STORIES WITHOUT AN AUTHOR

Co-Creation
Beyond the Human

Jeroen Zwaap

STORIES WITHOUT AN AUTHOR

Co-Creation
Beyond the Human

Jeroen Zwaap

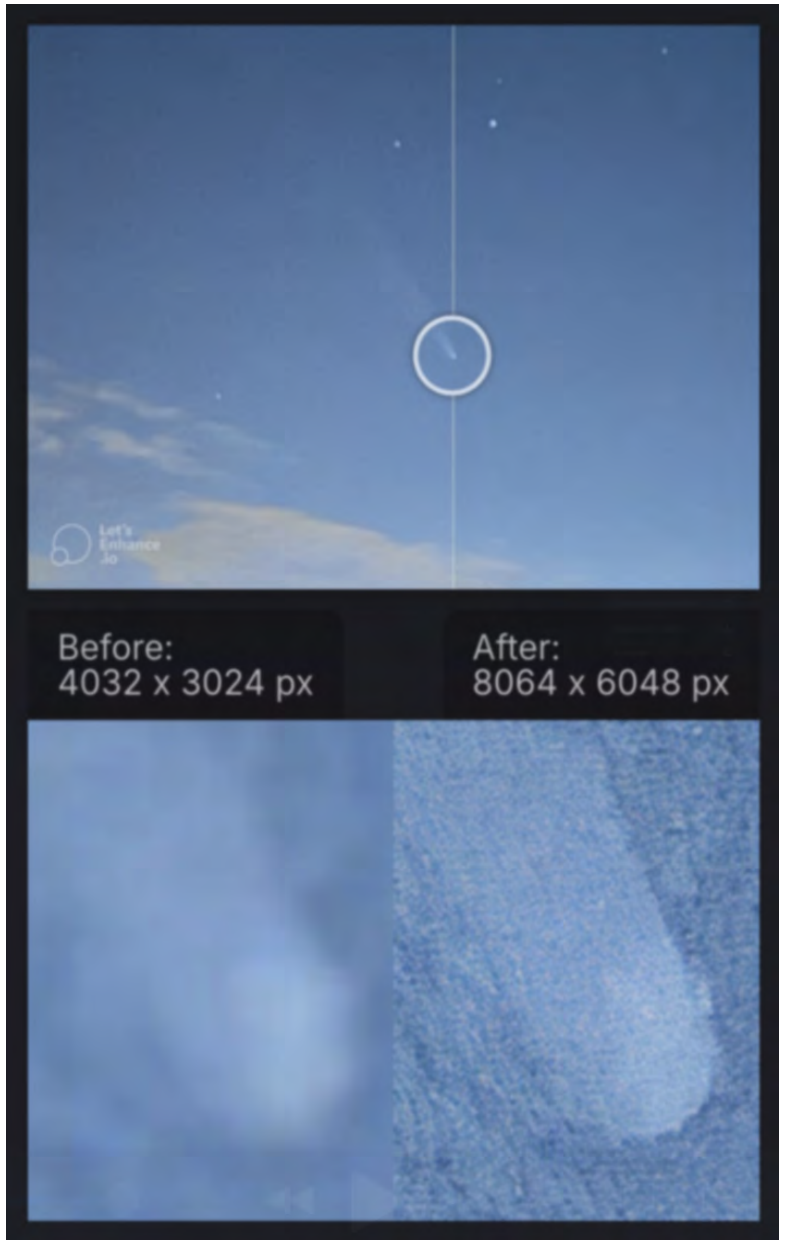
ABSTRACT

This thesis investigates how narrative agency can emerge collaboratively between human, technological, and more-than-human agents within artistic research. In response to the limitations of anthropocentric storytelling, it poses the central question: How does narrative agency emerge in co-creative processes involving human, technological, and more-than-human forces?

The research adopts an experimental, site-specific methodology grounded in transduction—the translation of one form of data or energy into another—to engage with the expressive capacities of more-than-human entities. Three iterations form the core of the investigation: a photogrammetric and sonic exploration of De Nieuwe Passage (The Hague), a real-time collaboration with storm Conall in a city forest, and a durational transduction of Tokyo's soundscape into photographic form. In each case, technologies such as cameras, code, and sensors are treated not as neutral tools, but as hybrid agents participating in narrative formation.

The results demonstrate that narrative meaning can emerge through intra-active, multisensory processes rather than through fixed representation. Each experiment reveals how environmental and technological agents shape the unfolding of story, whether through the rhythm of human flows, the shifting forces of weather, or the temporal layers of urban sound.

This thesis concludes that artistic research can facilitate non-anthropocentric storytelling by creating conditions for narrative to arise through entangled relations. It recommends a methodological shift toward collaborative, sensory-based practices that decenter the human artist and embrace the co-authorship of technological and environmental systems.



I

Creating Storyscapes Across Time

I sit in a clearing in the woods, with an open view of the western celestial skies. The diminishing sunlight rests momentarily on the horizon. The tree lines have become pitch black, and ravens gather loudly in the treetops. It is the transitional time when one part of the forest goes to sleep while another awakens. The air, still warm between the trees, hums with an energy that feels shared among us all.

It is 6:30 PM, October 16th, 2024. Tonight, I hope to catch a glimpse of Tsuchinshan-ATLAS, the comet discovered in early 2023. Based on its current orbit, the comet last passed through the inner solar system approximately 80,000 years ago, placing its previous visit in the Paleolithic era—roughly ten to fifteen thousand human generations ago. Some speculate that the comet may be ejected from the solar system entirely due to gravitational interactions, possibly never to return. Its story unfolds in the vastness of space and time, yet tonight, our stories might briefly intersect.

As the last ravens fall silent and the contours of the trees fade into darkness, I imagine a Paleolithic boy looking up at a faint but foreign light in an otherwise familiar night sky. I think of strange languages around warm fires, stories triggered by the comet's appearance, shaping and giving meaning to the observable world. The comet's presence transcends both of us—its passage a reminder of deeper rhythms that connect us, existing regardless of our place in time.

The imagined easily transitions into the remembered. I am lying on my back in cold, wet grass, hands folded under my head. I am about five or six years old. The winter sky is pitch black, but the silver moon casts shadows on the field. Next to me lies my stepdad. „There is somet-

hing special about tonight," he told me after dinner. As we look up, he tells stories about the moon, the sun, and other planets. With all my might, I try to grasp the scale of these stories. „Humans have walked on the moon," he says. We remain silent for a while. Then my stepfather points at the moon. „Look!" he says, „It has begun." I see a shadow, the color of dried blood, partly covering the moon. Over the next few minutes, the moon gradually dims into a dirt-red presence, and then slowly transforms back into a silver disc.

This encounter with an eclipse profoundly shaped my childhood legendarium: an amalgam of book knowledge, mythical stories, and magical thinking. A storied universe where the boundaries between the real and imagined, between knowing and sensing, between human and more-than-human, were always porous.

I remember tying rubber bands between the branches of a tree, turning the wind into a simple aeolian instrument. The wind played its own tune, making the air tangible in a way that felt collaborative, as if the world was speaking back. Later I would catch spiders only to release them in our back garden. In early autumn mornings, I would wake to find the garden draped in dew-drop-laden webs. These intricate architectures woven by tiny narrators changed the garden into a dreamlike spatial pocket. These fragments tell a narrative of early experiments.

With the intuitive understanding of a child, I sensed that the more-than-human world was alive with stories that didn't require my interpretation, but that I was invited to be a part of. These experiences taught me that our narratives are never solely ours; they emerge from the relationships we form with the world around us, with the wind, the spiders, the stars, and the comets. The world, in its energy, matter, and relations, is constantly telling its own story. I am simply part of that unfolding.

II

Unraveling Narrative Agency

Much of my childhood's narrative is embedded in interactions between me and the more-than-human world. From an early age, I understood, without the need for reflection, that storytelling is not the sole domain of human authorship. A story can be told by the moon, the wind, a tiny spider, or the stars themselves. These stories are rarely written or spoken in human language; instead, they emerge in a spectrum of expressions of movements, rhythms, changes in light and texture, the subtle interweaving of forces.

As a child, I did not question this porosity of storytelling, this entanglement of narrative agency and meaning-making: it was simply a given. But now, decades later, I ask: If stories arise through a multiplicity of voices, what does this mean for narrative itself? How does a story take shape when agency is not singular but shared? And how might artistic research create the conditions for narratives to emerge rather than be imposed?

These questions form the foundation of my research, leading to the central question of this thesis: How does narrative agency emerge collaboratively between human, technological, and more-than-human agents in my practice?

This question arises from a desire to move beyond human-centered notions of storytelling, seeking methodologies that recognize the agency of more-than-human entities. I aim to shift from modes of representation toward a more reciprocal exchange of meaning. From a mode where the environment is observed, translated, or appropriated to one where the world does not simply exist to be described but is given space to speak, and to be listened to.

A crucial aspect of this inquiry is investigating what

methodologies can facilitate co-creation across human, technological, and more-than-human agents. If storytelling is inherently relational, artistic research must develop approaches that account for these relations in practice. This research examines the role of transduction in revealing more-than-human narratives, exploring how sensory data can be translated across modalities to make these narratives perceptible.

Another key consideration is how different environments—natural, urban, computational—shape the ways narrative agency is distributed. Technology plays a mediating role in these interactions, forming and influencing relationships between agents while adding its own narratives to the stories. Additionally, this research explores artistic strategies that unsettle anthropocentric control over narrative-making. If an artistic researcher can act as a conduit rather than a sole author of meaning, it raises questions about how methodologies such as intra-action, material ecocriticism, and actor-network theory can offer alternative approaches to storytelling.

These questions are explored through artistic practice. The experiments undertaken are structured as site-specific collaborations, each engaging with a distinct environment to examine how narrative agency emerges in different conditions. Through these collaborations, I aim to investigate how meaning is generated not in isolation but through entangled, relational networks.

This inquiry is about seeking new ways of listening, perceiving, and responding; about attuning to the stories that already exist, waiting to be heard. It is an attempt to develop an artistic practice that does not impose meaning but invites it to emerge.

III

Theoretical Framework and Research Methods

1. Theory and Method as Entangled Processes

In this research, theoretical frameworks and research methods are deeply intertwined. The methodologies I employ—transduction, site-specific experimentation, and sensory translation—are directly informed by theoretical perspectives that challenge anthropocentric narrative structures. Instead of treating theory as a lens applied retrospectively, it operates as an active agent in shaping the research process itself. This chapter outlines the key conceptual frameworks that inform my research and demonstrates how they translate into artistic methodologies.

2. Expanding Narrative Agency

The conceptual foundation of this thesis draws upon four primary theoretical frameworks: Material Ecocriticism, Relational Ontology, Actor-Network Theory, and The Perception Machine. Together, these frameworks challenge conventional ideas of authorship, representation, and agency, proposing instead a model of storytelling as an emergent, relational process.

2.1 Storied Matter and Transduction

Material ecocriticism, as articulated by Iovino and Oppermann, posits that matter is not inert but storied—imbued with histories, agency, and expressive potential.[1] This framework challenges anthropocentric

[1] Serenella Iovino and Serpil Oppermann, eds., Material Ecocriticism (Bloomington: Indiana University Press, 2014), 29-31.

storytelling by asserting that landscapes, weather systems, architectures, and technologies co-create meaning through their material presence. Rather than viewing matter as a passive object awaiting human interpretation, material ecocriticism invites us to understand it as an active participant in shaping narrative.[2]

Transduction offers a methodological response to this perspective. It refers to the transformation of one form of energy, data, or expression into another. Rather than relying on human-centered representation, transduction enables relational, multisensory engagements with storied matter. Meaning is not extracted but emerges in real time through intra-active processes between human, technological, and more-than-human forces. This aligns with posthumanist thought, which resists the assumption that knowledge must conform to human sign systems, emphasizing instead embodied and situated experiences.[3]

In this inquiry, transduction acts as a bridge—amplifying the storied nature of matter by making it perceptible through new modalities. Whether converting movement into sound or sonic frequency into image, transduction facilitates co-creation by allowing matter to participate in meaning-making across sensory registers.

2.2 Actor-Network Theory and Relational Ontology

Both Actor-Network Theory (ANT)[4] and Relational Ontology challenge the notion of discrete, autonomous entities by focusing on how agency arises through networks and relations.

ANT, developed by Bruno Latour, asserts that agency is not the sole property of humans but is distributed among actants—human and nonhuman—that interact within dynamic networks. Rather than treating technology as a neutral tool, ANT sees technological systems, infrastructures, and ecological forces as co-constructors of narrative and meaning. Agency emerges from translation processes, where actants influence each other and shift the direction of interactions.

Relational ontology, particularly through Karen Barad's concept of intra-action[5], pushes this further by challenging the idea of pre-existing entities altogether. In this view, agency does not precede interaction but is the result of it. Entities materialize through their relations, and meaning arises through the entanglement of these forces. In contrast to ANT's emphasis on mapping networks, relational ontology emphasizes the transformative power of the relations themselves.

Taken together, these frameworks inform the methodology of this research. They help understand artistic practice not as the expression of an individual author but as a space of co-constituted agency. Whether tracing connections between camera systems, environmental rhythms, or weather patterns, or attending to the intra-active emergence of meaning in a storm or soundscape, this thesis draws on both ANT and relational ontology to articulate how narrative becomes a distributed and emergent process.

2.3 Mediation and the Perception Machine

Joanna Zylinska's concept of the "Perception Machine" reframes technological mediation not as a neutral act of capturing reality, but as an active process of constructing it. Cameras, sensors, and computational systems filter, transform, and structure sensory input, shaping what is visible, audible, and legible.[6] Zylinska expands on

[2] "Material Ecocriticism and the Creativity of Storied Matter." Frame. Vol. 26–2, 55–57
[3] Rosi Braidotti, The Posthuman (Cambridge: Polity Press, 2013), 2.
[4] Bruno Latour, Reassembling the Social: An Introduction to Actor-Network-Theory (Oxford: Oxford University Press, 2005).
[5] Karen Barad, Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning (Durham, NC: Duke University Press, 2007), 33
[6] Joanna Zylinska, The Perception Machine: Our Photographic Future Between the Eye and AI (London: Open Humanities Press, 2019), 129

Flusser's idea that cameras encode specific ways of seeing, emphasizing that all perception is technologically conditioned.[7]

This perspective resonates with Barad's agential realism[8], which suggests that observation is not passive reception but an active engagement where meaning materializes through specific intra-actions. Technological systems—whether photographic, algorithmic, or sonic—do not simply record phenomena; they co-produce them.

In the context of this research, the perception machine is not merely a tool but a participant in storytelling. It selects, amplifies, and omits, shaping the sensory fabric of the narrative. This understanding destabilizes traditional ideas of authorship and truth in photography, suggesting instead that photographic images emerge from entangled, multisensory, and multi-agent processes.

Zylinska's framework also opens space for more-than-human narratives to emerge within and through technological systems. If mediation is generative, not just descriptive, then technologies can help foreground the agencies of nonhuman actors by amplifying their presence in unfamiliar yet perceptible ways. This shifts the role of the artist from observer to facilitator—setting up conditions for stories to unfold through intra-actions rather than being imposed from a human-centered perspective.

[7] Vilém Flusser, Towards a Philosophy of Photography, trans. Anthony Mathews (London: Reaktion Books, 2000), 21-32
[8] Karen Barad, Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning (Durham, NC: Duke University Press, 2007), 140

3. From Theory to Artistic Experimentation: The Need for Small Practical Experiments

I soon realized that narrative agency, when distributed among human, technological, and more-than-human agents, could not be studied through detached observation alone. Instead, I needed to create conditions where these agents could intra-act, influencing and shaping each other in real time. Small, situated experiments provided a way to explore emergent narratives, allowing insights to develop through process rather than through predefined analytical categories.

The smallness and practicality of these experiments allowed for a highly responsive and adaptive approach. Working with low-threshold, mundane consumer technologies, I could act and react swiftly with local environments without being hindered by excessive planning or technical complexity. This enabled me to engage directly with the material conditions of each site, seeking dynamic, real-time interactions.

These experiments were designed as spontaneous encounters rather than controlled studies, allowing me to participate in the process of meaning-making without fully dictating the outcome. Each experiment functioned as a site of relational engagement, where agency was dynamically distributed among the elements involved.

3.1 How These Experiments Are Set Up

I identified that my research methodology is built on three primary methods, each informed by the theoretical frameworks introduced earlier:

3.1.1 Transduction as a Method

Transduction—the process of converting one form of sensory data into another—is at the heart of this research. By allowing more-than-human processes

to be translated into different sensory modalities, transduction provides a way to amplify the agency of more-than-human entities.

