part of a larger conversation facilitating exchange across communities and ensuring the passing of this knowledge in contemporary contexts.

NEW INTERFACES IN STORYTELLING

The practice of storytelling has evolved over time encompassing various mediums and is prevalent across diverse cultures. Stories were shared by humans over generations, from sitting around a campfire listening to tales of ancestors to watching films and other content on television, humans are inveterate producers and consumers of stories.[9] Historically, storytelling was an oral tradition interwoven with societal values, performed in communal gatherings to preserve wisdom and pass cultural narratives across generations. Contemporary interactive tools allow for these traditional forms to be expanded to engage both the teller and audience in new ways.

Contemporary Storytelling

The present-day technological landscape presents a vast range of storytelling mediums, far surpassing traditional mediums such as literature and film. In Marie Laure Ryan's work "Narrative as Virtual Reality," she delves into the constructive collaboration between storytelling and digital technologies. She explores the semiotic phenomenon of VR (Virtual Technology) and rethinks textuality, narrativity, and the cognitive processing of texts considering the new modes of artistic world construction that have been made possible because of the technological development.[10] The concept of immersive experiences has redefined how we engage with narratives blurring the lines between author and audience. Transformative immersive technologies like AR (Augmented Reality), VR (Virtual Reality) and MR (Mixed Reality) allow users to be a central part of the narrative blurring the lines between reality and fiction. The term 'interactive documentary' was coined by Mitchell Whitelaw in the year 2002, to describe those documentaries that challenged the principle of narrative coherence. "A space where maker and user select individual elements thereby changing and

producing multiple relations between these elements".[11] Interactive documentaries enable non-linear storytelling experiences, allowing the user to navigate through the narrative based on their preferences.

The evolution of storytelling mediums from traditional formats to modern digital non-linear formats, has been influenced by technological advancements and the approach towards participatory modes of engaging with narratives. Generative AI specifically shows potential as it can generate multi-modal content such as text, audio, images, videos, and even three-dimensional models, is already demonstrating its capabilities[12] through models like ChatGPT,[13] Midjourney,[14] and Deep Brain.[15] With AI-driven storytelling, experiences can be customized as per individual's preferences, creating unique experiences for each user. The user's choices directly impact the story and challenge the traditional author/narrator-audience roles. This evolution reflects the dynamic interplay between technology, culture, and human creativity. The adaptation of technology creates a scope for preserving historical narratives; digitizing these narratives serves as a form of documentation and provides access to a diverse audience beyond the native contexts.

CRAFTING NARRATIVES: THE INSTALLATION

Crafting Narratives was presented at OCAD University, Toronto in partial fulfillment of the requirements for the degree of Master of Design in Digital Futures. As visitors stepped into the installation, they viewed the dynamic projection on the walls, depicting two scenes from the myth (previous and next). As visitors observe the two scenes projected on the walls, they are prompted to imagine and interpret the narrative that unfolds between these frames from the creation myth. Visitors are encouraged to interact with the tangible objects, selecting and placing them on the dedicated creation are on the plinth. As visitors curate their own arrangement of objects, they become active participants in shaping the narrative journey. After the initiation of generating the visuals based on their creation, they are prompted to reflect on the connection between the AI-generated visuals and their interpretation of the story.

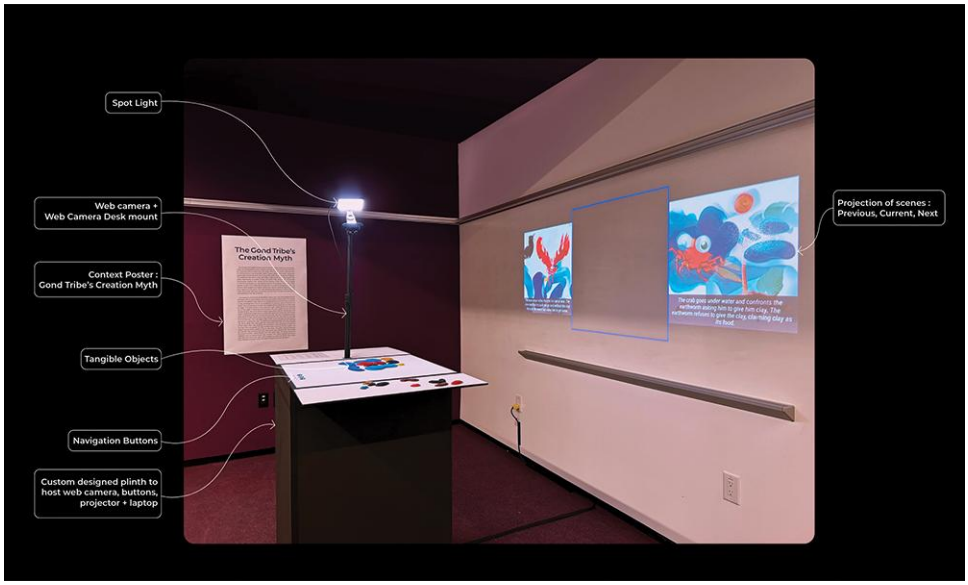

Figure 3. Components of the installation

Physical – Digital Interfaces

The concept of abstraction to realism guided the design of the tangible objects, where the abstract scenes created on the table translate to a realistic AI-generated visual. Keeping in mind the affordances of tangible objects, they were designed as two-dimensional abstract-colored forms. The color palette was carefully chosen to resonate with the elements of the Gond creation myth while maintaining sufficient contrast to enhance the AI model's ability to generate distinct and detailed visuals.

Figure 4. Tangible objects, Designated creation area, Analog navigation buttons (Right), User Guide Instructions (Left)

The interface was designed and fabricated to serve three primary functions: housing all electrical components, including the projector, laptop, wiring, and web camera; embedding physical computing elements (buttons) on the top surface; and providing an extended surface beyond the creation frame for holding the tangible objects and user guide instructions. A physical button enables users to control the AI-generated visuals, while two additional buttons allow navigation through different scenes, enabling a non-linear storytelling experience. A designated area on the interface, marked by tape, guides users in composing their scenes, with unused objects placed outside the frame. Instructions on the left side provide users with guidance on engaging with the interactive components of the installation. The physical layout of the interface creates a social space inviting multiple users to collaborate in unfolding the narrative, emphasizing a dynamic interplay between Human-Human-AI rather than a singular Human-AI interaction. This shared space of creation transforms into a site for cultural exchange, where the process sparks conversations on interpretation, adaptation and assimilation.

Visual Mapping: Screen to Space

Inspired by the affordances of a traditional film strip, the visual layout featured three frames (previous, current, and next), allowing users to navigate and pause at specific segments of the Gond creation myth. The projected visuals were accompanied with the script for the previous and next frame from the selected segment of the Gond creation myth. These were pre-recorded frames developed using the same objects. This allows the user to imagine and interpret the narrative that unfolds between these two moments. As users were unaware of the prompt used to generate the

current frame, it creates an interesting dialogue between what it means to prompt a human vs prompting an AI model. The narrative progression is visible when the Human-AI generated visual fills the gap between these two frames. Visual cues were also added to the projection when the generate button is pressed, indicating to the user that the scene generation process has been initiated. The text prompt (script of the current scene) is also revealed along with the visual cue, allowing the user to process and understand the progression of the narrative. The scene constructed on the plinth seamlessly translates into the missing frame in the projection, enabling users to compare their creations with the AI-generated visuals. A timer function was set up to automatically reset the generated scene to a blank frame after 25 seconds.

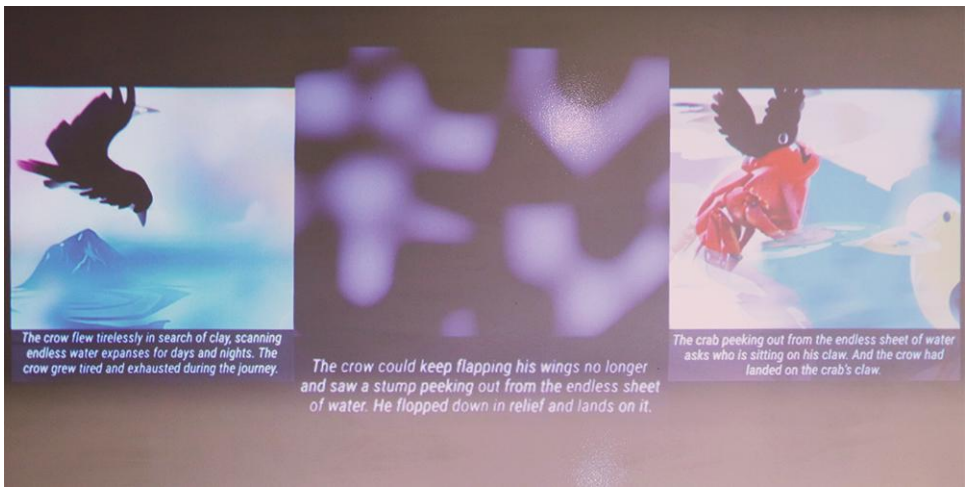

Figure 5. Projection: Previous scene (pre-recorded) with Script, Current scene loading with Script, Next scene (pre-recorded) with Script

Image Generation

The pipeline for the installation was developed using TouchDesigner to run Stable Diffusion[16] locally, for its ability to seamlessly communicate with other software via OSC messaging. Stable Diffusion was integrated using Compute(r)ender,[17] an open-source third-party API that provided a cost-effective solution for image-to-image generation. The AI model operates on an Image-to-Image generation principle, where a web camera captures the tangible scene created by users, and the AI reimagines it based on a predefined script prompt. The prompts used in the AI model were the same as the script of the story presented to the user in the format of a poster. The intent was to prompt both the human and the generative AI model with the same text, creating a scope to critically analyze what it means to prompt a human vs a system that is made to think like a human. Key parameters such as Seed, Iterations, and Guidance scale were adjusted to balance abstraction and realism in the generated visuals. Each generation produces a different output, allowing the same scene to be reimagined in infinite ways. The advantages of deploying generative AI in this context extend beyond personalized visual creation, as the model's output is directly shaped by the user's arrangement of tangible objects.

Figure 6. Varied outcomes of the Human-AI creation of one scene

FUTURE WORK

The interactive installation as a tangible AI-driven storytelling space showcases tremendous potential for reimagining storytelling. Future developments will further explore the role of such interactive spaces in encouraging cultural exchange and community engagement in urban environments. Public spaces can be reimagined as dynamic storytelling environments, where the installation can be scaled to encourage participation, and collaboration within diverse communities. By integrating this installation into community arenas, events, and cultural festivals, it can serve as a medium for shared storytelling, social cohesion, and encourage dialogue between different cultural communities.

Figure 7. Concept render of the scaled installation in an urban public space

The meaning of the installation would shift depending on the audience's backgrounds, experiences and local histories. The Gond creation myth might be interpreted differently in different cities, highlighting how cultural perception shapes storytelling and allowing audiences to see it as an entirely new perspective, prompting curiosity and reflection on cultural storytelling traditions beyond their own. As cities become hubs for diverse ethnicities, the need for such storytelling systems within public spaces becomes essential for revitalization of traditional narratives. The installation serves as a bridge between culture, tradition and technology, demonstrating how AI can facilitate the reinterpretation of oral traditions in contemporary urban spaces.

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DEMOCRACY IN ENVIRONMENTAL STEWARDSHIP: PARTICIPATORY SENSING NETWORKS FOR URBAN COASTAL MONITORING

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INTRODUCTION

Urban coastal regions face unprecedented challenges from environmental change and human intervention.[1] These areas must contend with rising sea levels, increasing storm intensity, ecosystem degradation, loss of biodiversity, and infrastructure pressures while balancing economic development, population growth, and sustainability requirements. While these challenges threaten coastal communities worldwide, they also present a critical opportunity to fundamentally transform and strengthen community-environment relationships for a more resilient future.[2]

The Intergovernmental Panel on Climate Change (IPCC) latest assessment confirms accelerating impacts on coastal communities, with increasingly severe ecological disruptions.[3] These findings, based on decades of environmental monitoring and climate research, underscore the growing vulnerability of coastal regions worldwide.

Traditionally, environmental monitoring has been conducted by centralized institutions, often limiting direct engagement from local communities and creating a gap between scientific data and decision-making processes. However, the emergence of participatory sensing networks (PSNs) marks a significant shift in how coastal environments are observed and managed. By integrating community-driven data collection with advanced technologies, PSNs enhance real-time environmental awareness, foster local engagement, and provide more granular insights into climate-related changes, ultimately bridging the gap between scientific research and actionable policy responses**.**

In coastal regions, where biodiversity loss is accelerating, the stakes are particularly high. Declining marine ecosystems directly impact human well-being, affecting fisheries, storm protection, and water quality.[4] The integration of PSNs into coastal management offers a pathway to more inclusive, data-driven decision-making, ensuring that local communities play an active role in shaping resilient and ecologically sustainable futures. This transformation exemplifies smart cities' evolution, where digital technologies reshape how spaces are monitored and experienced.[5]

The democratization of environmental data collection through PSNs addresses a critical question: how can these technologies bridge the gap between expert knowledge and public participation? At its core lies the concept of digital democracy—ensuring equitable access to environmental data, empowering citizens to actively participate in climate resilience efforts and the decision-making processes that shape their communities.[6] By connecting specialized knowledge with community experience, these networks enhance both scientific understanding and civic engagement. PSNs leverage decentralized,

community-driven data collection to supplement traditional monitoring systems, integrating citizen science, real-time sensor technologies, and data-sharing platforms.[7]

This paper examines the design and deployment process of three PSN initiatives in various stages of development: 1) Water Wand – A portable Internet of Things device for urban flood monitoring and water quality assessment; 2) SMARTblox – A modular, Artificial Intelligence-driven infrastructure integrating bio-enhanced seawalls with ecological monitoring; and 3) In Deep Water – A Mixed Reality experience for climate literacy through interactive visualizations.[8] These projects combine architecture, media arts, and environmental technology, showcasing how interdisciplinary approaches inform the creation of participatory environmental tools.