3.1.2 Technological Mediation

Technology plays an active role in these experiments, not as a neutral extension of human but as a co-creating agent. Each experiment is shaped by the interplay between human, technological, and environmental forces. By treating technological systems as narrative agents rather than tools, this research highlights how digital processes contribute to the co-creation of meaning.

3.1.3 Place-Based and Live Processes

Each experiment was conducted as a site-specific engagement, meaning that the methodologies were not applied uniformly but adapted to the unique conditions of each environment. The experiments emphasize live interactions, where meaning unfolds through real-time relational processes. Rather than imposing external narrative structures onto these spaces, the experiments sought to attune to the site's rhythms, allowing the emergent properties of the environment to shape the momentary outcome.

This colored ³D rendering of Artifact IMΔG³–⁴² reveals a fractured memory of De Nieuwe Passage, where algorithmic vision stitches together image scraps into a ghosted yet strangely coherent environment.

IV ITERATIONS: THREE EXPERIMENTS

1. Iteration 1: De Nieuwe Passage

1.1 De Nieuwe Passage

On a rainy October morning in 2024, I found myself walking through the corridors of De Nieuwe Passage, a modern shopping arcade in The Hague designed by architect Bernard Tschumi in 2005. Grey light fell through the expansive glass ceiling, casting geometric patterns onto marble floors. The vibrant greenery covering parts of the walls added a faux organic contrast to the steel and glass structure. This space, with its pristine façade and transitory rhythms, became the focus of my first experiment.

It was during Joanna Zylinska's four-day workshop that I made the decision to collaborate with De Nieuwe Passage. The workshop invited us to rethink photography as something more than representation, exploring concepts such as the "image envelope," the "perception machine," and the "body as a camera." Against the backdrop of this modern arcade, I began to explore how De Nieuwe Passage—a quintessential "nonplace" as defined by Marc Augé[9]—could transform into an active narrative agent.

1.2 Experiment Setup

I conducted two interconnected experiments in De Nieuwe Passage, each focusing on different layers of mediation.

[9] Marc Augé, Non-Places: Introduction to an Anthropology of Supermodernity, trans. John Howe (London: Verso, 1995), 78.

In the first, a phone-camera was attached to my jacket, forming a hybrid body-camera entity. As I walked through the arcade, the camera operated autonomously, capturing images based on my body's movement without direct human control. These images were processed with Polycam, a photogrammetry app, to create a three-dimensional digital model of the arcade. The algorithm filtered out transient human figures while emphasizing architectural structures, reinforcing certain narrative elements while erasing others.

The second experiment focused on the real-time transduction of movement into sound. A laptop was positioned at a fixed point in the arcade, its camera continuously capturing video.

A custom code analyzed differences in brightness between frames, storing them in two buffers—short-term for immediate fluctuations and long-term for sustained patterns. These rhythms were translated into a layered soundscape using two oscillators: one for a heartbeat-like pulse and another for ambient hums, creating a drone reflecting the space's dynamic flows.

1.3 Key Narrative Dynamics

Narrative dynamics highlight how specific forces, agents, or conditions actively shape the emergence of narrative within each experiment. This section identifies the central organizing forces at play. These dynamics foreground the more-than-human and environmental participation in storytelling.

→De Nieuwe Passage

The arcade actively shaped interactions through its architectural features, directing movement and influencing the camera's input. Its structured flows, and spatial organization created pathways that directed the movement of visitors and, by extension, the body-camera entity. The arcade's structural permanence contrasted with the ephemerality of human presence, introducing a narrative tension between stability and transience.

→The Body-Camera Entity

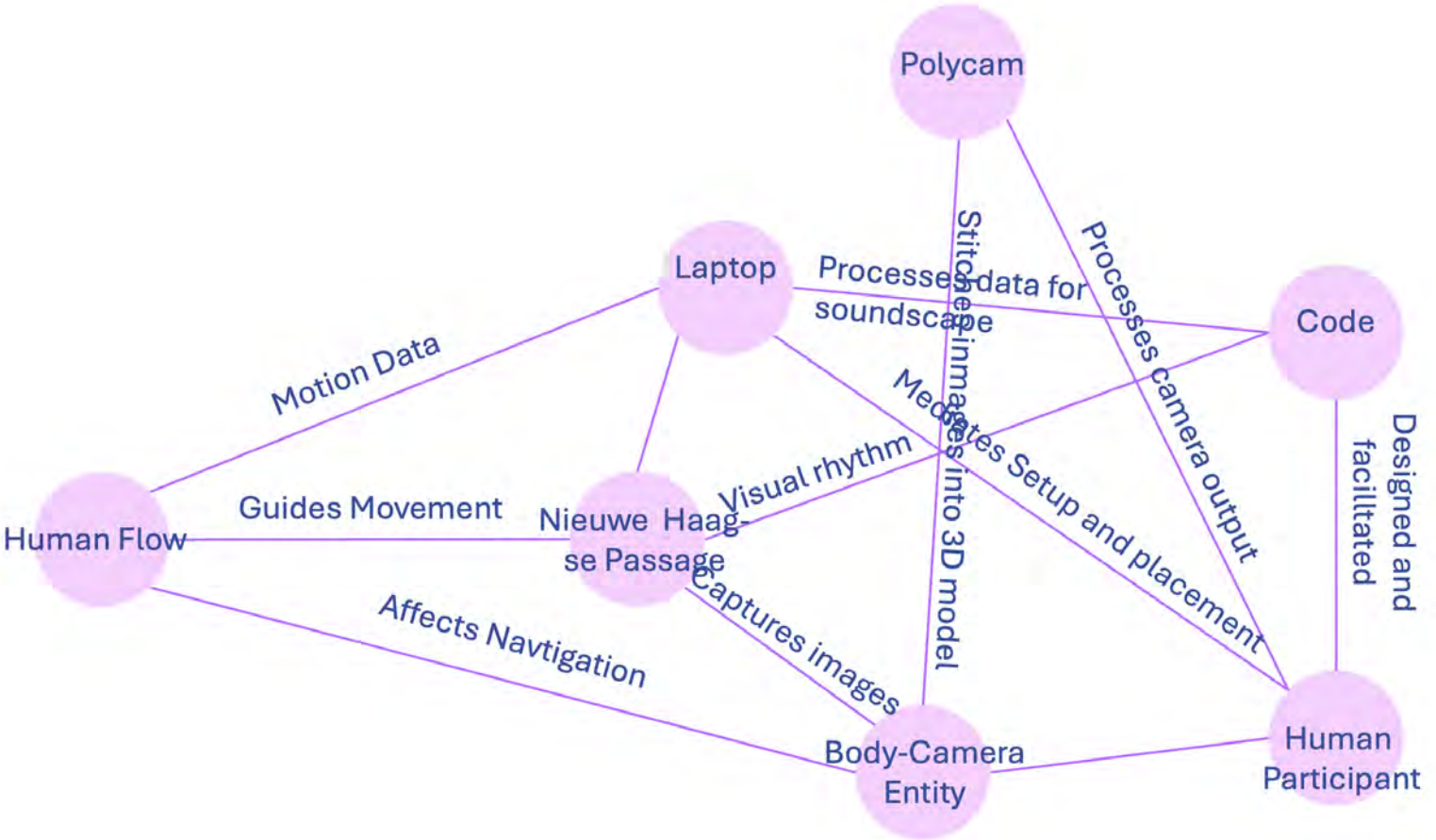
The phone-camera functioned not as a passive recording device but as part of a hybrid narrative agent that combined human and technological agency. My tendency to avoid crowds determined which areas were documented, revealing how narrative agency emerged through this entangled relationship rather than through deliberate compositional choices.

The Polycam app further extended this agency network, applying its algorithmic logic to exclude transient human figures while emphasizing the arcade's enduring architectural elements. This computational selection reinforced certain narrative elements while erasing others, demonstrating how technological mediation actively shapes storytelling.

→The Laptop-Camera-Code System

In the movement-transduction experiment, the laptop functioned as a compounded narrative agent, integrating hardware and software to mediate environmental rhythms. Positioned at a fixed vantage point, its camera captured variations in brightness caused by movement, reflections, and light shifts.

The code processed this visual data through an algorithmic lens, identifying rhythmic patterns and translating them into a drone-like soundscape. This process not only transduced environmental phenomena into auditory form but also introduced a computational layer of interpretation that determined which aspects of the visual field became audible.


Polycam
Laptop
Code
Human Flow
Nieuwe Haag-
se Passage
Body-Camera
Entity
Human
Participant
Motion Data
Processes data for
soundscape
Stitches images
Processes camera output
Designed and
facilitated
Guides Movement
Visual rhythm
Models into 3D model
Creates Setup and placement
Affects Navtigation
Captures images

COSTES

→Human Flow

Rather than focusing on individual actions, the collective movement of visitors operated as a systemic narrative force. Fluctuations in visitor density were reflected in the peaks and troughs of visual motion data, translating into dynamic auditory pulses in the soundscape.

→My Role as Facilitator

As the human participant, my role was multifaceted: I was a designer, facilitator, and collaborator within the network. By designing the code, positioning the laptop, and initiating the experiments, I created the conditions for narrative agents to interact. Yet I also stepped back, allowing the agents to intra-act autonomously, ensuring that the storytelling was not dictated but emergent.

1.4 Results & Observations

→The 3D Model: A Media Fossil of the Passage

The body-camera experiment produced a warped and layered spatial representation of De Nieuwe Passage. The resulting 3D model, 'Artifact IMΔG3–42', revealed a computational hierarchy of visibility—the permanence of the architectural structure remained discernible, while human presences dissolved into voids or morphed into ghostly traces. The algorithm privileged structural stability over transient movement, creating what I call a 'media fossil'—a preserved trace of the arcade's relational dynamics excavated through technological mediation.

This fossil-like quality aligns with Siegfried Zielinski's notion of media archaeology, where media artifacts preserve fragments of temporal and spatial dynamics for reinterpretation[10]. The model captured what Barthes called the "that-has-been[11]," emphasizing the tension between permanence and transience. The arcade's underlying structure remained intact, yet ephemeral human presences were reduced to spectral traces or entirely erased, revealing the selective nature of computational mediation.

→The Soundscape: Transducing Movement into Auditory Presence

The movement-transduction experiment complemented the 3D model by rendering the impermanence of human flows tangible. Through layered tones resembling a heartbeat or drone-like hum, the soundscape amplified the arcade's dynamic rhythms, transforming visual motion into auditory presence. While the body-camera experiment emphasized architectural permanence, the movement-transduction experiment highlighted movement and flux.

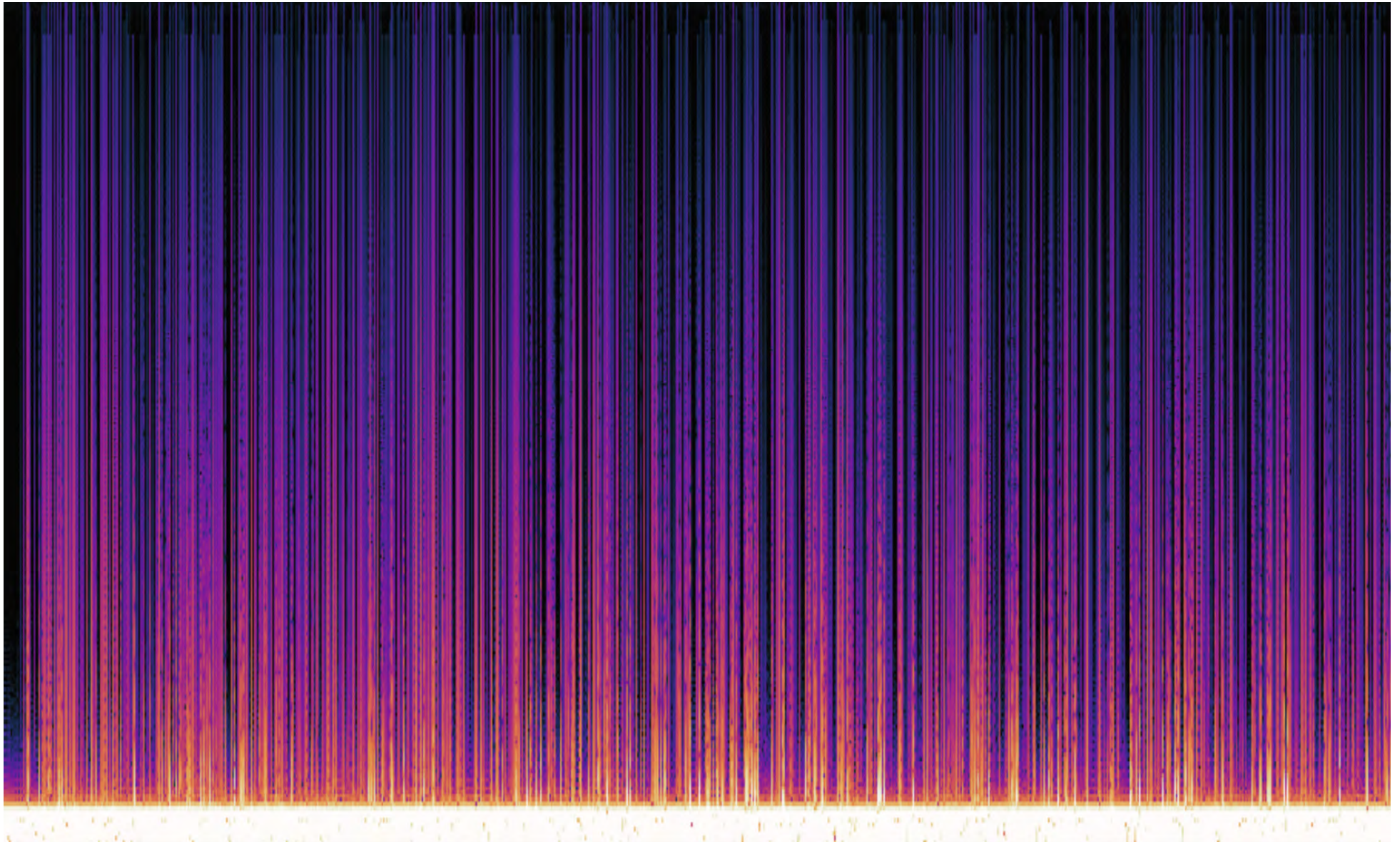
This process aligns with Don Ihde's exploration of technological mediation[12], in which technologies transform the nature of our perceptions by amplifying certain aspects of reality while reducing others. The experiment foregrounded rhythmic movement while other dimensions remained outside its perceptual frame.

→Suspended Relationality: From Live Processes to Preserved Artifacts

A key outcome was what I call "suspended relationality"—the transformation of real-time, dynamic interactions into preserved artifacts. While the processes of capturing and transducing data were anchored in the immediate "here and now," the resulting 3D model and recorded soundscape

[10] Siegfried Zielinski, Deep Time of the Media: Toward an Archaeology of Hearing and Seeing by Technical Means, trans. Gloria Custance (Cambridge, MA: MIT Press, 2006),7.

[11] Roland Barthes, Camera Lucida: Reflections on Photography, trans. Richard Howard (New York: Hill and Wang, 1981), 77.
[12] Don Ihde, Technology and the Lifeworld: From Garden to Earth (Bloomington: Indiana University Press, 1990), 78.



This spectrogram reveals the structured rhythms of De Nieuwe Passage—low tones trace its steady architectural pulse, while peaks mark surges in human flow translated from light into sound.

shifted the emphasis from immediacy to preservation, creating "preserved narratives." These are stories stored within artifacts, removed from their original live context yet capable of being revisited and reinterpreted.

This transformation revealed a significant distinction between live and preserved modes of relationality. In its live state, the soundscape engaged in real-time intra-actions, dynamically responding to the arcade's rhythms. However, once recorded, it became a "sonic fossil," losing its immediacy and relational vitality. Similarly, Artifact IMΔG3–42 fixed the spatial dynamics of the arcade, transforming fluid relationships into stable computational structures.

1.5 Critical Reflections

→Computational Selection and Narrative Hierarchies

The experiment revealed how computational systems impose narrative hierarchies through selective mediation. In Artifact IMΔG3–42, the photogrammetry software privileged architectural permanence over human transience, determining what became visible and what remained hidden. This selection was not neutral but reflected the algorithmic biases embedded in the software, reinforcing certain narrative elements (structural stability) while minimizing others (human presence).

This raises important questions about agency in technologically mediated storytelling: Who or what determines which aspects of a place become part of its narrative? How do computational biases shape the stories that emerge? The experiment suggests that narrative agency is not equally distributed but conditioned by the selective processes of technological mediation.