By analyzing the design methodologies, technical challenges, and initial deployment strategies of these projects as case studies, this paper aims to document the development process of community-driven monitoring systems, identify key considerations in their implementation, and propose frameworks for future testing and evaluation as these projects mature.[9] The paper explores how design decisions shape public participation possibilities, examining the technical and social dimensions of creating accessible environmental monitoring technologies.

The findings highlight the methodological approaches to designing digital platforms for climate resilience, focusing on the interplay between technological innovation, user-centered design, and community engagement.[10] This research contributes to understanding the development pathways of participatory environmental technologies while considering their potential impacts on public participation and environmental governance.[11]

DIGITAL DEMOCRACY AND PARTICIPATORY SENSING NETWORKS

The Role of Digital Democracy in Environmental Governance

Environmental governance increasingly embraces digital platforms to enhance transparency and public participation in policies and decision-making with respect to climate.[12] Digital democracy refers to the use of digital tools and open-data infrastructures enabling citizen-driven environmental monitoring and policy influence through collective intelligence.[13] This approach represents a departure from traditional top-down governance models to create new spaces for civic participation.

Studies show that decentralized environmental monitoring frameworks enhance trust and community engagement in resilience planning.[14] These frameworks align with the objectives of the three PSN initiatives presented in this paper. However, challenges remain in realizing digitally democratized governance, including barriers of data literacy, technological access, and policy integration.[15]

Open-access participatory environmental data platforms enable communities to contribute real-time information, enhancing early-warning systems and disaster response.[16] This evolution in citizen engagement illustrates how technology can revitalize civic participation, creating hybrid forms of spatial interaction central to the Water Wand and In Deep Water projects. While community-generated data strengthens knowledge co-production,[17] studies caution that without clear mechanisms for policy action, such engagement may remain performative rather than transformative—a challenge our design approaches explicitly address.[18]

Technologies Driving Participatory Sensing Networks

The technological infrastructure supporting PSNs combines several emerging technologies that collectively enable more democratic approaches to environmental monitoring. Internet of Things (IoT) sensor networks have revolutionized environmental data collection through distributed devices capturing real-time measurements across geographical areas.[19] These networks employ low-cost, energy-efficient sensors monitoring parameters such as water quality and flooding events—functions central to both the Water Wand and SMARTblox projects. Affordable microcontrollers and wireless

communication protocols have enabled dense sensor networks in urban coastal regions, providing granular data previously unattainable.[20]

Artificial Intelligence (AI) and big data analytics transform raw sensor data into actionable information. Machine learning algorithms identify patterns and correlations in environmental data that might be imperceptible to human analysts.[21] Predictive modeling enables forecasting of environmental changes, giving communities advance warning of potential threats. The SMARTblox project leverages these capabilities to optimize both physical design and monitoring functions, representing a democratization of technologies once exclusively accessible to specialized institutions.[22]

Mixed Reality (MR) and data visualization transform abstract environmental data into intuitive, immersive experiences enhancing public understanding.[23] By overlaying digital information onto physical environments, MR platforms make complex ecological processes more accessible to non-expert stakeholders—a primary objective of the In Deep Water project. These approaches bridge the gap between scientific knowledge and public perception, fostering greater climate literacy.[24]

Blockchain provides tamper-proof systems for verifying the authenticity of community-contributed data.[25] This technology addresses reliability concerns by creating immutable records of measurements—a feature incorporated into the Water Wand project. By establishing trust in participatory data sources, blockchain facilitates integration of community information with official monitoring databases, enhancing citizen science legitimacy in policy-making.[26]

These complementary technologies transform environmental monitoring by democratizing sophisticated tools while maintaining scientific credibility—enabling communities to meaningfully participate in data collection and governance of urban coastal spaces.

CASE STUDIES OF PARTICIPATORY SENSING NETWORKS

The three participatory sensing initiatives presented in this paper employed Design-Based Research (DBR) methodology with an interdisciplinary, mixed-methods approach. DBR addresses real-world problems through iterative design processes that integrate theory with practice.[27] This methodology involves prototype refinement and testing cycles, adapting to user needs across architectural, artistic, and environmental domains.[28] This interdisciplinary framework connects theoretical concepts with practical implementation of participatory environmental technologies.[29]

Water Wand: Empowering Citizens through Participatory Flood Monitoring

Rising sea levels and increasing storm severity have placed over 1.47 billion people at flood risk worldwide, with devastating consequences for urban coastal communities.[30] Traditional flood monitoring systems often lack spatiotemporal coverage, creating critical information gaps that hinder effective response and planning.[31] As communities face these challenges, participatory approaches to environmental monitoring offer alternatives to conventional infrastructure-based solutions.[32]

Water Wand is a crowdsourced hydrometry platform developed to enhance citizen engagement during Florida International University's (FIU) annual Sea Level Solutions Day. Running since 2015, this initiative brings together citizens and scientists to document the extent of flooding during King tide events – the highest high tides of the year. The technological infrastructure centers around an accessible hardware platform using Raspberry Pi microcontrollers with Bluetooth connectivity. The current device measures water temperature, turbidity, salinity, dissolved oxygen, and depth. The form of Water Wand is designed to use minimum material for 3D printing while maintaining ergonomics for carrying sensors and ensuring user-friendliness during field interactions. This optimized design holds all sensors securely while providing comfortable handling during extended monitoring sessions. An integrated LCD screen displays real-time values directly on the device, allowing immediate verification of readings without requiring the mobile application. Participants use the Water Wand to

collect data in flooded areas, with the device featuring a rechargeable lithium battery and 3D printed custom parts. It operates by pressing a single button to activate all sensors simultaneously, ensuring technical sophistication does not compromise accessibility – as illustrated in Figure 1.

A distinctive feature is the blockchain-backed data verification system, which prevents manipulation and enhances the credibility of citizen-collected information.[33] The companion mobile application integrates with MapBox to visualize flood risk assessments and community reporting. Connected via Bluetooth, the app displays readings in an intuitive format and allows users to contribute to a centralized database. GPS functionality geotags each reading, creating a comprehensive map of water quality measurements alongside photos documenting the sampling process.

Water Wand has been developed and tested on a small scale with students and faculty, with the final version currently under development. A key aim of the project's ongoing development is to transform the application into a location-based mixed reality experience, allowing users to visualize historical flood data, projections, and real-time measurements overlaid on their actual environment. The project team is engaged in strategic planning to scale up production while lowering costs and maintaining quality. By democratizing water quality monitoring, Water Wand transforms citizens into environmental stewards who contribute meaningful data to understand and address local flooding issues, demonstrating how technological innovation can strengthen community connections to place through participatory environmental sensing.

Figure 1. Water Wand's iterative refinements in ergonomics, sensor integration, and material optimization through DBR methodology, creating an accessible citizen science tool for monitoring.