→ The Tension Between Live and Preserved Narratives

A critical tension emerged between immediate, real-time experiences and their preservation as artifacts. In the arcade, I observed how live processes—the immediate unfolding of relationships between bodies, architecture, and technology—were transformed into fixed "fossils" that could be examined outside their original contexts. This transformation fundamentally altered the nature of the narrative, shifting it from a dynamic, unfolding process to a stable, interpretable object.

This tension raises a fundamental question: Can preserved artifacts retain the immediacy and relational dynamics of the "then and there," or do they inevitably transform these into new forms of engagement?

→ Technology as Hybrid Agent

The experiment challenged instrumentalist understandings of technology as a neutral tool[13]. Instead, technological systems emerged as hybrid agents with their own operational logics and narrative contributions. The camera, photogrammetry software, and sound processing code did not simply document the arcade but actively participated in constructing its narrative through selective amplification, algorithmic processing, and computational interpretation.

This aligns with Zylinska's claim that photography has "ontological, or world-making capabilities,"[14] positioning technologies not as passive instruments but as co-constructors of perceptual and narrative worlds. Technological devices do not only record reality; they help produce it, shifting photography from passive representation to an active site of negotiation between human and more-than-human agents.

[13] Peter-Paul Verbeek, What Things Do: Philosophical Reflections on Technology, Agency, and Design, 11.
[14] Joanna Zylinska, Nonhuman Photography, 59


PANDORA
Pearle

→ The Site of Shared Narrativity

The outcomes of this experiment support the concept of a "site of shared narrativity"—a space where meaning emerges through the distributed agency of multiple actors rather than through singular authorship. The understanding of De Nieuwe Passage shifts from a "nonplace" into an active narrative agent, participated in storytelling alongside human and technological entities, challenging anthropocentric models of narrative creation.

This shared narrativity suggests a more porous boundary between author and environment, where meaning is not imposed but emerges through relations. The arcade was not merely represented but actively shaped how it was perceived, experienced, and translated into digital artifacts.

The first iteration at De Nieuwe Passage revealed how computational mediation privileges certain narratives—solidifying architecture while reducing human presence to spectral traces. It showed that technological systems actively shape visibility, producing what I later called “media fossils.” This raised my interest in more fluid, real-time intra-actions. In the second iteration, I moved from a controlled urban arcade to the volatile presence of storm Conall in The Hague’s city forest, exploring how a less predictable more-than-human entity could co-create narrative, and how mediation might shift from stabilizing to responsive.

2. Iteration 2: Storm Conall

2.1 Naming Storms

On Wednesday, November 27, 2024, storm Conall swept over the Netherlands. As I cycled to the Royal Academy of Art, thoroughly tested by the storm's force, I could not deny the excitement I usually feel whenever the weather asserts itself. The meteorological story of Conall was unfolding before my eyes, with the core of the low-pressure system positioned above the Strait of Dover, creating a fierce wind field that the Dutch Met Service (KNMI) named 'Conall.'

The tension between observing weather phenomena to understand patterns and engaging imaginatively with their agency reflects how human systems of meaning interact with non-human material agency. This lead me to set-up an experiment with the storm.

2.2 Experiment Set-Up

For this experiment, I chose a specific location within Het Haagse Bos, a city forest in The Hague. This decision was not merely logistical but collaborative. I recalled the rhythmic sweeping of the downy birches from walks through this forest during the COVID-19 pandemic, when the creaking movements and sound-showers of leaves felt like a cleansing in those days of isolation. By viewing this specific place as a partner-collaborating-system, the site became not just a passive backdrop but a co-creator.

The experiment was set up with a laptop placed among the roots of a tree, configured to transduce brightness variations into sound. The camera was aimed upwards, capturing the interplay between the stormy sky and the sweeping branches. As raindrops fell on the lens and aluminum casing, the laptop became physically part of the environment. When the storm intensified, brightness fluctuations in the camera's feed produced a dynamic soundscape of layered sine waves, ranging from low, organ-like tones to high, choral-like harmonics.

At one point during the experiment, I spontaneously introduced my hands into the camera's frame. Initially, this was explorative—a moment of "first contact"—but my movements gradually became inspired by the visual rhythm of the branches. These hand gestures altered the soundscape in real time, introducing a human element into the storm's narrative and

creating a feedback loop between human response and environmental conditions.

2.3 Key Narrative Dynamics

→ Storm Conall as a Dynamic Narrative Agent

Storm Conall functioned not as a singular entity but as a dynamic system involving atmospheric pressure, wind, rain, light, and meteorological phenomena working in concert. Its fluctuating energy manifested in wind patterns and light variations that created a constantly changing environment, driving the movements of trees and producing brightness shifts captured by the camera. This interplay positioned the storm not as a passive backdrop but as an active agent co-authoring the narrative through its material presence and force.

The storm's agency was particularly evident in how it influenced other elements in the network. Its energy drove the swaying of trees, which created patterns of light and shadow that the camera registered as data. These variations in brightness were then transduced into sound, creating a direct auditory expression of the storm's changing intensity.

→ The City Forest as a Mediating Agent

The forest, particularly the downy birches, functioned as a mediating narrative agent, translating the storm's energy through rhythmic movements. Rather than simply receiving the storm's force, the trees transformed it into visual patterns of swaying branches and shifting light that could be captured and processed by the camera.

The trees' movements, influenced by the storm's intensity, directly affected what was captured by the camera. This relationship demonstrates the forest's role as an active translator, filtering and modifying the storm's agency into forms that could be registered by the technological system and converted into sound.

→ The Laptop as Compounded Narrative Agent

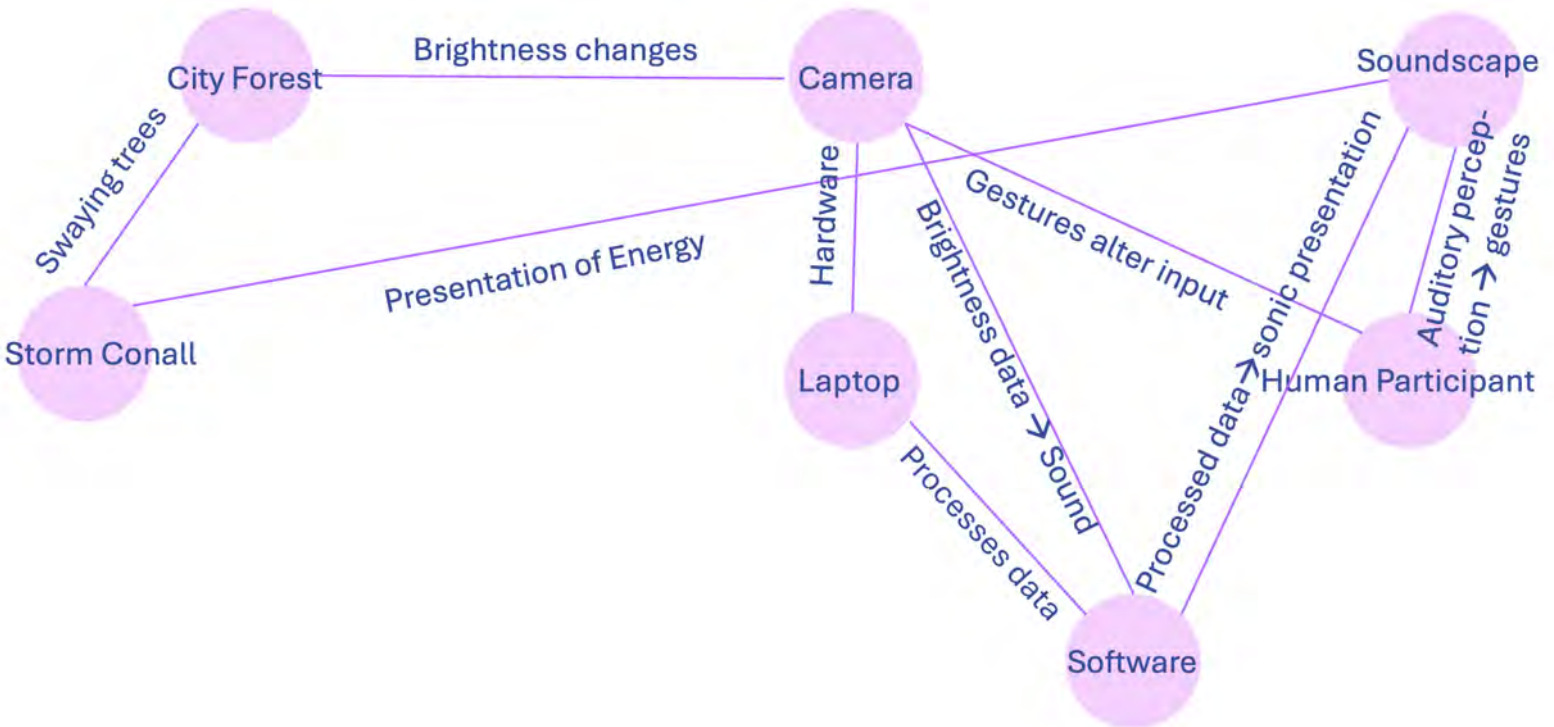
The laptop functioned as a compounded narrative agent, integrating hardware and software to mediate between environmental phenomena and auditory experience. Positioned at a fixed vantage point, its camera captured the visual expressions of the storm and forest, while the custom code applied algorithmic interpretation to these inputs, converting them into a layered soundscape.

This process of transduction—converting visual data into sound—was not a neutral translation but an active interpretation shaped by the system's programming. The code's algorithmic logic determined how brightness variations were mapped to audio frequencies, which aspects of visual motion were amplified or minimized, and how these elements combined into a coherent sonic output.

→ Human Agency and the Feedback Loop

My role in this experiment existed within a productive tension between intentionality and relinquishment. As designer and facilitator, I created the conditions for interaction by positioning the laptop, writing the code, and initiating the experiment. Yet once the system was operational, I stepped back to allow the agents to interact autonomously, placing myself in a position of receptive engagement rather than control.

A critical moment occurred when I introduced my hands into the camera's frame. This action was not a deliberate intervention to impose my own narrative but an intuitive response to the visual rhythms produced by the storm and forest. My hand movements, inspired by the branches' swaying, altered the visual input processed by the system, which in turn modified the soundscape. This created a recursive feedback loop where my gestures responded to environmental patterns, while simultaneously becoming part of the system's input.


City Forest
Brightness changes
Camera
Soundscape
Swaying trees
Hardware
Gestures alter input
Brightness data → Sound
sonic presentation
Auditory percep-tion → gestures
Presentation of Energy
Storm Conall
Laptop
Human Participant
Processes data
Processed data →
Software

2.4 Results & Observations

→ The Soundscape as a Dynamic Narrative and a Live Relationality

The primary outcome of this experiment was a soundscape that functioned not as a representation but as a dynamic narrative expression of the storm-forest-technology-human relationship. Unlike traditional media that document or describe an event, this soundscape was the event itself—a real-time manifestation of the interactions between the agents involved.

The sound created through this process displayed distinct characteristics reflecting the storm's behavior. During periods of stronger wind, when branches swayed more dramatically and light fluctuations increased, the soundscape produced deeper, more frequent bass pulses and more complex harmonics. During calmer moments, the sound became more subtle and spacious.

The soundscape exhibited a spatial quality that documentation could not capture. It enveloped listeners within its field, creating an immersive experience and live relationality that dissolved the boundary between observer and environment. Rather than positioning the storm as something to be viewed from a distance, the sound drew listeners into its presence, generating a multi-sensory space where human participants became part of the narrative.

→ The Emergence of Feedback Loops

A significant observation was the development of feedback loops within the system. The introduction of my hands into the frame created a circuit of response where the soundscape influenced my movements, which in turn altered the visual input, further modifying the sound. This recursive pattern demonstrates how narrative agency circulated through the network rather than flowing linearly from one agent to another.

This feedback loop was not pre-designed but emerged organically from the system's structure and my spontaneous engagement with it.

2.5 Critical Reflections

→ Beyond Anthropocentric Narratives

This experiment challenges anthropocentric models of storytelling by demonstrating how narrative can emerge through the intra-actions of human, technological, and more-than-human agents. Rather than positioning the storm as a subject to be represented through human language or imagery, the experiment created conditions where the storm's material agency could participate directly in narrative formation through its effects on light, movement, and sound.

Structuralist narratology tends to frame nature as either a passive backdrop for human action or as an object to be interpreted through human frameworks. This experiment suggests an alternative approach where more-than-human entities contribute actively to narrative formation, not as subjects of human discourse but as agents with their own expressive capacities.

→ Technology as Mediator and Co-Creator

The compounded agency of the technological systems in this experiment functioned not only as a tool for human expression but as an active participant in narrative creation.

This dual nature aligns with Peter-Paul Verbeek's notion of technology as an active mediator that transforms human-world relations[15], but in this experiment, the technological system is framed not merely as an enhancer of human perception, but as a narrative agent in its own right—co-creating meaning alongside human and more-than-human entities.

Its role was neither neutral nor transparent; the laptop-

[15] Peter-Paul Verbeek, What Things Do: Philosophical Reflections on Technology, Agency, and Design (University Park, PA: Pennsylvania State University Press, 2005), 154

camera-code assembly introduced its own biases, affordances, and constraints that shaped how the storm and forest were translated into sound.

By focusing on brightness variations, the system amplified specific aspects of the environment while excluding others. Temperature, barometric pressure, humidity, and other dimensions of the storm remained outside the scope of what was transduced into sound. This selective mediation reflects the algorithmic priorities encoded in the system, revealing how technological mediation always involves choices about what is amplified and what remains imperceptible.

→ Liveness, Temporality, and Preservation

A central tension in this experiment concerns temporality—the relationship between live, immediate experience and its potential preservation. Unlike the arcade experiment, which resulted primarily in preserved "fossils," this experiment existed primarily as a live, ephemeral event. Its essential quality was its presence in the moment, its responsiveness to changing conditions, and its existence as process rather than product.

This emphasis on liveness challenges approaches to artistic creation that prioritize the production of stable artifacts. The experiment suggests that narrative can exist as a temporal unfolding rather than a fixed text, as a process of becoming rather than a completed object.

→ Embodied Engagement and Sensory Knowing

The experiment revealed the importance of embodied, sensory engagement in relating to more-than-human agencies. By creating a soundscape that responded to environmental conditions, the system enabled a form of knowing that was not primarily intellectual or analytical but experiential and affective. The storm was not merely observed but felt, heard, and experienced as a presence within a shared sensory space.

This sensory approach challenges the primacy of visual and linguistic modes of engagement that tend to position the human as a detached observer rather than an embedded participant. Sound, with its immersive, spatial qualities, created a more immediate relationship with the storm and forest—one based on presence and attunement rather than observation and interpretation.

This embodied mode of engagement suggests possibilities for environmental aesthetics that move beyond representation toward co-presence. Rather than attempting to capture or document the more-than-human world, such approaches might focus on creating conditions for direct sensory engagement, allowing human participants to experience environmental agencies through immediate, responsive interaction. This shift from representation to presence points toward a more relational environmental aesthetics based on attunement and reciprocity rather than documentation and analysis.

The experiment with storm Conall demonstrated how narrative can emerge through real-time transduction, where the more-than-human agency of a weather system actively shapes its own sonic articulation. Unlike the photogrammetric fossil of the arcade experiment, this iteration privileged immediacy and ephemerality, allowing meaning to unfold as a dynamic process rather than a stabilized artifact.

This tension between immediate experience and archival transformation raised new questions about the temporal dimensions of more-than-human narratives. If the arcade experiment produced computational fossils that fixed meaning, and the storm experiment generated ephemeral expressions that resisted fixation, could there be a middle ground where meaning accumulates over time without becoming entirely static?

This inquiry led me to exploring how urban soundscapes might gradually sediment themselves into visual form. Rather than capturing instant moments or generating real-time responses, this third iteration

investigated how meaning might emerge through progressive accumulation—a process that neither fixes narrative into permanent forms nor keeps it entirely fluid, but allows it to build up like geological layers, creating what might be called "temporal fossils" that record the passage of sound through space.

3. Iteration 3: Tokyo's Sonic Palette

3.1 A City That Sings

Tokyo is a city that sings, whistles, hums, and buzzes in ways that feel foreign to my European ears. At train stations, artificial birdsongs blend with mechanical rhythms. Crossing the street, zebra crossings emit playful tones that narrate the pedestrian flow. In the evening, bright billboards scream with advertisements, matching the energy of bustling crowds in underground malls.

Yet Tokyo also offers moments of contrast. Just steps away from dense urban centers, the pace slows and the soundscape shifts. The vibrant cacophony fades into low-frequency hums of cars and distant rumbles of underground trains, softened by occasional wind swirls between skyscrapers. These spaces offer not silence but an intricately layered stillness, where subtle sounds breathe and linger.

I began to wonder: Could I create photographic images shaped entirely by Tokyo's soundscapes? What if the sounds of a place could act as a kind of "exposure," shaping the light and color of an image as they evolve in real time?

3.2 Experiment Set-up

To explore this, I developed a custom code in Processing that allowed sound to co-compose images. The camera functioned as a silent observer, continuously recording, while the live soundscape directly influenced the evolving photograph. The system analyzed sound in three frequency bands—low, mid, and high—each mapped to a specific color channel:

Low frequencies (passing subways, distant traffic) deepened red tones. Mid-range frequencies (voices, ambient music, crowds) shaped green hues. High frequencies (electronic beeps, birdsong, sirens) intensified blue values.

A crucial element was pixel memory, which allowed colors to accumulate over time, layering and shifting as the soundscape unfolded. Much like a long exposure captures the passage of light, this process captured the accumulated presence of sound, imprinting each location's sonic fingerprint into the image itself.

3.3 Key Narrative Dynamics

→ The Soundscape as an Active Structuring Force

Tokyo's soundscape functioned not as ambient background but as an active structuring force that modulated the photographic image's formation. Each location's distinct sonic character directly shaped the visual outcome. The soundscape emerged from a complex interplay of human, technological, and environmental sounds, forming a more-than-human entity that actively intervened in the visual domain rather than passively being represented.

The agency of the soundscape materialized through its ability to structure instability and pattern within the image. It dictated fluctuations in pixel brightness, color saturation, and spatial distribution, transforming the photographic surface into a dynamic field of relations.

→ The Soundscape as an Active Structuring Force

The laptop functioned as the primary mediating entity, integrating visual and auditory inputs through computational transduction. Through its camera and microphone, it captured two distinct sensory streams

that were processed through algorithmic logic that determined how sound influenced visual formation.

The code operated as a set of translation protocols, determining how specific frequencies corresponded to color channels, how sonic intensities influenced pixel brightness, and how these effects accumulated over time. This computational mediation was not neutral—its software architecture and algorithmic biases structured the relationships between sound and image, determining which aspects of the soundscape became visually perceptible.

→ Algorithmic Logic as Governing Translation Mechanism

At the core of this experiment is the algorithmic logic that functions as the key translation mechanism, determining how sonic intensities modulate visual structures. Unlike the camera and microphone that passively receive sensory input, the algorithm enforces rules of interaction, defining how transduction unfolds and setting parameters for how soundscape fluctuations shape the image.

This algorithmic logic makes specific decisions about which sonic properties are visually encoded, establishes thresholds that determine when and how visual changes occur, and enforces temporal structuring that dictates whether sound-based alterations accumulate over time or remain momentary.

The algorithm creates a productive tension by enabling an encounter between two sensory modalities—sound and image—that don't naturally map onto each other. The resulting images are not purely photographic in the traditional sense but artifacts of computational mediation, embodying the entangled interactions between the digital system, sound, and environment.

→ The Researcher as Facilitator and Conduit

My role in this experiment departs from conventional understandings of the photographer as the primary author of meaning. Rather than composing with deliberate intent, I function as a conduit that facilitates interactions between human, technological, and environmental forces. My presence doesn't dictate the outcome but structures the conditions under which meaning emerges. While my interventions are intentional—writing code, selecting locations, positioning equipment—they are not totalizing. Once the system is activated, the experiment unfolds autonomously, with its output co-authored by interactions between sound, digital materiality, and algorithmic processes.

→ The Site as Environmental Co-Author

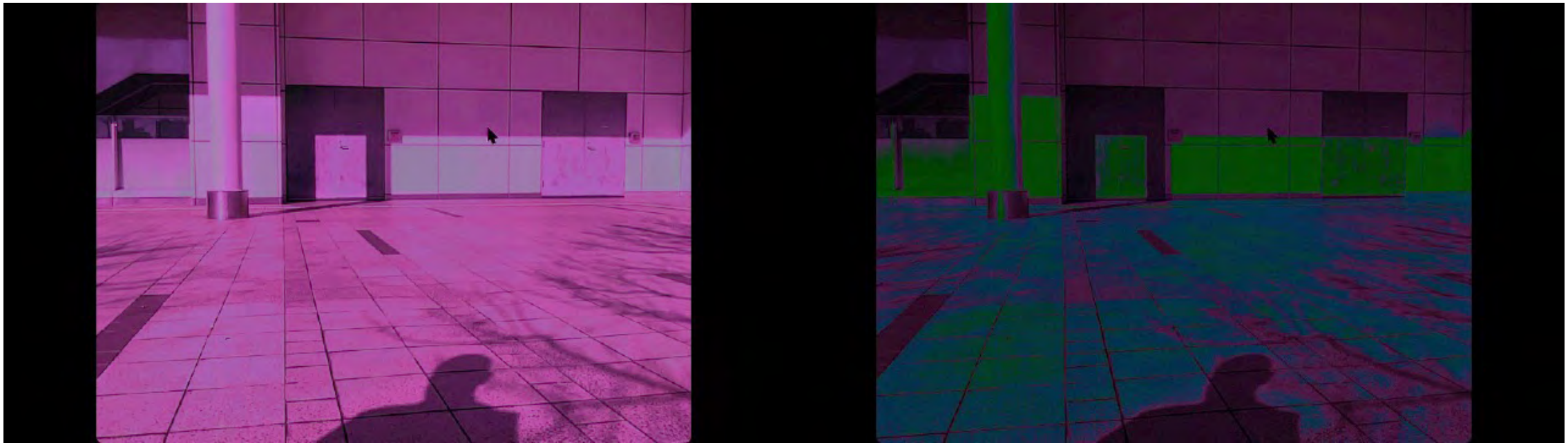
Each location in Tokyo functions not as a passive backdrop but as an environmental co-author with its own distinctive sonic character. The environment's unique combinations of sounds, rhythms, and acoustic properties directly influence the visual outcomes. The site becomes integral to the narrative process, not merely as content to be recorded but as an active force shaping how the image materializes.

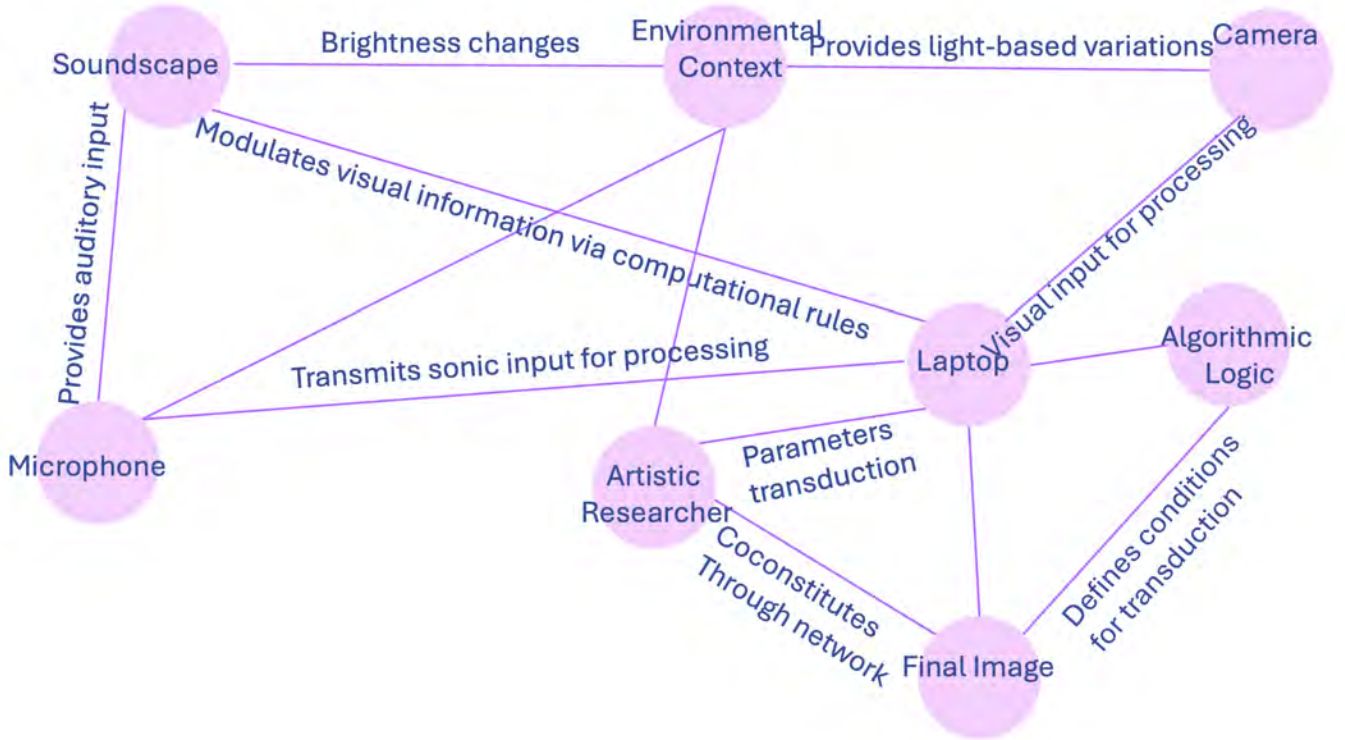
3.4 Results & Observations

→ Site-Specific Visual Signatures

Each location produced distinctly different visual outcomes that reflected its unique sonic character. These differences manifested not only in color and brightness but in the structural properties of the images themselves:

At Shinjuku Station, where the soundscape was dense, rhythmic, and layered with countless human and mechanical interactions, the resulting images displayed heightened saturation, visual fragmentation, and dynamic patterning. Areas of the image corresponding to announcements, electronic signals, and concentrated




Soundscape
Brightness changes
Environmental Context
Provides light-based variations
Camera
Provides auditory input
Modulates visual information via computational rules
Visual input for processing
Transmits sonic input for processing
Laptop
Algorithmic Logic
Microphone
Artistic Researcher
Parameters transduction
Coconstitutes Through network
Final Image
Defines conditions for transduction

human activities showed intense color modulation and reduced stability, creating a pulsing, vibrant visual field that reflected the station's sensory intensity.

In quieter locations, such as liminal corridors between residential buildings, the images maintained greater visual coherence with more subtle color variations and smoother transitions. The muted soundscape of distant traffic produced images with greater uniformity and less dramatic fluctuation, though still capturing the subtle rhythms present in these seemingly quiet spaces.

→ Cross-Modal Sensory Translation

The experiment revealed how transduction—converting data across sensory modalities—creates new perceptual experiences that neither visual nor auditory senses alone could produce. By mapping sound to color channels, temporal sonic patterns were transformed into visual compositions, making auditory rhythms and frequencies visible in ways that challenge conventional sensory categories.

This cross-modal translation enabled certain aspects of the environment to become perceptible in new ways. Low-frequency urban hums that typically remain in the background of conscious awareness became visible as subtle red undertones. The rhythmic patterns of footsteps, train arrivals, and electronic signals manifested as visual pulses and textures.

→ Photography as Temporal Accumulation

The experiment fundamentally reconfigures photographic temporality by shifting from the decisive moment to durational accumulation. Rather than freezing a single instant, these images build up over time, with sustained sounds leaving stronger imprints than transient ones. This process more closely resembles geological sedimentation than traditional photographic exposure.

This accumulation reveals how different sonic elements persist differently over time. Consistent background hums (HVAC systems, distant traffic) create stable foundational color layers; rhythmic patterns (footsteps, train arrivals) produce regular visual pulses; sudden events (announcements, passing vehicles) appear as momentary intensifications.

The resulting images don't represent specific moments but instead embody the temporal unfolding of place, capturing its rhythms, patterns, and fluctuations as visual sediment. This challenges the conventional understanding of photography as a medium that arrests time, instead positioning it as a process that accumulates it, creating what might be called "temporal fossils" that record the passage of sound through space.

3.5 Critical Reflections

→ Destabilizing Visual Dominance in Photography

This experiment challenges the ocularcentric foundation of photography by positioning sound as a structuring force in image formation. Throughout photography's history, visual perception has been privileged as the primary mode of engagement, with the camera functioning as an extension of the eye. By allowing sound to shape the visual field, this experiment disrupts this hierarchy, demonstrating that photography need not be exclusively determined by optical logic.

This disruption could have implications for how we understand photographic meaning. If images can be structured by non-visual forces, then photography's claim to visual truth becomes more complex. The experiment suggests that photographs need not be understood solely as visual documents but as artifacts of cross-sensory engagement, where multiple perceptual modalities can contribute to meaning formation.

→ Photography as Processual Rather Than Fixed

The experiment repositions photography from a medium of fixity to one of process, challenging the understanding of photographs as stable documents that preserve single moments—what Roland Barthes described as a "certificate of presence" that attests irrevocably to what has been,[16] and what Susan Sontag called a "trace of something that has been," likening the photograph to a footprint or a death mask.[17] This processual quality fundamentally alters how photographic meaning operates:

Instead of meaning being fixed at the moment of capture, it emerges gradually through accumulation.

Rather than being determined solely by the photographer's intentions, meaning evolves through environmental interactions.

In place of representational finality, the image maintains a state of becoming that reflects its ongoing formation.

This approach aligns with new materialist perspectives that understand matter as dynamic rather than static. Just as Barad argues that entities don't preexist their interactions but emerge through them, these photographs don't precede their engagement with sound but materialize through it. The image is not captured but grown, unfolding through duration rather than being arrested in an instant.

→ Transduction as Boundary Crossing

The experiment's use of transduction—converting data across sensory modalities—reveals how technological mediation can create productive crossings between perceptual boundaries. By translating sound into visual form, the process creates hybrid sensory artifacts that belong fully to neither domain but exist at their intersection, challenging conventional categorizations of sensory experience.

This boundary crossing has significant implications for understanding how meaning operates in multimedia environments. Rather than treating different sensory modes as separate channels, transduction demonstrates their potential permeability and interconnection. Sound need not remain strictly auditory, nor vision purely optical; through computational mediation, these domains can inform and transform each other, creating new perceptual possibilities that exist beyond conventional sensory categories.

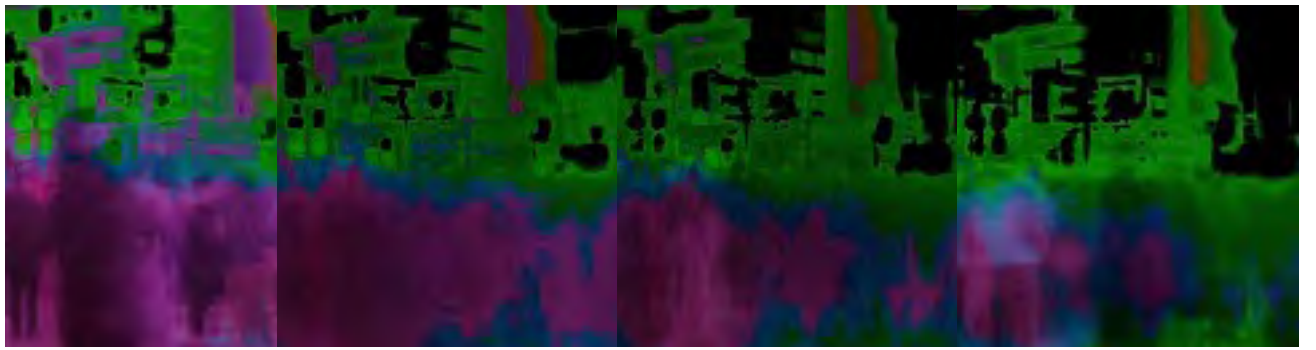
→ Beyond Anthropocentric Authorship

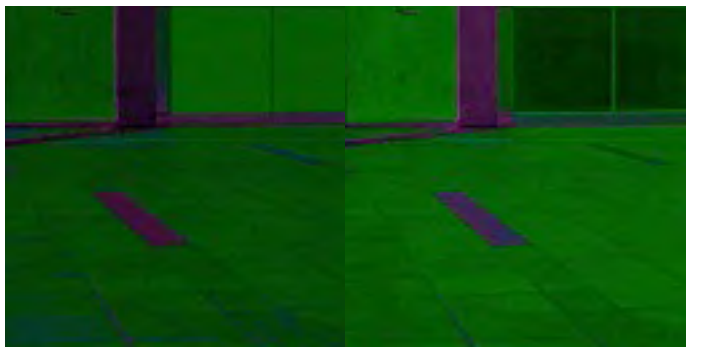
The experiment challenges anthropocentric models of photographic authorship by distributing creative agency across human, technological, and environmental actors. Rather than positioning the photographer as the primary author who imposes meaning through visual choices, it establishes a collaborative network where multiple agencies contribute to the image's formation.