SMARTblox: Integrating AI and Community Engagement in Coastal Protection

Building on participatory sensing approaches, SMARTblox addresses the critical intersection between shoreline protection and environmental monitoring through adaptive coastal infrastructure. This initiative represents an advanced environmental monitoring system that supports marine ecosystem restoration while providing real-time data on key water quality parameters—temperature, pH, salinity, and dissolved oxygen—using solar-powered technology for sustainable operation.[34] Embedded within these 3D printed concrete modules is an array of IoT sensors that continuously monitor environmental parameters. These sensors connect to a networked SQL database with a public API, allowing real-time monitoring of coastal conditions by both environmental agencies and community members.[35]

SMARTblox is part of the broader Ecoblox project—an NSF-funded research initiative aimed at developing and testing an innovative interlocking modular system for shoreline construction that integrates with both existing and new seawalls. In collaboration with the EPA-funded BIOCAP initiative, the project leverages big data analytics, networked sensors, AI-powered generative parametric design, and robotic fabrication to create data-driven, adaptable infrastructure components. Each Ecoblox module—whether a structural block, a habitat-enhancing tile, or a SMARTblox sensor unit—is designed to fit together seamlessly, forming a barrier that can be customized to local coastal needs. While non-sensor Ecoblox modules focus on providing physical resilience and habitat opportunities, the SMARTblox units bring continuous environmental monitoring into the system. The system consists of two separate tiles—one placed in the intertidal zone (housing the sensors) and another in the supratidal zone (containing a battery pack, antenna, and solar panel)—ensuring a steady supply of clean energy – as illustrated in Figure 2. Currently under development, SMARTblox has received permits for installation at several sites along Biscayne Bay and connected rivers. Recent hardware upgrades have made the units more compact, efficient, and adaptable. The exterior assembly has been redesigned to interlock with the geometric contours of coastal walls, allowing the system to replace or supplement traditional seawall segments. On the data management side, SMARTblox employs a relational SQL database to store and organize sensor readings in a user-friendly format.[36]

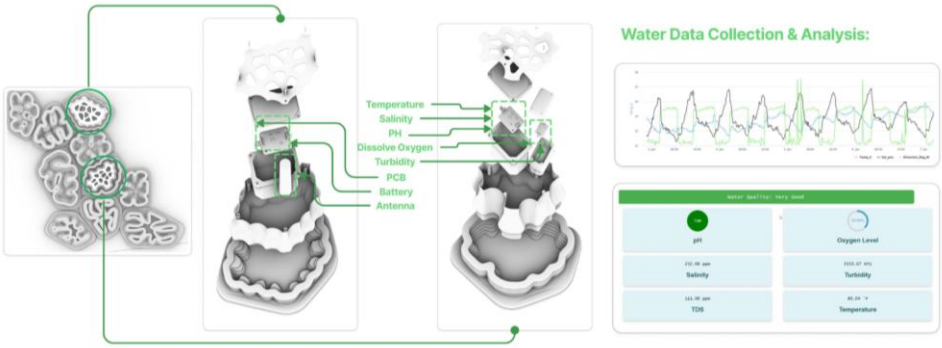

Figure 2. SMARTblox iterations showing integration of bio-enhanced surfaces with environmental sensing technology for deployable coastal infrastructure modules.

A core principle of the Ecoblox initiative is making coastal monitoring accessible and cost-effective for local communities. By using open-source technologies, modular components, and solar power, the project keeps expenses manageable, allowing even waterfront homeowners or small community groups to install and maintain the system. This focus on affordability and simplicity strengthens community engagement, turning residents into citizen scientists who can collect water quality data and share their findings with researchers and policymakers.

Beyond its technical merits, SMARTblox emphasizes digital democracy in environmental stewardship. By providing open access to data through interactive dashboards and visual summaries, the system encourages dialogue on issues such as shoreline health, water pollution, and habitat restoration. Schools and local groups can "adopt" specific blocks, contributing to a shared pool of knowledge and strengthening community ties. This collaborative approach demonstrates how technological systems can enhance rather than diminish social cohesion, creating new forms of collective engagement with shared environments.

In Deep Water: Transforming Climate Data through Mixed Reality Experiences

Building upon the participatory data collection of Water Wand and ecosystem monitoring of SMARTblox, the In Deep Water project addresses the critical challenge of data accessibility and stakeholder communication. This initiative employs MR technology to transform how environmental data is visualized and understood, making both real-time sensor inputs and historical records accessible to diverse audiences. The platform creates visceral, spatially anchored experiences of projected environmental changes, translating abstract measurements into tangible visualizations that facilitate informed decision-making among community members, policymakers, and scientists.[37] The project demonstrates how spatial computing transforms public engagement with environmental issues while leveraging datasets collected through complementary participatory sensing networks.[38]

Figure 3. In Deep Water Mixed Reality Interface: Visualization of NOAA sea level rise projections for Miami within a spatial computing environment, integrating user surveys, community narratives, and real-time environmental data to promote climate literacy and civic engagement.

The technological foundation employs the HoloLens 2 MR platform to visualize real-time sensor data within physical environments. The system integrates NOAA sea-level rise projections into dynamic simulations that users interact with in familiar locations. Advanced eye-tracking and interactive elements encourage active exploration of environmental data rather than passive consumption. The platform incorporates GIS data with real-time water sensor networks, allowing visualizations to reflect current environmental conditions alongside future projections This fusion of digital information with physical space creates a hybridized environmental literacy that democratizes access to complex environmental data previously confined to technical reports – as illustrated in Figure 3.

The user experience begins with participants standing before a high-resolution map of Miami. After donning the HoloLens 2, users complete a calibration process and an environmental literacy survey within the MR environment. The core interactive experience reveals a 3D map of Miami with four interactive pathways: sea-level rise projections, real-time sensor data, Miami River information, and community stories from residents affected by urban water issues. This integration of technical data with personal narratives creates a holistic understanding of environmental challenges, bridging objective measurements with subjective experiences.

Engagement with In Deep Water, involving 200 participants across Miami and Los Angeles, yielded compelling outcomes. The diverse participant group included scientists, designers, artists, politicians, and the general public. Participants demonstrated increased interest in urban water issues and greater willingness to engage in environmental efforts after experiencing the immersive presentation. Miami residents showed significantly longer interaction times, suggesting that personal connection to place enhances engagement with environmental data. A key finding revealed a positive correlation between interaction with technical sensor data and subsequent engagement with community stories, indicating that the platform successfully bridges scientific and narrative approaches to environmental understanding. The project demonstrates how immersive technologies can complement traditional environmental engagement styles while making environmental data accessible to broader audiences.[39]

CHALLENGES AND OPPORTUNITIES IN IMPLEMENTING PSNS

Technical Barriers

The deployment of PSNs faces several technical hurdles, including sensor calibration and long-term maintenance. Community-deployed sensors often experience drift, necessitating periodic recalibration, which may exceed the technical capacity of participants.[40] Without consistent maintenance protocols, data quality can degrade, undermining the reliability of citizen-generated environmental information. Additionally, variations in environmental conditions—such as temperature, or pollution levels—can impact sensor performance, requiring site-specific adaptations.[41]

Standardization and interoperability issues present further obstacles. The diverse hardware and software ecosystems within different PSN initiatives often result in incompatible data formats and communication protocols. This lack of uniformity complicates large-scale data integration, limiting the potential for comparative analysis across different projects or geographic regions. The absence of common frameworks for data collection and sharing also raises concerns about scalability and sustainability.[42] Another major challenge is scaling low-cost monitoring tools for diverse urban environments. While affordable sensor technologies facilitate broad public participation, their effectiveness varies across different environmental contexts. In addition, the economics of producing and distributing cost-effective environmental sensors at scale remains difficult, particularly for community-led or academic initiatives with limited resources.[43] Ensuring financial sustainability, while maintaining affordability and accessibility, is critical for long-term adoption.