This distributed approach to authorship reframes several key aspects of photographic practice:

The photographer's role shifts from aesthetic controller to system designer and facilitator. The camera transforms from a tool of visual capture to a site of cross-modal interaction. The environment evolves from subject matter to active participant in image formation. The resulting image becomes not an expression of human intention but an artifact of multi-agent collaboration.

[16] Roland Barthes, Camera Lucida: Reflections on Photography, trans. Richard Howard (New York: Hill and Wang, 1981), 79.
[17] Susan Sontag, On Photography (New York: Farrar, Straus and Giroux, 1977),154.





V

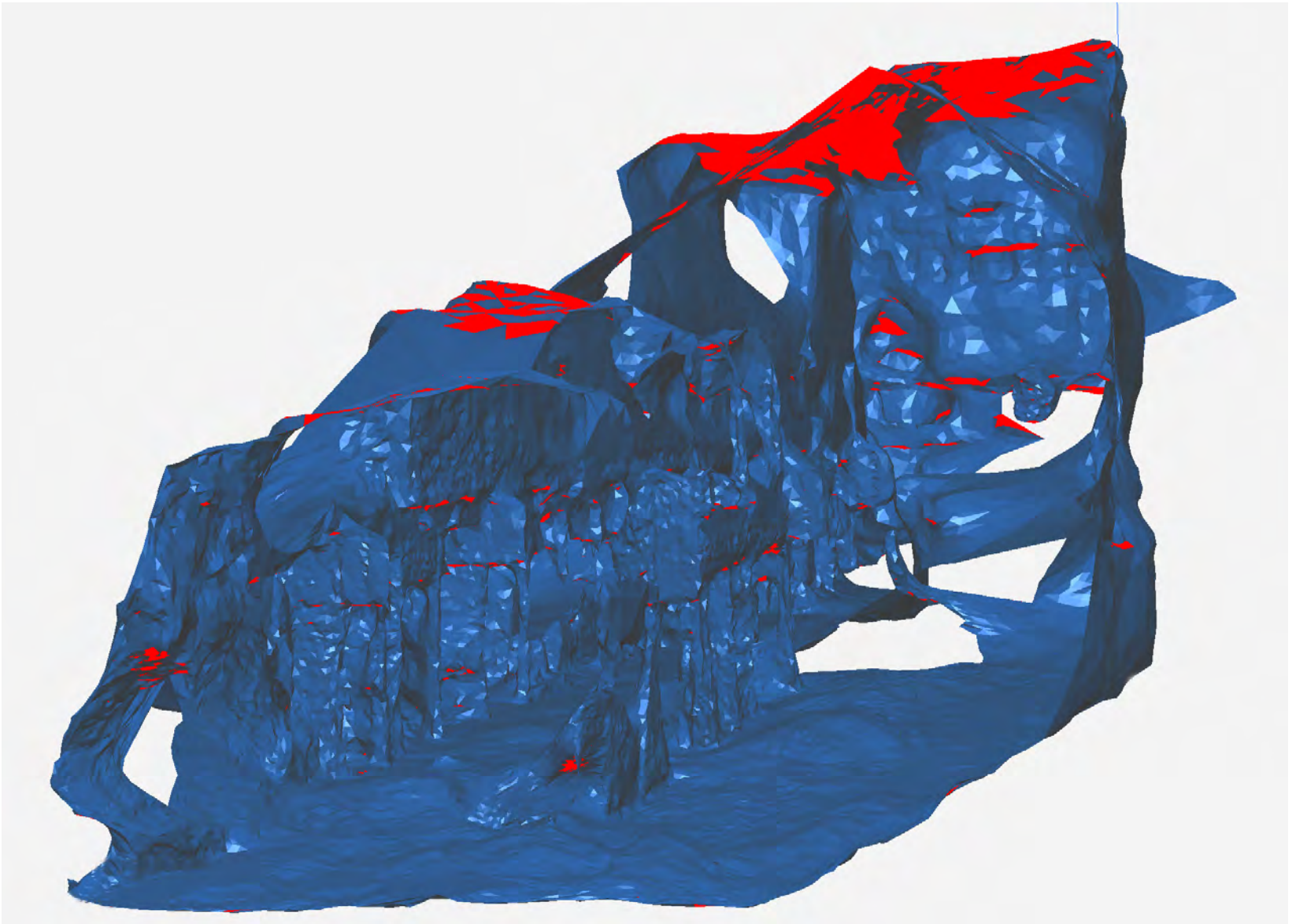
SYNTHESIS ACROSS EXPERIMENTS

1. Thematic Synthesis: Meaning-Making in More-than-Human Narratives

This research challenges human-centered notions of storytelling, rejecting the idea of a singular narrator imposing meaning onto the world. Instead, meaning unfolds relationally, shaped by the entangled agencies of both living and nonliving entities. Through artistic experiments, this inquiry shows that meaning is not a fixed inscription but a process of material engagement, distributed across agents and contexts. By examining how urban, environmental, and technological forces contribute to narrative formation, this section explores how artistic research can function as a site of attunement—where meaning is co-constituted rather than imposed.

1.1 Meaning as an Intra-Active Process

Meaning is neither an external truth to be discovered nor a construct imposed by a singular human author; rather, it unfolds relationally through human, technological, and more-than-human entanglements. This challenges structuralist storytelling models, where a (human) narrator follows a linear, cause-and-effect structure. As N. Katherine Hayles notes, "the contemporary indoctrination into linear causality is so strong that it continues to exercise a fatal attraction for much of contemporary thought," a tendency that "must be continually resisted" in favor of multicausal,



This full-body scan of Artifact IMΔG3–42 captures the arc of a walking path, solidified into a fossil of movement—where the architecture holds shape and human flow slips through computational cracks.

emergent systems of meaning-making.[18]

By decentering human authorship, this research opens new modes of engagement with meaning—not as something dictated or inscribed but as something felt, experienced, and entangled within material processes. This aligns with the material ecocritical argument that matter itself is storied, carrying traces of past and present intra-actions that shape its future potential. This research adds to this framework by developing transductive methodologies that attune to and amplify more-than-human narratives, creating strategies where these stories become legible within human experience.

1.2 Relationality and Meaning-Making

Across the experiments, meaning emerges not as fixed but as an intra-active process, co-constituted through entanglements between human, technological, and more-than-human agents. Challenging structuralist narratology, these experiments reveal that meaning arises through entanglement rather than intention, shaped by forces beyond human control or awareness.

→ Meaning as Emergent Intra-Action Across Experiments

In Artifact IMΔG3–42, meaning materialized through the camera-body entity's intra-action with photogrammetry software and the architectural rhythms of De Nieuwe Passage. The software's selective rendering determined which surfaces were solidified or ghosted, making computational mediation an active storytelling force. This process was neither neutral nor fully controlled but emerged through algorithmic decisions embedded in the system's design.

A similar dynamic unfolded in my collaboration with storm Conall, where wind-swept trees, fluctuating light conditions, and the camera system intra-acted to produce a live sonic artifact. The storm's force modulated the brightness captured by the camera, which altered the generated sound frequencies—a co-authored articulation of the storm's agency rather than a pre-determined composition. The storm was not an external object to be represented but an active participant shaping its own sonic presence.

In Tokyo's Sound Imprints experiment, relational meaning-making extended into the auditory domain. Instead of treating sound as secondary to image, this experiment reversed hierarchies, allowing urban frequencies to inscribe themselves directly onto the visual field. These sonic imprints structured the evolving photographic composition, demonstrating that meaning does not reside in a single sensory mode but emerges across cross-modal intra-actions.

→ From Emergent Meaning to Fossilized Traces

While meaning in these experiments was emergent and unforeseen, it also carried archival potential. The generated images, soundscapes, and digital artifacts do not merely document past intra-actions; they function as fossils through which meaning can be re-encountered and reactivated in new contexts. In Artifact IMΔG3–42, the photogrammetry software's rendering of ghostly human presences encodes past intra-actions that persist as computational fossils. The soundscape of storm Conall, when played back in another time and place, no longer functions as a live articulation of the storm's agency but as a preserved artifact—a sonic fossil.

This distinction between live relationality and fossilized meaning reconfigures storytelling as both an immediate event and an archival imprint. Whether in the spectral remnants of Tokyo's soundscape imprinted onto an image or the algorithmic selection

[18] N. Katherine Hayles, My Mother Was a Computer: Digital Subjects and Literary Texts, (Chicago: University of Chicago Press, 2005), 31

that dictates which elements of a space are visually stabilized, meaning remains fluid—emerging, stabilizing, and re-emerging across time.

1.3 Meaning as a Continuous Process: The Fossil

This research introduces the concept of the fossil—a site where intra-actions momentarily solidify but remain open to future reactivation.

→ Live Intra-Actions vs. Fossilized Traces

This process is evident in the experiments, where some material outputs remain ephemeral, while others stabilize into traces. In Artifact IMΔG3–42, meaning emerged through the intra-action of bodily navigation, automated camera decisions, and computational photogrammetry. The software prioritized architectural stability over human presence, rendering structures sharply while dissolving moving bodies into ghostly traces. Initially, this was an active intra-action; once completed, it left behind digital remnants—computational fossils encoding biases, selections, and material interactions.

A similar dynamic unfolded in the sound-imprint-experiment, where images were shaped not only by light but also by the spectral composition of urban soundscapes. Not unlike traditional long-exposure photography, which accumulates light over time, this experiment accumulated sonic intra-actions, encoding frequencies into pixel structures. These images function as fossils of sound, preserving past sonic encounters. When the process was experienced live, an interesting in-between-state of flux and suspension came to existence.

My collaboration with storm Conall produced a live articulation of the storm's agency through technological mediation. The storm modulated brightness captured by the camera, shaping sound frequencies in real time. Yet, when this soundscape was later stored and played back, a transformation occurred: what was once a live intra-action became a fossilized artifact, severed from its original entanglement yet still carrying the imprint of past relations. Its reactivation no longer depended on the storm but on the conditions of playback, context, and audience engagement.

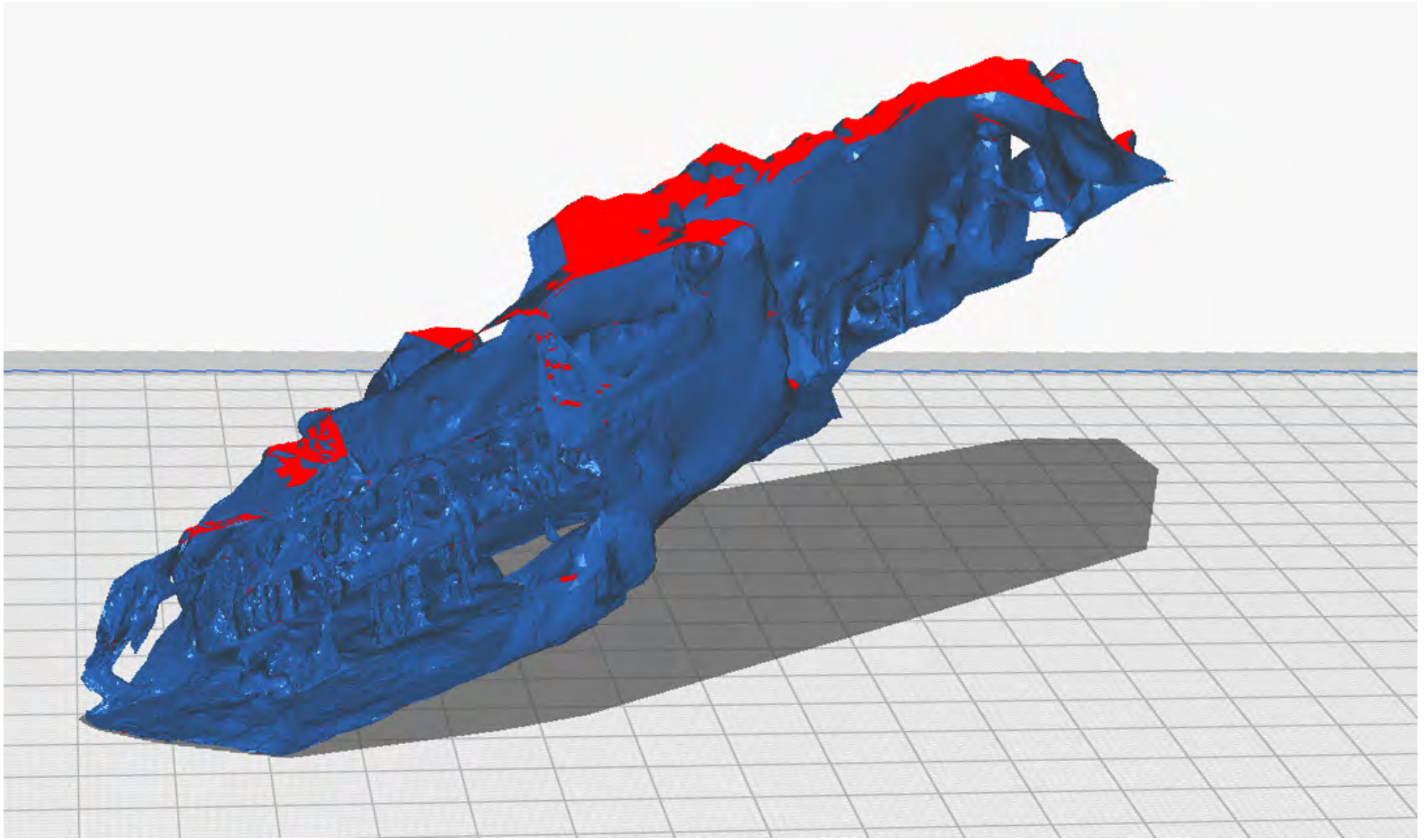
Aspect	Live Intra-Actions	Fossilized Traces	Implications for Artistic Research
Nature of Meaning	Emergent, dynamic, co-constituted in real-time through human, technological, and more-than-human interactions.	Stabilized, lingering as material remnants that hold potential for future activation.	Artistic practice as attunement to emergent meaning and re-engagement with stabilized traces.
Temporal Dimension	Immediate, unfolding in the present moment through relational engagement.	Suspended, waiting to be reactivated in new contexts.	Shifts the researcher's role between active witnessing and reflective re-engagement.
Mode of Engagement	Sensory, immersive, participatory; meaning actively shaped by intra-actions.	Observational, interpretative, requiring contextual reactivation.	Calls for a dynamic approach to research that oscillates between present emergence and archival interpretation.
Function in Research	Generates real-time responses, entangling agents in co-constitutive meaning-making.	Archives past interactions, preserving traces that inform future narratives.	Artistic researcher as a facilitator of meaning's emergence, stabilization, and re-emergence.

→ From Real-Time Engagement to Fossilized Latency

This dual existence of live intra-actions and fossilized traces shifts how meaning is experienced and engaged with:

Live intra-actions generate meaning in real time through sensory entanglement, inviting immediacy, response, and co-presence. Fossils suspend meaning in potential, awaiting new intra-actions to reactivate them in fresh contexts.

This shift extends beyond temporality; it alters modes of engagement. Live intra-actions demand immersion, while fossils call for reflection and re-interpretation. Meaning is not fixed within an object



Seen from above, Artifact IMΔG³–⁴² becomes a digital terrain—tilted, warped, and incomplete—where photogrammetry encodes a memory shaped as much by its gaps as by its surfaces.

but emerges in the space between past and present intra-actions. A fossil is neither fully active nor dormant; it is a threshold artifact, where meaning lingers, waiting to be reawakened by new entanglements.

1.4 Implications for Artistic Research

This research shows that meaning does not preexist but emerges through intra-actions, unfolding relationally across human, technological, and more-than-human agents. This raises a key question: if meaning is emergent and distributed, what is the role of the artistic researcher?

Rather than dictating outcomes, the artistic researcher functions as a facilitator—setting conditions for intra-actions to unfold. The researcher does not impose meaning but mediates entanglements, attuning to their relational dynamics.

At the same time, human interpretation remains unavoidable. As Oppermann argues, multispecies storytelling is always "anthropocentrically tinted" because human language frames these narratives.[19] This research, however, unsettles human linguistic and visual dominance by working with transduction as a method of meaning-making that shifts perception across sensory modalities. Transduction enables more-than-human narratives to be encountered not through representation but through participation, making entanglements audible, visible, and tangible.

→ Transduction as a Method of Meaning-Making

A key insight of this research is that transduction does not simply translate sensory input but reshapes meaning itself. By transducing movement into sound, brightness into rhythm, and sonic frequencies into images, this research reveals how meaning emerges through new intra-actions, creating new sensory relationalities.

The artifacts in this research—whether the shifting soundscape of storm Conall, or Tokyo's spectral sound imprints—do not function as static representations. Instead, they invite ongoing engagement, where meaning is not imposed but co-emerges relationally.