Social & Governance Barriers

Beyond technical challenges, PSNs face significant social and governance barriers that affect adoption and long-term impact. Sustaining public participation after initial enthusiasm is difficult, as engagement often declines without ongoing coordination, feedback mechanisms, and clear evidence that citizen-collected data drives meaningful action.[44] Without these elements, participation wanes, undermining the decentralized sensing model that gives PSNs their value. Successful implementation requires technological systems that foster community engagement and reinforce civic responsibility.

The digital divide further limits equitable participation, as marginalized communities often lack access to digital devices, reliable internet, and technological literacy.[45] This disparity is especially

concerning, as these communities are frequently the most vulnerable to environmental risks and would benefit most from improved monitoring and early warning systems. Addressing these inequities is essential to ensuring PSNs do not unintentionally reinforce existing social disparities.

Policy integration also presents challenges, as government agencies often resist incorporating community-generated data into official environmental monitoring frameworks due to concerns over data quality and reliability.[46] Many agencies rely on established protocols that do not readily accommodate citizen science, making institutional change necessary. Developing governance models that validate diverse data sources while maintaining scientific rigor is crucial. These frameworks must also address data ownership, privacy, and public access to environmental information to ensure participatory technologies contribute meaningfully to environmental governance.[47]

FUTURE PROSPECTS AND CONCLUSION

Despite challenges facing Public Sensor Networks, digital coastal governance offers significant opportunities through three key developments: 1) AI-powered predictive analytics, which integrates community-collected data with advanced modeling to improve environmental forecasting. The SMARTblox project exemplifies this approach by using AI-driven parametric design and real-time sensor networks to optimize coastal infrastructure and monitor water quality, demonstrating how computational power can be leveraged for adaptive environmental management; 2) Immersive media technologies can enhance environmental literacy by making environmental data interactive and accessible. The In Deep Water project showcases how spatial experiences can strengthen connections to place, transforming abstract environmental data into tangible and engaging narratives; and 3) Cross-sector collaborations between academia, government, and technology partners help address resource limitations and create more resilient governance systems. While still in testing, Water Wand represents a model for participatory environmental sensing, engaging communities in water quality monitoring and laying the groundwork for future integration into resilience planning.

By integrating architecture and urban design, spatial computing, physical computing, immersive media, and environmental science, these projects demonstrate the transformative potential of PSNs in environmental engagement and governance. They empower communities, shifting them from passive observers to active contributors in knowledge creation, while expanding public participation in coastal management. However, to fully realize this potential, challenges related to data quality, interoperability, digital equity, and policy integration must be addressed. As PSNs evolve and incorporate emerging technologies, they offer a scalable framework for inclusive civic engagement and reshaping how communities interact with and steward their coastal environments.

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REDEFINING SPACES: IMMERSIVE STORYTELLING THROUGH MULTI-SCREEN MEDIA AND SPATIAL SOUND – A CASE STUDY OF LAMENTATION AT THE LIESBEEK

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INTRODUCTION

The *Lamentation at the Liesbeek*[1] installation is an interdisciplinary project that integrates visual, auditory, and interactive elements to reimagine historical and cultural narratives. Developed collaboratively by faculty and students from Arizona State University's Media and Immersive eXperience (MIX) Center, including Creative Directors Micha Espinosa and Sara Matchett, alongside South African community leaders, artists, and scholars, the project immerses audiences in the contested history of Cape Town's Liesbeek River. Members of the project team, who contributed to both the conceptualization and execution of the installation, also serve as the authors of this study, providing a first-hand perspective on its development. Inspired by the co-designed art documentary[2] of the same name, the installation leverages spatial sound and screens that envelop the audience with themes of Indigenous storytelling, memory, and cultural resilience.

At the core of the installation is a documented performance of 'artivism' and sonic activism, reconceptualizing ancient Khoisan oral traditions and ritualistic chants performed along the Liesbeek River. These elements are re-contextualized through advanced immersive media technologies that enable designers to recreate the tensions and sonic properties of historical environments and contested spaces, while place victors in a visual representation of the landscape. The multisensory experience allows visitors not only to hear but to perceive and interact with sound and landscapes, offering an embodied engagement with the reverberations of history, identity, and resilience. By intertwining auditory, visual, and historical elements of these sacred sites, *Lamentation at the Liesbeek* transforms physical space into a medium for remembrance and dialogue.

This project addresses a critical question: how can immersive media installations, through the intertwined dynamics of visual and sonic elements, serve as dialogic mechanisms that foster new conversations, social awareness, activism, cultural memory, and decolonial narratives? By positioning immersive storytelling as a method of critical engagement, *Lamentation at the Liesbeek* seeks to challenge historical erasure, amplify Indigenous voices, and create redefined participatory spaces for reflection and social transformation.

IMMERSIVE EXPERIENCE DESIGN

The *Lamentation at the Liesbeek* immersive installation was conceptualized as part of a transmedia event, where an art documentary was screened linearly in a Dolby Atmos[3] movie theater, while an interactive installation was simultaneously presented in the Enhanced Immersion Studio—a three-story, 3,200-square-foot performance space (Figure 1). Both venues are located at Arizona State University's Media and Immersive eXperience (MIX) Center[4] in Mesa, AZ, USA. The documentary familiarized the audience with the story of the contested land and its overarching narrative, while the installation, structured around a poem written by South African collaborators, deepened engagement through sonorization of words and non-verbal sounds, offering an embodied and multisensory experience connected to the local narratives and contested land.

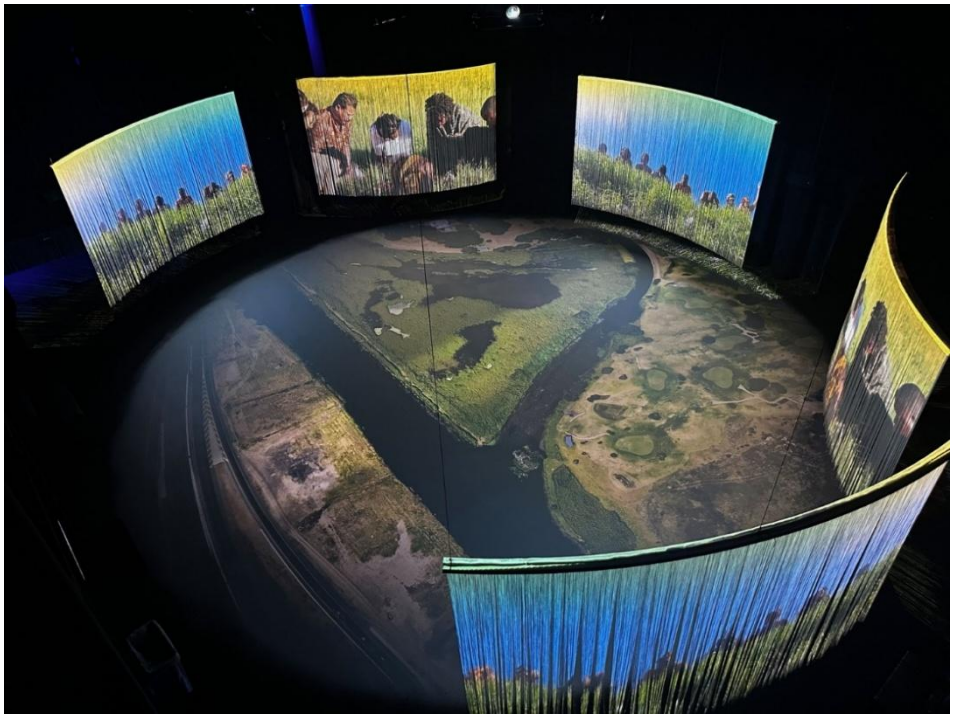

Figure 1. Lamentation at the Liesbeek Installation at ASU's Enhanced Immersion Studio

However, designing an immersive experience presents conceptual challenges, especially at a time when the term "immersive" has increasingly become a commodity. Historically, media developments such as the Sony's Walkman[5] were considered immersive innovations. But what defines an immersive experience, and how can it be systematically designed?

Immersive media has been theorized in various ways. Some scholars define immersion as a state of deep involvement achieved through sensory stimuli, interactivity, and presence. Others consider it an emotional or psychological state fostered by spatial and temporal design elements[6]. Despite these perspectives, there remains a lack of a standardized framework for immersive experience design.

Hyunkook Lee[7] proposes a conceptual model of immersive experience in extended reality (XR), wherein immersion emerges from three primary attributes: physical presence, social/self-presence, and involvement. Each attribute is shaped by sensory, narrative, or task/motor engagement. Additionally, plausibility, interactivity, and interestingness define the immersive system, influenced by subjective factors such as prior knowledge and personal preference. This framework provides a structured methodology applicable to installations such as *Lamentation at the Liesbeek*.

Bridging these perspectives, the installation is designed as an environmental and perceptual engagement, guiding audiences through an experience that combines documentary representation with

spatialized storytelling. This approach fosters interaction between personal memory, place, and cultural identity.

Approaching Immersion and Sensory Experience in the Installation

In reconstructing the experience of historic and sacred places of worship, particularly within the South African context of the Liesbeek River, the design process was grounded in creating a multi-sensory environment. Drawing from the theoretical frameworks of perception and embodiment[8] (Merleau-Ponty) and spatial design[9] (Bachelard), we sought to blend the sensory, imaginative, and fictional elements of the site with a deeply rooted narrative experience. Immersion in this case is not only auditory but also perceptual and environmental, engaging the body, mind, and emotions in a layered interaction with space.

The Sonic Canvas

To effectively involve audiences and facilitate meaningful interaction, sound design—despite its potential for aesthetic innovation—requires grounding in a familiar sensory framework. Building on research that examines how immersive sound design can alter audience perception and emotional engagement,[10] the project employs spatialized audio to deepen the listener's embodied experience, transforming sound into an active agent of historical and cultural resonance.

The process began in pre-production with deep listening to the location audio material from the documentary (dailies), including field recordings and an additional curated list aimed at capturing authentic environmental sounds. These included water, birds, rituals, and ambient noises such as distant traffic and construction on the sacred land, representing the sonic tensions embedded within both the environment and the broader political situation. These recordings laid the foundation for the sound design, reflecting both the lived experience of the space and its ritualistic significance.

In sound editing and mixing, this material was shaped through spatial mapping, layering, and dynamic sound trajectories within the installation space, guided by object-based audio principles. The use of a 55-speaker system organized in four layers and custom spatial subsets ensured that sound not only enveloped the audience but also moved within the space in real-time, mirroring the ebb and flow of the river itself. This movement of sound was further documented and reflected across the five custom projection surfaces, reinforcing the installation's evolving transformation.

The Imagetic Canvas

The visual elements were carefully designed to complement the sonic experience. The five projection screens, each with a unique shape, were arranged to resemble the meandering flow of a river, reinforcing the geographical confluence of the Black River and the Liesbeek River in Cape Town (Figure 2). In addition to the surrounding screens, the site's actual location was projected onto the floor, allowing the audience to symbolically stand on the land that inspired and drives the experience.

The moving material of the screens in *Lamentation at the Liesbeek* shares similarities with object-based sound installations discussed by Ethan Rose,[11] as both integrate physical elements to enhance the sensory experience. Just as Steven Reich's *Pendulum Music*[12] used swinging microphones to make sound generation visible and interactive in 1968, the fabric screens in *Lamentation* create a direct connection between the audience and the environment, allowing them to visually and physically engage with the flow of the Liesbeek River. Both installations emphasize movement—Reich through swinging microphones and *Lamentation* through soft, movable fabric elements—inviting viewers to experience the physicality of sound and space. Similarly, Alvin Lucier's *Music on a Long Thin Wire*[13] and Zimoun's *80 Prepared DC-Motors*[14] explore the relationship between sound and physical objects, much like the fabric screens in *Lamentation*, which symbolize the river's dynamic movement.