Transduction also challenges the dominance of vision in meaning-making. While photography has traditionally been bound to the visual, these experiments position it within a multi-sensory, intra-active network, where images emerge through computational, environmental, and more-than-human relations rather than as fixed representations.

→ The Role of the Artistic Researcher in Meaning-Making

This balancing act between exerting control and yielding to emergent co-creation does not assume passivity or dominance, but requires attunement to relational dynamics as they unfold.

For this dynamic I like to draw an analogy with Augusto Boal's Theatre of the Oppressed (1979), where meaning is not dictated by an omniscient creator but co-constituted through collective engagement. In Boal's piece, the director does not impose a predetermined script but sets the stage for narratives to emerge through audience participation. Similarly, in this research, the artistic researcher does not author a fixed narrative but establishes conditions where meaning can unfold through intra-actions across human, technological, and environmental entities.

This process involves navigating three key tensions:

—Control vs. Relinquishing Agency

The researcher must set conditions for meaning to

[19] Serpil Oppermann, Ecologies of a Storied Planet : Art, Literature, and Curatorial Practices in the Anthropocene (London: Open Humanities Press, 2023), 70

emerge while resisting the urge to impose a predetermined outcome. This shift from authorial control to facilitation aligns with Henk Borgdorff's framing of artistic research as a practice rooted in "not knowing." As he writes:

"Artistic research is the deliberate articulation of this unfinished material thinking... It creates room for that which is unthought, that which is unexpected: the idea that all things could be different... This is what we may call the radical contingency of artistic research." [20]

—Human-Centered Perception vs. More-than-Human Meaning

Human sensory and cognitive frameworks prioritize certain scales of experience while overlooking others. Tim Ingold argues that perception is not an isolated human faculty but an ongoing entanglement with the world. As he writes:

"Perception is not an 'inside-the-head' operation, performed upon the raw material of sensation, but takes place in circuits that cross-cut the boundaries between brain, body and world." [21] Through transduction, this research makes perceptible that which might otherwise remain beyond human awareness, amplifying more-than-human expressions of agency.

—Representation vs. Co-Creation

Research methods often position the researcher as an external observer capturing and interpreting phenomena. However, these experiments demonstrate that meaning is not only documented but emerges through participatory intra-actions. This shift calls for a more entangled and distributed mode of storytelling, where multiple agents—both human and more-than-human—actively shape the meaning-making process.

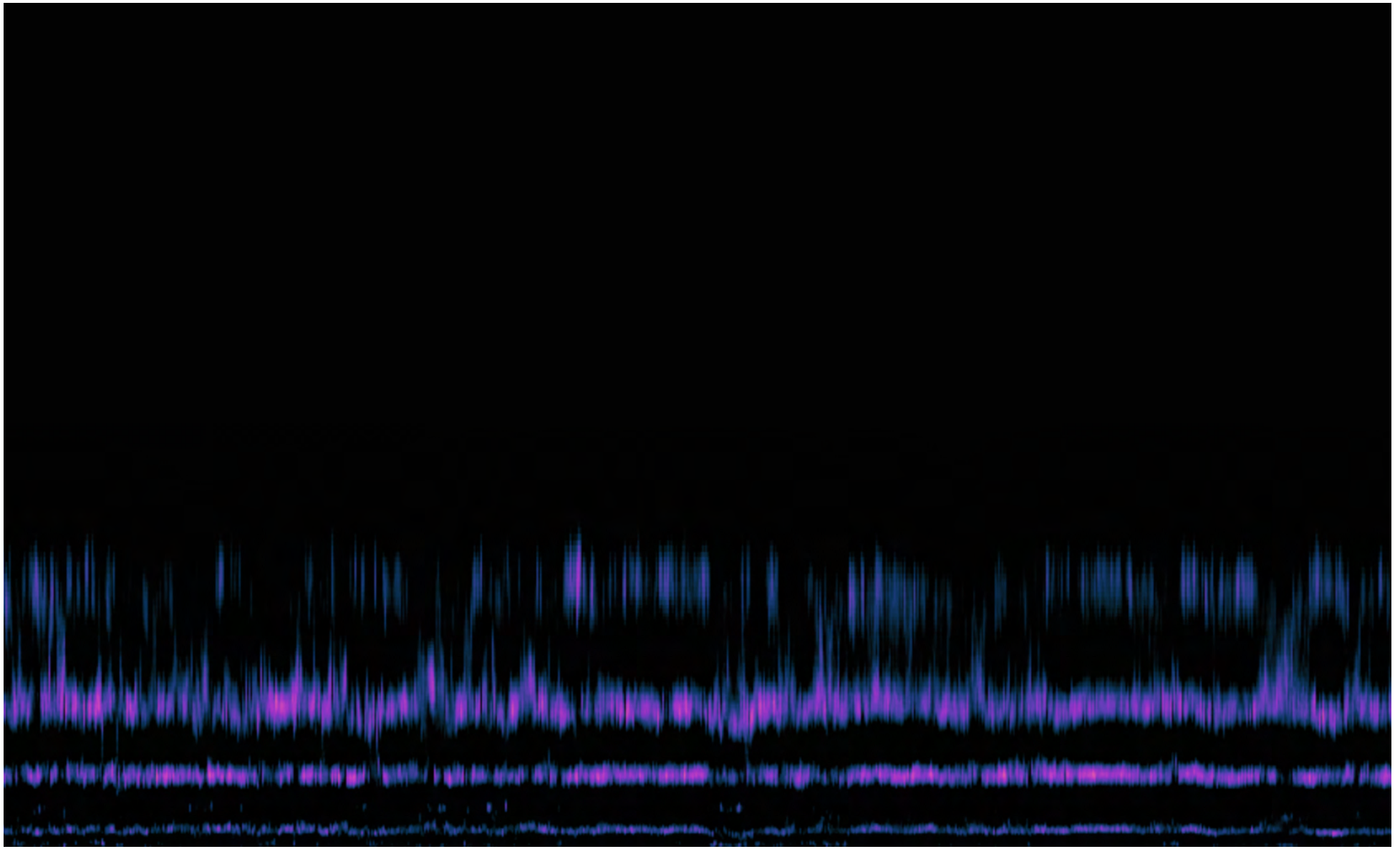
Rather than treating these tensions as limitations, this research embraces them as productive sites of inquiry, pushing artistic research beyond documentation into the dynamic practice of relational engagement.

→ Meaning-Making as a Relational, More-than-Human Process

This inquiry demonstrates that meaning is not authored, fixed, or imposed—it is relational. Meaning does not preexist as an inherent property of objects or agents but unfolds through intra-actions between human, technological, and more-than-human entities. This aligns with Eduardo Kohn's argument positing, that meaning is not confined to human cognition but emerges through the relational processes of both living and nonliving worlds.[22]

By approaching meaning as emergent and distributed, this research expands possibilities for engaging with the more-than-human world. Artistic research, in this framework, is not an act of documenting meaning but of attunement—a way of making perceptible the stories already unfolding beyond human perception. This aligns with material ecocriticism, which argues that matter itself is storied, carrying traces of past and present intra-actions.

[20] Henk Borgdorff, The Conflict of the Faculties: Perspectives on Artistic Research and Academia, Leiden: Leiden University Press, 2012), 71.
[21] Tim Ingold, The Perception of the Environment: Essays on Livelihood, Dwelling and Skill (London: Routledge, 2000), 244.
[22] Eduardo Kohn Toward an Anthropology Beyond the Human (Berkeley: University of California Press, 2013), 99



This spectrogram captures the soundscape co-created by storm Conall and swaying birch trees—layered low-frequency bands reveal a resonant dialogue of wind and wood, as shifting light was transduced into harmonic sound.

This perspective has implications for storytelling, knowledge production, and artistic methodologies:

—From Singular Narrators to Multi-Agential Meaning Formation
Traditional storytelling relies on human authors assigning meaning. This research shifts the focus to meaning as collaboratively formed through entanglements.

— From Declarative Knowledge to Relational Knowledge
Knowledge is not stated as fixed and external but emerges through situated encounters.[23]

—From Representation to Co-Experience
Instead of merely representing more-than-human narratives, artistic methodologies must engage with their unfolding, developing approaches that accommodate more-than-human modes of knowing.

Thus, this research not only proposes alternative artistic methodologies; it questions the assumption that meaning is fixed, human-authored, and representational—arguing instead that meaning emerges relationally through entangled, more-than-human processes.

[23] Donna J. Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," Feminist Studies 14, no. 3 (1988): 575–599.

Aspect	Description	Transduction	Role of Researcher	Meaning-Making Process
Emergence of Meaning	Meaning emerges relationally through intra-actions, not as a pre-existing entity.	Transduction shifts perception by making entanglements tangible.	Facilitator of intra-actions rather than an authoritative narrator.	Relational process rather than fixed representation.
Transduction as Method	Transduction serves as a method of meaning-making rather than just mediation.	Cross-modal transduction reshapes perception across sensory modalities.	Researcher sets conditions for transduction but does not control outcomes.	Meaning remains fluid, shifting through different forms of perception.
Role of the Researcher	Oscillates between facilitator and conduit, depending on the context.	Transduction decentralizes authorship by redistributing agency.	Balances control and unpredictability to let meaning emerge dynamically.	Not a singular author but an entangled participant in meaning-making.
Tensions in Meaning-Making	Meaning is shaped by interplay between human, technological, and more-than-human agencies.	Transduction destabilizes traditional visual and linguistic hierarchies.	Requires attunement to emergent properties rather than fixed interpretations.	Meaning is co-experienced rather than imposed or extracted.

2. Comparative Analysis of Narrative Agency Across Experiments

Across the experiments conducted in this research, narrative agency shifted in response to the distinct spatial, temporal, and relational contexts of each site. While site-specificity significantly shaped meaning-making processes, technological mediation emerged as an equally crucial force, not only amplifying or recording meaning but actively intervening as an intra-active agent that filtered, selected, and transformed how meaning became legible. This comparative analysis examines how three distinct modes of technological intervention structured narrative agency across the experimental sites: computational selection (fixing meaning in the arcade), real-time transduction (translating meaning during the storm), and layered accumulation (sedimenting meaning in Tokyo).

2.1 Site-Technology Entanglements

Each experimental site structured meaning through its material, environmental, and technological composition. However, a key finding of this research is that technological mediation did not merely document meaning—it actively structured how site-specific agencies became legible. Across the experiments, three distinct modes of technological intervention emerged:

→ Computational Selection (De Nieuwe Passage—Arcade Experiment)

In the arcade experiment, photogrammetry software privileged architectural permanence while rendering transient human movement as spectral traces, reinforcing the hypermodern logic of stability, order, and consumer navigation. Meaning was not derived from direct experience but from an algorithmic hierarchy of visibility, where computational biases dictated what was seen and erased. This process resulted in fossilized computational traces, stabilizing certain spatial and temporal elements while erasing others.

→ Real-Time Transduction (Storm Conall—City Forest Experiment)

In the storm experiment, meaning emerged through immediacy and embodied attunement as fluctuating brightness and wind movement were transduced into sonic articulations of the storm's presence. Unlike the arcade's computational filtering, this mediation was not archival but ephemeral, functioning as a live conduit that translated environmental forces into sound in real time. Here, meaning was not fixed but contingent on ongoing environmental conditions, reinforcing the storm's agency in shaping its own articulation.

→ Layered Accumulation (Tokyo—Urban Soundscape Experiment)

In Tokyo, meaning was structured through progressive inscription rather than instantaneous selection or real-time translation. Urban frequencies—infrastructural hums, pedestrian interactions, and electronic billboards—were gradually transduced into a photographic imprint, creating a palimpsestic image entangling multiple temporalities within a single output. Unlike the arcade's computational hierarchy or the storm's transient articulation, Tokyo's mediation layered meaning over time, producing an unstable yet evolving narrative.

While each site shaped the intra-actions between human, technological, and more-than-human agents, it was technological mediation that determined how site-based agencies became legible:

— The arcade experiment resulted in fossilized computational traces that prioritized stability over movement.
—The storm produced embodied, ephemeral expressions, resisting archival permanence.
—Tokyo generated unstable, accumulated inscriptions of time, layering meaning across different sensory modalities.

Site	Mode of Technological Mediation	Narrative Agency Structure	Meaning-Making Process
De Nieuwe Passage (Arcade)	Computational Selection	Photogrammetry software privileged architectural permanence while rendering human movement as spectral traces.	Meaning was fixed through an algorithmic hierarchy of visibility, reinforcing the arcade's hypermodern logic of stability, order, and consumer navigation.
Storm Conall (City Forest)	Real-Time Transduction	Meaning emerged dynamically through embodied attunement to fluctuating brightness, wind movement, and sound modulation.	Technology acted as a live conduit, translating environmental forces into ephemeral sonic expressions that resisted archival permanence.
Tokyo (Urban Soundscape)	Layered Accumulation	Meaning was progressively inscribed through cross-modal transduction, as sound shaped the photographic imprint over time.	Meaning remained unstable and palimpsestic, entangling multiple temporalities within a single output, resulting in an evolving, layered narrative.

2.2 What Happens When Mediation Changes?

The findings suggest that altering the technological agent does not simply modify representation but reshapes the temporal and relational conditions of meaning-making. These shifts determine what can be perceived, sensed, and made legible. For example:

1. If a laptop were replaced with an analog camera, meaning-making would shift from real-time digital transduction to an accumulative analog process. This would eliminate temporal immediacy, creating a fixed image unresponsive to environmental fluctuations, reinforcing a different form of fossilization than the computational selection seen in the arcade experiment.
2. A custom-built sensory device prioritizing touch or vibration would foreground haptic intra-actions, shifting narrative agency away from vision and toward embodied perception. This would not only change perceptual engagement but also reconfigure which more-than-human forces become legible in the process.

The artistic researcher does not only select technological agents but curates the conditions under which meaning materializes. Each mediation method conditions perception—determining which agencies are amplified, which relationships emerge, and which remain outside representation.

These contingencies pose a broader methodological challenge: To what extent does artistic research mediate rather than co-exist with its subjects? By shifting technological conditions, we do not simply change how narratives are told—we reconfigure narrative agency itself, shaping what can be known, sensed, and enacted.

2.3 Site-Specificity as an Intra-Active Force in Meaning-Making

Across this research, site-specificity has emerged not as a passive backdrop but as an active structuring force, co-authoring the conditions under which meaning materializes. Sites are not just locations where experiments take place; their agency emerges dynamically through the entanglement of material, environmental, and technological forces.

Technological mediation did not function in isolation but was fundamentally shaped by the affordances and resistances of each site. The arcade's architectural stability aligned with photogrammetry's algorithmic selectivity, privileging permanence while rendering human movement as spectral traces. The storm's environmental dynamism defied computational fixation, necessitating real-time sonic transduction to translate its shifting brightness into sound. Tokyo's diffuse urban

soundscape resisted singular representation, requiring layered accumulation across time to sediment meaning into a photographic imprint. In each case, the site actively conditioned how intra-actions unfolded, determining whether meaning was fixed, translated, or accumulated.

This suggests that site-specificity is not only material but also technological. The arcade was not only a shopping mall but a computationally reconfigured space. The storm was not just an environmental phenomenon but a transient sonic site. Tokyo was not just an urban environment but a process of sonic inscription. If site is not a fixed entity but something that emerges through intra-actions, then technological mediation itself can be understood as a site of meaning-making.

These site-technology relations reveal moments of alignment and resistance. Some sites harmonized with specific forms of digital mediation—the arcade's architectural logic reinforced computational stability—while others resisted stabilization—the storm's chaotic movement necessitated a non-representational approach. Tokyo's soundscape defied single-modality capture, requiring mediation that acknowledged its layered perceptual registers. These resistances are not failures but indicators of the limits of representation: computational systems privilege certain legibilities, environmental processes defy static capture, and urban ecologies operate through overlapping agencies that resist reduction.

If sites are not merely recorded but actively reconfigured through mediation, then the artistic researcher is not simply selecting locations but engaging in an ongoing negotiation with how sites structure intra-actions. Meaning does not preexist in place but materializes through the affordances, resistances, and relational conditions that mediation makes perceptible.

Aspect	Description	Technological Mediation	Environmental Influence	Implications for Meaning-Making
Arcade (De Nieuwe Passage)	Computationally structured space where photogrammetry dictated visibility.	Algorithmic selection privileged permanence over movement.	Architectural stability reinforced computational visibility.	Meaning was fixed and hierarchized through computational filtering.
Storm Conall (City Forest)	Transient, dynamic environment where wind, light, and movement shaped meaning.	Real-time sonic transduction captured ephemeral conditions.	Environmental instability necessitated a non-representational approach.	Meaning emerged fluidly, resisting stabilization.
Tokyo (Urban Soundscape)	Urban infrastructure shaped by overlapping sonic and visual flows.	Layered accumulation of sound transduced into photographic imprints.	Diffuse, unstable soundscape resisted singular representation.	Meaning materialized through temporal layering and cross-modal interactions.

3. Overarching Networks and Shifting Relations Across Sites

The experiments show that meaning emerges through shifting relational networks across sites. Each experiment involved a different configuration of human, technological, and more-than-human agents, with the distribution of agency evolving in response to environmental, spatial, and technological conditions.

In De Nieuwe Passage, meaning was shaped by the interplay of the body-camera entity, the photogrammetry software, the architectural structure, and human movement. The rigid spatial layout channeled movement in specific directions and influenced how the algorithm interpreted its surroundings. The

photogrammetry process privileged stable elements like architecture, rendering moving bodies as ghost-like traces. This reveals a computational hierarchy: the software decided what became visible and what was erased. Meaning did not emerge from direct representation, but through processes of computational selection and omission.

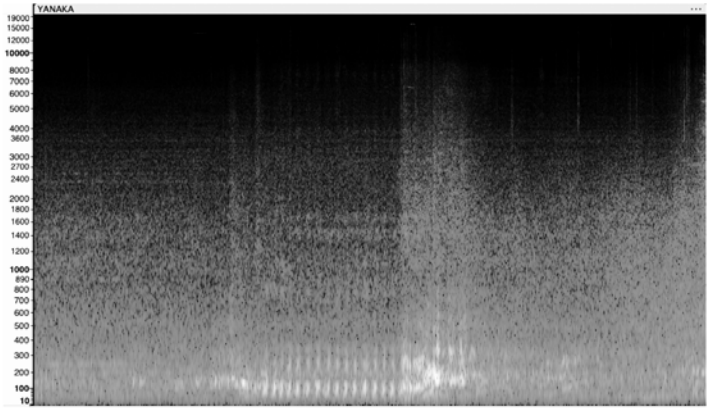
In Storm Conall, the relational network consisted of meteorological forces, trees, and the laptop-camera system. In contrast to the algorithmic structuring of the arcade, meaning here was shaped by environmental volatility. The storm's fluctuating intensity caused changes in brightness, which the camera translated into real-time sound. The trees mediated the interaction, influencing the sonic articulation of the storm. The laptop-camera entity wasn't a neutral recorder, but a responsive system shaped by atmospheric conditions. Unlike the fixed computational logic of the arcade, the storm experiment revealed a fluid network in which agency moved continuously between storm, tree, camera, and wind.

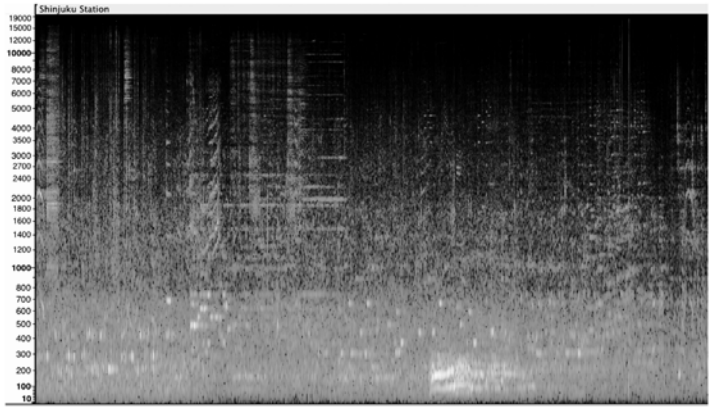
In Tokyo's soundscape experiment, the network was composed of the laptop-camera, the urban soundscape, surrounding infrastructure, and the transduction process. Unlike the arcade's pre-structured computational logic or the storm's environmental dynamics, Tokyo's experiment unfolded within simultaneous and overlapping agencies. Here, sound—not sight—became the structuring force. Tokyo's urban sound-ecologies played an active role in shaping the visual output. The laptop-camera responded to the soundscapes, translating them into visual imprints. The surrounding actants altered the acoustic environment, producing an ever-shifting field of influence. Meaning emerged through these cross-sensory interactions, not from any one domain alone.

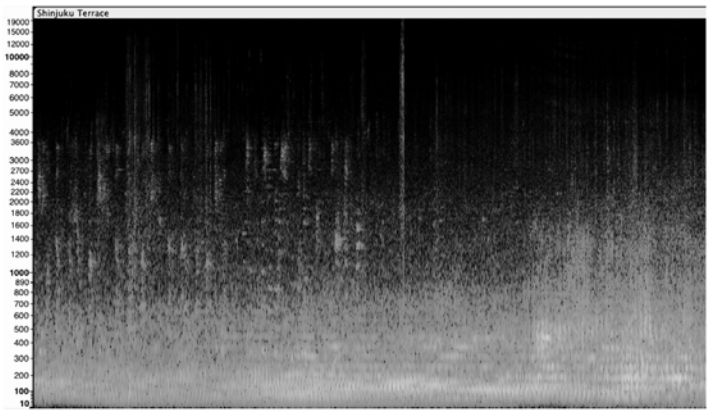
Across all three sites, the relational configuration of the network shaped how agency was distributed and how meaning emerged. In De Nieuwe Passage, photogrammetry enforced a computational logic that decided what counted as visible. In Storm Conall, agency was constantly redistributed as storm, tree, and technology reshaped each other's roles. In Tokyo, agency was multi-layered—distributed across sound, urban systems, and digital translation.

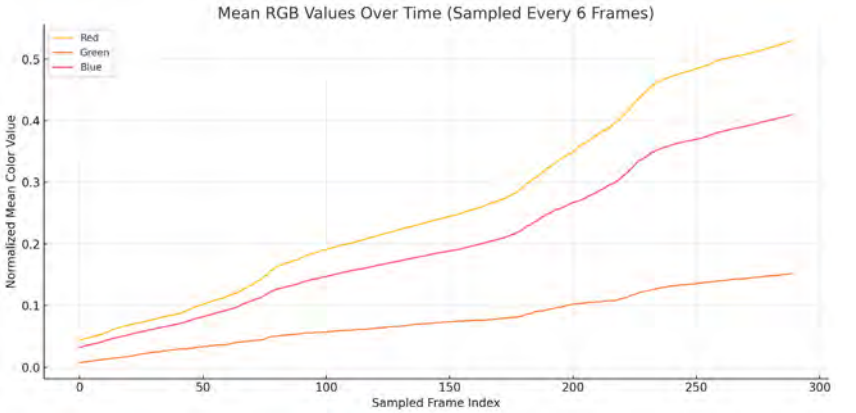
Each of these configurations reveals that meaning does not preexist the encounter—it emerges through the situated intra-actions of human, technological, and environmental agents. Storytelling, in these contexts, is not linear or authored by a single voice. It is a negotiation shaped by shifting distributions of agency and the conditions each site affords.

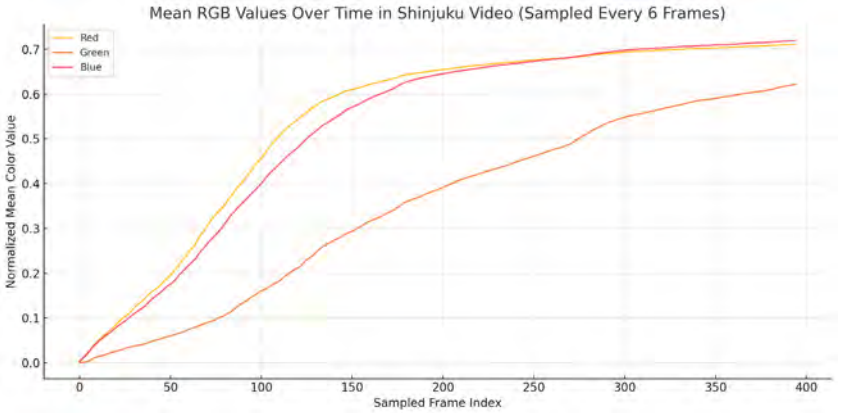
Site & Experiment	Human-Technology Relations	Human-More-than-Human Relations	Technology-More-than-Human Relations	Overall Relational Shift
De Nieuwe Passage (Artifact IMΔG3-42)	Camera-body entity interacts with photogrammetry software; software selectively renders surfaces, privileging architectural stability over human movement.	Human presence is indirectly shaped by computational decisions, appearing ghosted or omitted due to algorithmic prioritization.	Photogrammetry software imposes selective visibility, reinforcing architectural permanence over environmental flux.	Hierarchical computational mediation; meaning emerges through algorithmic processing rather than direct sensory engagement.
Storm Conall (City Forest)	Direct interaction between human, camera, and storm; real-time transduction modulates brightness into sound, forming an emergent sonic output.	Human engagement with the storm is direct and immersive, where weather patterns shape both experience and artistic intervention.	Camera responds to storm-driven fluctuations in brightness, creating a co-authored soundscape rather than a pre-determined composition.	Fluid and emergent relationality; meaning unfolds dynamically through co-presence and real-time interaction.
Tokyo (Urban Soundscape – Sound Imprints)	Sound acts as an agent in image formation rather than an auxiliary element; cross-modal transduction allows auditory frequencies to structure the visual.	Urban infrastructure and more-than-human sonic flows become co-creators of the evolving photographic output.	Sound imprints itself onto visual compositions, blending sonic and visual data into a hybridized representational format.	Hybridized and layered network; sensory modalities intertwine, redistributing agency across human, technological, and environmental scales.

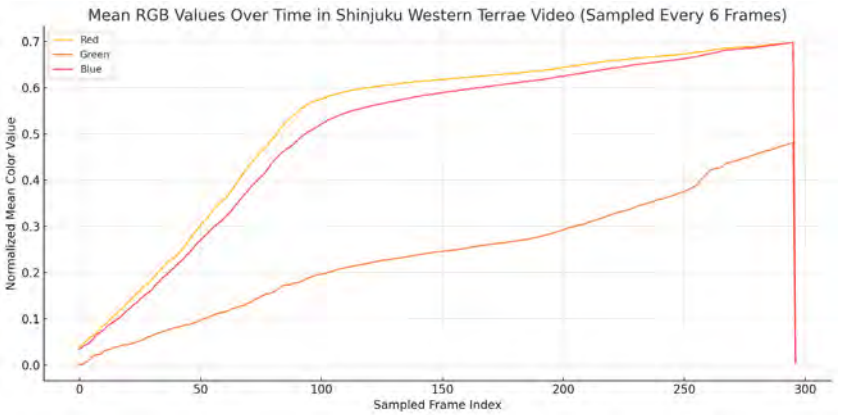







Mean RGB Values Over Time (Sampled Every 6 Frames)
Red
Green
Blue
Normalized Mean Color Value
Sampled Frame Index


Mean RGB Values Over Time in Shinjuku Video (Sampled Every 6 Frames)
Red
Green
Blue
Normalized Mean Color Value
Sampled Frame Index


Mean RGB Values Over Time in Shinjuku Western Terrae Video (Sampled Every 6 Frames)
Red
Green
Blue
Normalized Mean Color Value
Sampled Frame Index

VI
CONCLUSIONS AND FUTURE DIRECTIONS

1. Shifting Horizons: A Conclusion in Motion

Much like the experiments themselves, this thesis has been an ongoing negotiation between entities, methods, and ideas, never settling into a single resolution but instead remaining open, contingent, and emergent.

The journey began with a gaze toward the sky-toward a comet that last passed Earth 80,000 years ago, a presence barely perceptible yet entangled with the histories and imaginaries of those who witnessed it. This research has sought to engage with similar moments of entanglement-where human, technological, and more-than-human agencies come into relation, co-producing meaning in ways that unsettle conventional notions of narrative authorship.

Through artistic experimentation, this thesis has attempted to attune itself to how narrative might emerge beyond the human voice, beyond linguistic structures, beyond the fixed frame of representation. Rather than storytelling as a process of inscription where meaning is imposed onto the world, this research has explored storytelling as an emergent process, a mesh of intra-actions, where meaning is always in the making.

1.1 Transduction as a Means to Investigate

Narratology has long conceptualized narrative as a structured, human-authored construct, where meaning is intentionally shaped through language, plot, and causality. These frameworks assume a singular

authorial presence and a fixed transmission of meaning. This research challenges those assumptions, questioning the singularity of authorship, the linearity of meaning-making, and the dominance of human intentionality in narrative formation.

Instead, my inquiry proposes that narrative is not an act of mastery or inscription but an ongoing negotiation, co-constituted through material, environmental, and technological entanglements. It explored this premise not as a theoretical abstraction, but as a lived and enacted methodology, using transduction as a means to investigate how more-than-human agencies might participate in storytelling.

1.2 Photography as Intra-Action: The Image Beyond Representation

If this research challenges traditional notions of narrative agency, it also calls for a fundamental reconsideration of photography. Photography has long been tied to representation; from its origins as an indexical trace to its contemporary status as computationally processed image. Even digital photography, despite its algorithmic underpinnings, is largely understood as a system for capturing and fixing meaning.

This research challenges that assumption. Rather than a medium of capture, photography emerges here as a process of mediation, where information is structured, filtered, and made perceptible through computational and material conditions.

1.3 The Recurring Tension: The Limits and Selectivity of Transduction

Transduction, whether through photography, sound, or computational imaging, does not just capture external realities: it actively structures what can be perceived. While it enables more-than-human agency to become perceptible, it is an inherently selective process, shaped by technological mediation, human perception, and material constraints. This selectivity is not a contingent limitation of current tools but a constitutive feature of mediation itself. It is a process that simultaneously reveals and excludes, amplifies and erases.

This raises a fundamental tension: Does transduction genuinely amplify more-than-human voices, or does it ultimately impose human-centered frameworks of mediation? What remains inaccessible within current forms of mediation, and how might this shape our understanding of narrative agency?

Transduction does not function as a neutral mechanism; it conditions the very terms of perception, determining what enters the realm of the sensible and what remains beyond recognition. Meaning is not merely disclosed but constructed through the affordances, exclusions, and biases of the systems that process it.

If co-presence is to be taken seriously, then it cannot be reduced to a technical problem of more accurate representation. It must involve a reconfiguration of how narrative agency is distributed. This suggests that co-presence is not only a deeper immersion into the more-than-human world but a transformation in how stories are generated: where meaning does not originate from a perceiving subject but emerges through relational entanglements.

2. Unresolved Tensions and Future Directions

2.1 Beyond the Limits of Transduction

This research has demonstrated that transduction is not just a mode of representation but a means of co-constituting meaning between human, technological, and more-than-human agencies. Yet, it has also revealed that certain intra-actions remain inaccessible, left untransduced, unamplified, or beyond the

reach of current mediation methods. The selectivity of transduction determines what enters the narrative and what remains outside its perceptual and material thresholds.

The experiments conducted in this study have primarily engaged with visual and sonic transductions —converting light into sound, sound into image, and computational traces into spatialized forms. While these approaches extend perception beyond human-centered storytelling, they also reinforce the dominance of sensory registers already privileged in artistic and scientific discourse. This raises a crucial question:

What happens when transduction moves beyond the visual and sonic? Could alternative mediations expand the range of more-than-human narratives that emerge, revealing agencies that remain illegible within existing perceptual paradigms?

Beyond sensory modalities, the question of temporality remains unresolved. The real-time transduction of storm Conall foregrounded the immediacy of more-than-human presence, while the computational accumulations in Tokyo structured narrative as something that unfolded over time. These temporal dimensions suggest that meaning does not always emerge in an instant—it may be sedimented across durations that exceed human perception. Future experiments could push this further by developing materially embedded transductions that unfold over months or years, shifting narrative agency into slower, more-than-human timescales.

Could a transduction process operate at the pace of tree growth, tidal movements, or atmospheric shifts, making meaning felt through durational inscription rather than instantaneous mediation?

Another open question concerns the role of participation. In this research, transduction has largely functioned as a method of revealing more-than-human agency to human perception.

But what happens if humans shift from observers to co-actors within the intra-active process? If mediation could dynamically respond to human touch, breath, or movement, would this foster a more reciprocal form of narrative emergence? More critically, can participation function without re-centering the human, instead allowing for mutual intra-actions where all agents shape the conditions of mediation?

Pushing beyond the current limits of transduction does not mean abandoning its existing approaches but expanding its scope. This would involve:
—Experimenting with new sensory modalities-haptic, olfactory, and atmospheric transductions that extend perception beyond the visual-sonic paradigm.
—Exploring materially embedded processes that unfold across extended durations, shifting the emergence of meaning into slower or faster temporalities.
—Developing participatory mediations that do not extract meaning but enable intra-active storytelling across multiple agencies.