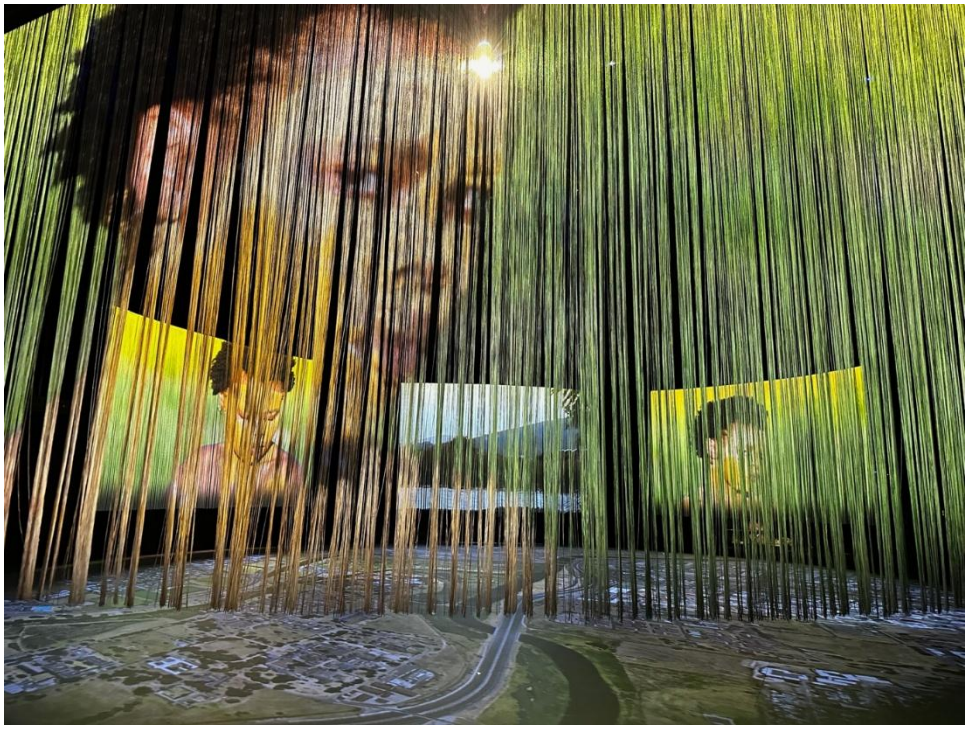

Figure 2. Custom-made projection screens

Sound-Driven Design Process

The relationship between sound and visual elements is central to this project, reversing the conventional approach by beginning with sound rather than image. This sound-driven methodology serves to establish the structure of the experience, fostering a deeper connection between sensory and emotional aspects of the work. In this sense, *Lamentation at the Liesbeek* resonates with Le Corbusier's *Poème Électronique*[15], which combined spatialized sound by Edgar Varèse, visual projections, and architectural design within the Philips Pavilion, offering an immersive experience that explored the intersection of modern technology, art, and human expression. By leveraging contemporary technological possibilities, *Lamentation at the Liesbeek* integrates spatial audio and multimedia elements to transform physical and conceptual spaces into arenas for cultural reflection and storytelling.

From Sound to Image

The creative process for the visual design started with the decision to use a poem. This poem is a condensed verbal expression of the complex weave of feelings, thoughts, and emotions experienced by the Khoisan at the site. It serves as a verbal narrative and an initial structure for sequencing the visuals. As viewers are surrounded by five screens rather than a single screen, we had the opportunity to offer the audience an experience that is self-curated depending on their location and orientation. Imagery is sequenced with a focus on emotional impact, emphasis, and illustration. As a result, the screens may all show the same image, entirely different images, complementary images of the same subjects, or a symmetrical arrangement with a central main screen as the focal point. The initial visual sequence, which includes deliberate gaps, serves as a visual guide for the sonic experience at the beginning of the process. The absence of visual information at specific moments is an intentional choice to allow the audience to listen and see with their imagination. Thus, the installation starts with a poem, setting the tone for a narrative that evolves through sound.

From Place to Sound

As discussed on sonic art, "sound-objects should be seen as totalities or gestalts".[16] This perspective allows us to understand the transformations and resonance of sound objects, which evolve over time, both qualitatively and in their impact on the audience. In turn, the system of sound production and playback, including field recordings of local sounds, supports the creation of immersive experiences that evolve dynamically with the environment. This involves immersing ourselves as artists and audience in the natural soundscape and the Khoisan voices, observing both environmental sounds and their structural interactions. The art of organizing sound—its events in time—forms the backbone of sonic art, where sound is not merely a background but an active agent in shaping perception.

Musique concrète techniques also inform the creative process, using a vocabulary of sound objects categorized by phenomenological properties. These sounds are manipulated using techniques like spatial panning, but without reference to a notated score.

OPPORTUNITIES IN TECHNOLOGY

The technical aspects of the installation include Meyer Sound's Spacemap Go NADIA[17] 55-speaker, four-layer, object-based audio system, which utilizes spatial maps to create custom-designed subsets of space or to serve as a dynamic canvas for locating and moving point sources. This setup enables the production of evolving sound trajectories throughout the environment. Complementing this audio system are five custom projection screens that wrap around the audience, fostering a fully responsive and immersive atmosphere. A Pixera media server playback system sequences the visuals, maps them to the custom screens, routes seven channels of video (five for the surrounding screens and one for the floor projection), and synchronizes the visuals with the auditory landscape.

The interaction between sound and visuals creates a deeply immersive experience, where spatial audio and imagery remain coherent regardless of a visitor's location within the space. This synthesis evokes real-world spatial dynamics, enhancing the sense of physical and historical presence within the installation.

Spatialization in Immersive Systems

A key feature of this installation's design is its use of spatial audio technology, allowing for precise control over sound placement and movement. The space mapping system enables manipulation of sound objects—such as environmental elements (e.g., fireflies, birds) and spoken poetry—across a multi-speaker array in real time. Each sound object follows a trajectory that can be designed or dynamically adjusted through tempo and direction.

Spacemap Go[18] technology facilitated the creation of customized panning for each sonic element, providing granular control over spatial placement (Figure 3). The system's nodes direct sound to specific loudspeakers, while virtual nodes add functions, such as fading, multi-directional routing, offering dynamic interaction with the projected visuals. With five screens in the room, the design of spatial subsets allowed for multi-layered sonic composition. By crafting stereophonic mixes per screen that seamlessly integrate into the full immersive environment, the design team was able to optimize the audio production workflow to manipulate sound in ways that enhance audience engagement and spatial perception.

By leveraging these spatial audio techniques, the installation fosters an environment where sound is not static but continually evolving, inviting visitors to experience shifting sensory perspectives. The integration of object-based mixing and immersive routing technologies reinforces the notion that sound is not merely a supporting medium but an active co-creator of space.

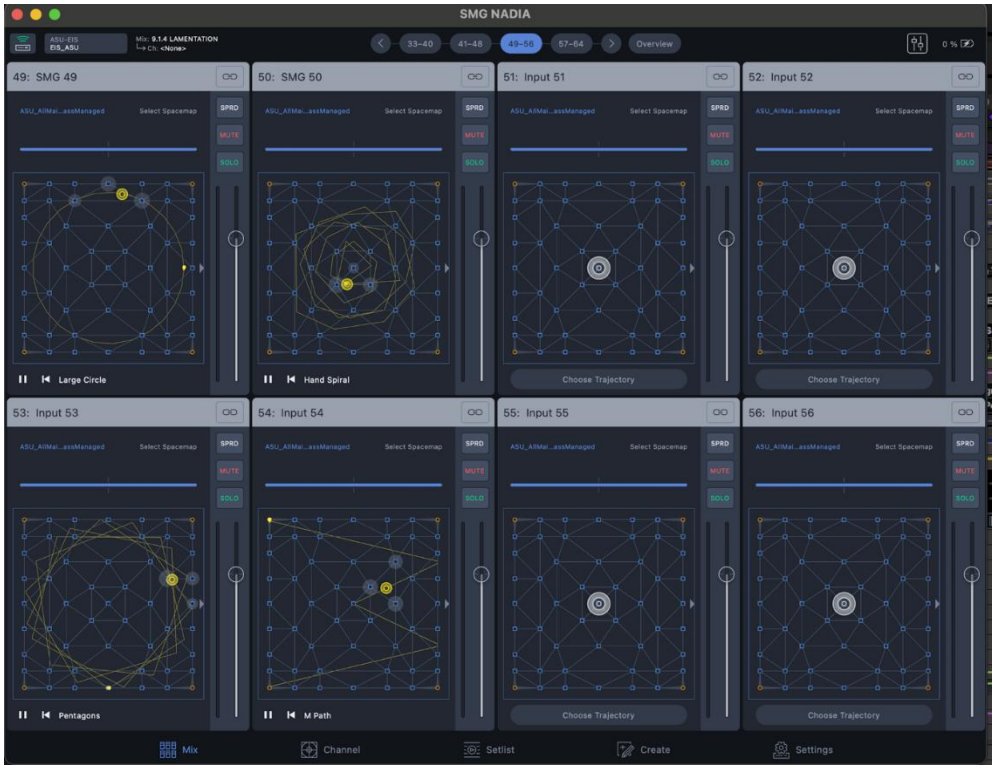

Figure 3. Spacemap Go software interface: object-based spatial audio and trajectories design.

Sound Design for Space and Embodiment

Sound serves as the foundation of the installation, amplifying unheard voices and engaging critically with historical narratives. From the poetic text's transformation into sound to the nuances of spoken voice and electroacoustic design, maintaining a connection to meaning, ancestry, and historical relevance was essential in ensuring immersive quality.

Filmmakers and Scholars Micha Espinosa and Sara Matchett emphasize that "sound cuts through the illusion that we're separate—sound travels through other realms and the body."[19] Their approach to sonic activism foregrounds voices that are often silenced, providing a platform where breath, voice, and embodied sound encourage social reflection and action.

In the sound design process (Figure 4), the narrated poems were meticulously edited for pacing and structure, with a slower performance tempo to evoke reflection and reverence. Breath sounds, emotionally performed by local artists and community members, were placed seamlessly at the end of some cycles, creating a continuous auditory presence. Additional elements—such as lamentations, cries, screams, and ritualistic chants recorded during the artivist performance at the Liesbeek River—were interwoven spatially to construct an immersive sonic atmosphere. These sonic layers were essential in crafting an environment where the soundscape blended naturally with the voices and narrative, reinforcing the sense of space as an active, evolving entity.

Figure 4. Sound Editing Process (Pre-Production) in Pro Tools, layering multi-dimensional elements.

The Role of Motion and Spatial Audio

Chion[20] argues that sound is intrinsically tied to movement, shaping our perception of space and action. He highlights how sound often signals motion or transformation, contrasting with visual elements that may remain static while still conveying meaning. This distinction is critical in designing sound environments that interact with the audience dynamically.

Technology provided a flexible platform for precise manipulation of sound in three-dimensional space. This capability extends Chion's concept, allowing for sound to exist not only in fixed positions but to travel dynamically, generating layers of nested sonic spaces. This way of approaching space also reduces common audio issues such as frequency masking and over-reliance on equalization and compression, which are often necessary in conventional stereo playback systems.

Through spatial audio techniques, the installation achieves more than just an immersive sonic experience—it creates a dynamic, ever-evolving environment that mirrors the movement of the river and the emotions it evokes. Rather than serving as a passive background element, sound actively co-constructs the space, reinforcing the installation's themes of history, resilience, and memory.

SPACE AND THE POETICS OF SPACE

The installation also engages with the concepts outlined in *The Poetics of Space,*[21] particularly how imagination imbues space with meaning and spirit. Bachelard's exploration of how architecture and spatial structures evoke feeling, memory, and fantasy in the occupant's imagination is central to our understanding of how sound interacts with space. In this context, sound does not merely occupy space; it transforms it into an experiential and imaginative realm.

Sound as a mediator

Bachelard's distinction between interior and exterior spaces[22] provides a useful framework for analyzing the interplay of sound and the physical environment in the installation. Here, sound acts as a mediator between perception and memory, dynamically shaping and being shaped by the audience's movement. As visitors traverse the installation, their perception of sound shifts, creating a sensory engagement that echoes Bachelard's notion of the interior as a reflective, deeply imaginative space.

The act of walking, as Bachelard describes it, becomes a form of linguistic expression. Through movement, individuals decode and recode the symbols of their surroundings, crafting a personal

language of urban or environmental experience. Similarly, in this installation, the act of traversing space becomes a form of interaction with both the soundscape and visual environment, allowing each visitor to experience a unique and evolving interpretation of the work.

Dunaway[23] underscores the critical role of field recording in preserving oral histories across cultures. These recordings are essential to numerous disciplines, including anthropology (cultural practices), folklore (oral narratives), ethnomusicology (musical analysis), linguistics (language documentation), gerontology (oral histories of aging), and geography (local and environmental histories). The *Lamentation at the Liesbeek* project has actively contributed to advancing oral history as a practice on an international scale.

The click symphony

Beyond field recordings, sound plays a crucial role in this installation as a medium for memory, identity, and decolonization. The Khoi people of South Africa traditionally spoke a click language known as Khoekhoe, a part of the Khoisan language family, which is characterized by its extensive use of click consonants. These clicks are a defining feature of Khoekhoe phonetics, setting it apart from many other linguistic families worldwide. However, like many Indigenous languages, Khoekhoe is at risk of extinction due to the declining number of native speakers.

As part of an effort to preserve, memorialize, and revitalize the language, *Lamentation at the Liesbeek* features multiple recordings of Khoekhoe click sounds, performed in a diverse range of expressions under the direction of Khoi Leader and human rights defender Tauriq Jenkins. Through his conceptual approach, these sounds were transformed into a spatialized auditory experience, referred to as a "click symphony." At this moment in the installation, the visual elements fade, leaving only the fluid imagery of the river's surface, reinforcing the immersive experience of sound, image, and space as instruments of cultural reflection.

This creative process aligns with Gautier's "recycling audibility" concept,[24] which argues that sound preservation should move beyond passive archival practices and instead engage the voices of Indigenous communities as active agents in sonic creation. Rather than treating Khoekhoe clicks as historical remnants, Jenkins and Matchett's leadership ensured that these sonic elements were recontextualized as living cultural expressions within the installation, reinforcing a decolonial approach to sound and memory.

CONCLUSION

The *Lamentation at the Liesbeek* installation exemplifies how immersive media can function as a powerful tool for cultural memory, social engagement, and decolonial praxis. By integrating sound design principles, spatial mapping techniques, and interdisciplinary theoretical frameworks, the installation provided a multi-sensory experience of the Liesbeek River as a site of activism, contested history, spirituality, and environmental transformation. Rather than merely recreating the sonic and visual aspects of the river, the installation fostered an embodied encounter in which audiences navigated a layered environment of auditory, visual, and emotional stimuli.

The deliberate fusion of field recordings, oral histories, ritualistic chants, and spatialized sound positioned the river not as a static artifact but as a living, evolving site of remembrance and resistance. This approach resonates with López-Yánez and Saavedra Calderón's argument that sound artworks can reclaim and activate public spaces through collective memory and historical counter-narratives.[25] Much like their exploration of Afro-Ecuadorian musical traditions as decolonial acts, *Lamentation at the Liesbeek* reconstructs sonic landscapes to sustain cultural identities and challenge colonial erasure. By placing audiences within an evolving interplay of sound, image, and movement, the installation underscores the significance of sensory perception in shaping our understanding of place and cultural

resilience. It demonstrates how immersive media can serve as a site for both historical reflection and contemporary activism, transforming physical and conceptual spaces into arenas for cultural agency. Ultimately, *Lamentation at the Liesbeek* highlights the role of immersive installations as dialogic spaces where artistic expression and technological innovation converge to amplify marginalized voices, challenge historical erasure, and reimagine collective narratives for present and future generations.

NOTES

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AMPS PROCEEDINGS SERIES 41

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