If transduction is to move beyond representation and toward co-presence, the next step is to create conditions where storytelling is not only seen or heard but sensed, lived, and materially entangled. The challenge ahead is not simply to refine existing mediations, but to rethink their structuring logic—to develop transductions that do not just translate more-than-human agency but allow it to participate in meaning-making on its own terms.

2.2 Implications for Future Photographic Practice

Photography is often framed as an act of seeing, but this research proposes that photography should be rethought as an act of structuring information emerging from relational processes. If photographic meaning is not fixed in an image but emergent in mediation, then future photographic experimentation may involve:

1. Exploring non-visual transductions of photographic data, where photography is no longer constrained to optical outputs but expressed through sound, movement, or environmental shifts.
2. Challenging the dominance of digital realism, developing photographic practices that make visible (or audible, or tactile) the erased and unseen intra-actions shaping mediation.
3. Creating photographic systems that evolve over time, shifting from a single moment of capture to processes that accumulate, transform, and interact with their environments.

This raises a fundamental question for future transduction-based practices:

If all forms of mediation impose structuring logics, how can transduction avoid reinforcing human-centered frameworks rather than expanding narrative emergence?

2.3 Can Narrative Agency Extend Beyond Digital Materiality?

If this research has shown that narrative agency emerges through intra-actions rather than as a fixed entity, it also raises a fundamental question: Does digital materiality limit the scope of these intra-actions? Much of this study's mediation has relied on computational systems-algorithms, cameras, sound synthesis, and image processing-to transduce more-than-human agency into perceivable forms. Yet, digital materiality, for all its affordances, prioritizes discrete data points, operates on machinic logic, and often filters out sensory or material presences that resist quantification.

This raises an intriguing possibility: If transduction is to expand, it must explore how non-computational materials might serve as mediators of meaning.

Could a sculptural system transduce intra-actions through weight, texture, and deformation rather than algorithmic processing? Could a biological system use growth, decay, or chemical processes as a form of storytelling? Could the atmosphere itself mediate narrative agency through temperature, wind currents, or air quality shifts?

There are some examples of collaborations with more-than-human agents, that show how storytelling could look like.

2.3.1 Sculptural Mediation

Instead of transducing an entity into digital sound or image, could a physical structure respond to more-than-human intra-actions in real-time? For instance, a material installation might bend, warp, or vibrate in response to external forces-a structure shifting with humidity, expanding and contracting as a way of "telling" the story of air moisture over time. Such an approach would ground narrative emergence in direct material encounter rather than symbolic representation.

A precedent for this exists in the Sea Organ of Zadar, an installation (2005) by architect Nikola Bašić

as part of the project to redesign the new city coast of Zadar, where ocean waves generate sound through an architectural structure of pipes. Here, mediation does not function as an interpretive filter but as a site of direct intra-action, where tides, wind, and resonance continuously co-compose an evolving soundscape. Unlike digital transductions, which translate environmental forces into data-driven outputs, the Sea Organ allows the sea to actively shape its own expressive presence. This structure resists the logic of recording and instead proposes a situated, continuous storytelling inseparable from the environment itself.

2.3.2 Biological Mediation

If more-than-human narratives unfold over time, could living materials act as record-keepers, transducing meaning through organic processes? A microbial culture changing color in response to toxins, or a mycelial network expanding and contracting with moisture levels, could reveal patterns of intra-action unfolding over weeks or months rather than in real-time. Unlike digital storage, which archives meaning in discrete units, biological mediation embodies storytelling through transformation, decay, and metabolic exchange.

Risk Hazekamp's "How Do We Take Care of Our Failures" explores biological mediation by allowing cyanobacteria to imprint themselves onto photographic surfaces. Rather than imposing an image, the artist facilitates a process where microbial growth, light, and environmental conditions shape the final work. This slow, organic mediation challenges conventional image-making and proposes an alternative model for transduction-one that unfolds through biological temporality rather than digital capture.[24]

[24] FOMU. "Cyanobacteria Stories," April 11, 2024. https://fomu.be/trigger/articles/cyanobacteria-stories.

By moving beyond digital materiality, the focus shifts from capturing more-than-human narratives to experiencing them through material entanglement. The role of the artistic researcher also transforms—from facilitating digital transduction to designing conditions where matter itself enacts storytelling. This is not merely a technical expansion but a reconfiguration of mediation itself—an invitation to ask whether transduction can function outside of representation entirely, making meaning something not just perceived but inhabited, lived, and continually reconfigured through intra-action.

2.4 Participation as Intra-Action: From Observing to Entanglement

If transduction has served to make more-than-human agencies perceptible, participatory mediation offers another layer: the shift from observing networks to becoming entangled within them. The challenge, however, is ensuring that participation does not translate into human dominance, nor imply that more-than-human narratives only exist in relation to human engagement. Rather than centering the human as an active manipulator, participatory mediation should function within an autonomous system that operates independently of human presence. The goal is not to grant agency to the more-than-human but to reveal that this agency was always already there.

2.4.1 Listening as Participation

Participation is often framed as an interactive input-output exchange, where an action triggers a response. However, this risks reinforcing anthropocentric control, reducing more-than-human agencies to entities that "respond" to human engagement. Instead, participation could be approached as a form of intra-active listening—not in the literal sense of hearing, but as a mode of receptivity, attunement, and

being shaped by the encounter.

Inspired by Humberto Schwab's use of the term of intra-active listening in Socratic Design[25], this approach reframes listening as something that does not merely extract meaning but is a reciprocal process in which the listener is transformed. Rather than positioning the listener as a passive receiver or the participant as an active manipulator, intra-active listening suggests that all entities involved are co-shaping the exchange. The listener does not "receive" meaning as a fixed entity; instead, they are altered through the act of listening.

This shift from interaction to intra-action is particularly relevant in relation to autonomous systems. If a participatory transduction operates with or without human presence, then participation should not “activate” it, but instead allow participants to sense its ongoing intra-actions. Listening, in this sense, is not about understanding, interpreting, or decoding; it is about becoming-with, allowing one’s presence to be shaped by the presence of others—human, technological, and more-than-human alike.

The Sea Organ of Zadar exemplifies this approach. Humans are welcome to listen, but their presence does not activate the system; it continues regardless of their engagement. The organ does not "play for" humans —it plays because the sea is always in motion. This is a key model for autonomous participatory mediation, in which human presence is incidental rather than essential.

This form of intra-active listening challenges the idea that participation requires direct manipulation. Instead, it emphasizes an attunement to presence rather than control over the experience.

2.4.2 From Listening to Mutual Transformation

If participation is framed through intra-active listening, then it is not just about hearing or perceiving more-than-human agencies—it is about being moved by them. This aligns with broader ethical considerations in participatory mediation:

Participation should not privilege human control but instead allow humans to be shaped by the intra-action.

The system should not require human activation: like the Sea Organ, it should function autonomously, with humans as one of many possible participants.

Listening should not be about decoding meaning but about being in relation, where meaning is emergent and contingent.

By integrating intra-active listening into participatory mediation, the focus shifts from what we can perceive of the more-than-human world to how we are changed through encountering it. This challenges conventional models of interactivity, opening up participatory transduction as a site of mutual transformation rather than extraction.

2.4.3 Participation Beyond Immediate Interaction

Participation also introduces a temporal challenge. Most interactive systems emphasize real-time engagement, where a participant’s action immediately alters the mediated output. But if autonomy is central, then participation must be framed in a way that extends beyond immediate response. And if participation is to function beyond the immediacy of human interaction, then future experiments could explore long-term, slow, or accumulative transduction.

Could a participatory system record intra-actions over months or years, allowing for a form of fossilized participation?

Could participation extend beyond the human lifespan, leaving traces that continue to shift meaning even after human presence has faded?

[25] Humberto Schwab. Socratic Design: Hoe we zelf het bestaan ontwerpen (Amsterdam: Boom, 2023)

One approach could involve participation, measured not in momentary input but in gradual environmental shifts. This could take inspiration from Risk Hazekamp's "How Do We Take Care of Our Failures", where microbial organisms imprint onto photographic surfaces over time. Here, the more-than-human actants shape the medium, and the human participant must wait for the process to unfold. Participation, then, is about observing, attuning, and waiting rather than directing or controlling.

2.4.4 Autonomous Systems: Can Participation Be Unintentional?

The idea of autonomous mediation also introduces another critical question: Must participation always be intentional? If an intra-action is already occurring before and beyond human engagement, then participation may not require deliberate entry into an interactive space. Instead, it could happen accidentally, incidentally, or unnoticed.

A personal experience that speaks to this is an encounter I had with a billboard and a camera in front of The Hague Central Station:

"One evening in front of The Hague Central Station, I found myself caught in an unexpected exchange with a billboard and a CCTV camera. The billboard, usually dormant—just a blank, black screen—stood beneath a small surveillance camera mounted above it. Out of curiosity, I looked directly into the camera's lens.

A red light flickered on. Then, as if in response, the billboard came to life. A message—cheesy, almost too direct—flashed across its surface, as though speaking to me personally: "A Smile a Day Will Keep the Doctor Away". In that instant, I felt drawn into a silent conversation, caught in the network of a camera, a billboard, and myself. It was a fleeting moment, almost too quick to process, but deeply uncanny. I was no longer just an observer; I was part of something—something communicating, something aware.

What struck me was the intimacy of it, the sheer smallness of the encounter. It wasn't a grand installation or a spectacle demanding attention. It felt accidental, as though I had stumbled into a system mid-conversation, and, briefly, it had acknowledged me."

This encounter suggests that participatory mediation could be designed in ways that do not overtly announce themselves as participatory works—but instead allow participation to happen organically, unexpectedly, or even without the participant's full awareness.

2.4.5 Ethical Participation: Designing for Openness

Participatory mediation raises a fundamental ethical challenge: how do we ensure that participation does not reinforce human control, but instead seeks for shared agency among human, technological, and more-than-human entities?

While participatory frameworks often focus on inclusion, they can unintentionally privilege human perception and decision-making, reinforcing anthro-

pocentrism rather than dissolving it. The risk is that participation, even with the intention of entanglement, re-centers the human as the primary actor.

A potential answer lies in designing for openness, rather than intervention—creating participatory systems where human influence is not the defining factor, but one of many intra-acting forces. In such a model, participation is not about activation or authorship but about sensing, witnessing, and co-existing within a larger, self-sustaining network. This means rethinking how participation is structured:

— Autonomy over activation

The system should not depend on human presence to function. Like the Sea Organ of Zadar, the participatory framework should be self-generating, allowing humans to engage with an already-active system rather than initiating it. And it should function beyond human presence.

— Beyond the human sensory scale

Participation should not privilege immediate, human-centered forms of sensing. If an experiment unfolds across slow, accumulative timescales, it must invite engagement beyond human temporalities—whether through materials that register long-term environmental shifts or biological mediations that exceed direct human perception.

— Unfixed and emergent outcomes

Rather than defining the meaning of participation in advance, the system must remain open-ended, allowing meaning to emerge through intra-action rather than being predetermined by design. This prevents participation from becoming an extractive process, where meaning is "captured" rather than mutually shaped.

However, ethical openness is not simply about designing for absence or non-interference. **What happens when an autonomous system behaves unpredictably?** The challenge is ensuring that openness does not result in complete detachment or an artificial neutrality. Participatory mediation, even when decentralized, still involves decisions about which intra-actions to amplify and which to exclude. This raises an important tension:

— Should participatory systems be designed to fail?

If an experiment is truly open-ended, what happens when it produces nothing, or when its output resists human interpretation?

— How much unpredictability can be embraced?

Openness suggests the possibility of unexpected outcomes, but how much contingency can be built into the system before it becomes unreadable?

Rather than positioning openness as an idealized state of complete non-intervention, participatory mediation might benefit from embracing these tensions—acknowledging that participation will always involve negotiations between design and emergence, activation and receptivity, presence and absence.

2.4.6 Future Directions for Participatory Transduction

If transduction has so far been a method of revealing more-than-human agencies, then participatory mediation offers a way to entangle humans within these networks. However, for this to be done ethically, participation must not be about control, manipulation, or extraction—it must be about co-presence, openness, and attunement.

Several questions remain unresolved, pointing

toward new directions for research:

1. Can participation function on deep, long-term timescales?
2. Can participatory mediation be truly autonomous?
3. Can participation be unintentional or ambient?

One way to explore these questions is by designing participatory systems that:

— Are fully autonomous, operating whether humans are present or not.
— Function across deep timescales, allowing meaning to emerge through slow, accumulative intra-actions rather than immediate response.
— Introduce unintentional participation, allowing encounters to happen situationally rather than requiring explicit engagement.
— Emphasize listening over action, framing participation not as an exchange, but as a mode of sensing entanglement.

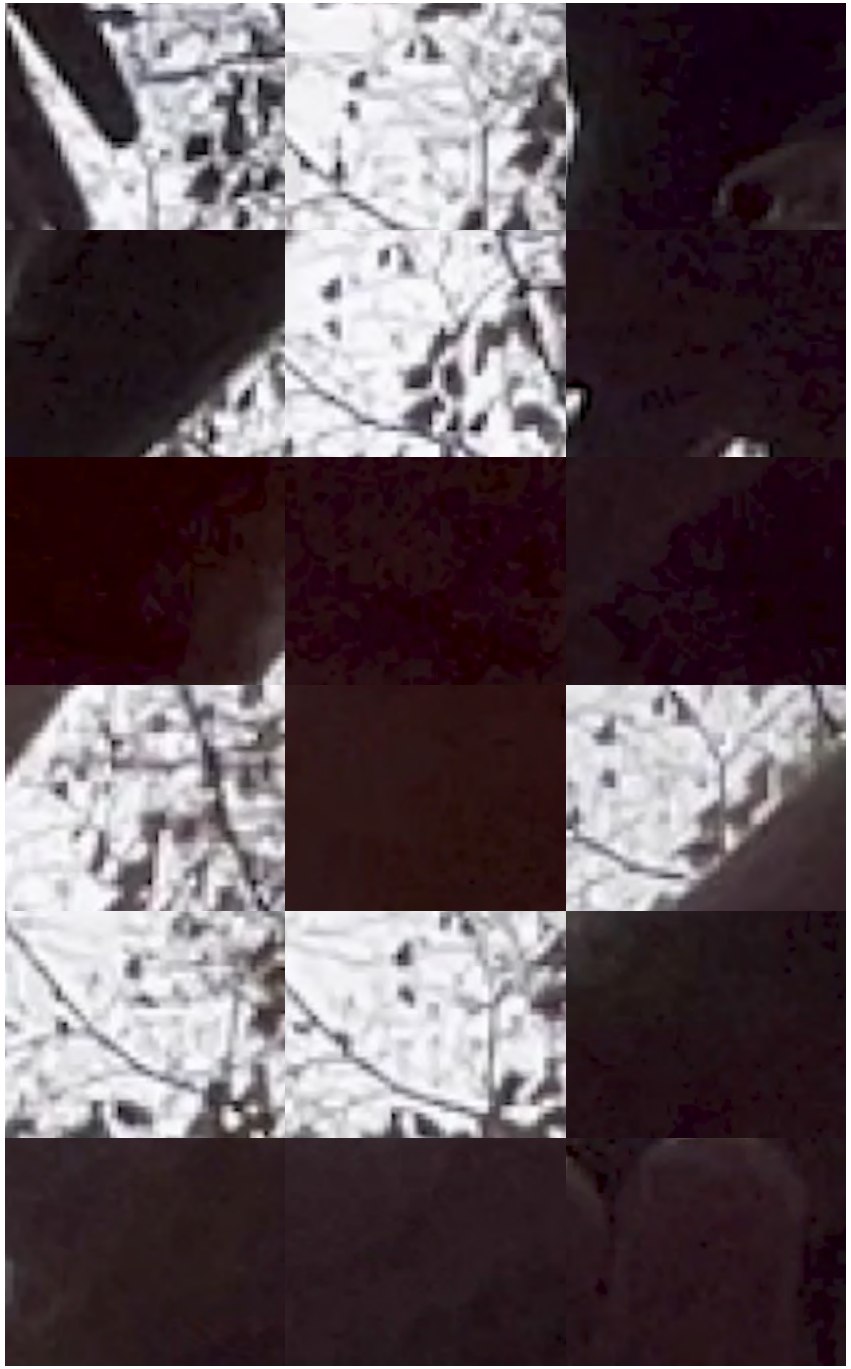
By exploring these possibilities, participatory mediation does not reintroduce the human as a dominant figure, but instead integrates human presence into a broader, autonomous system of intra-action. Participation, then, is not an act of control but a recognition of entanglement—an awareness that human presence is already part of the network, whether noticed or not.

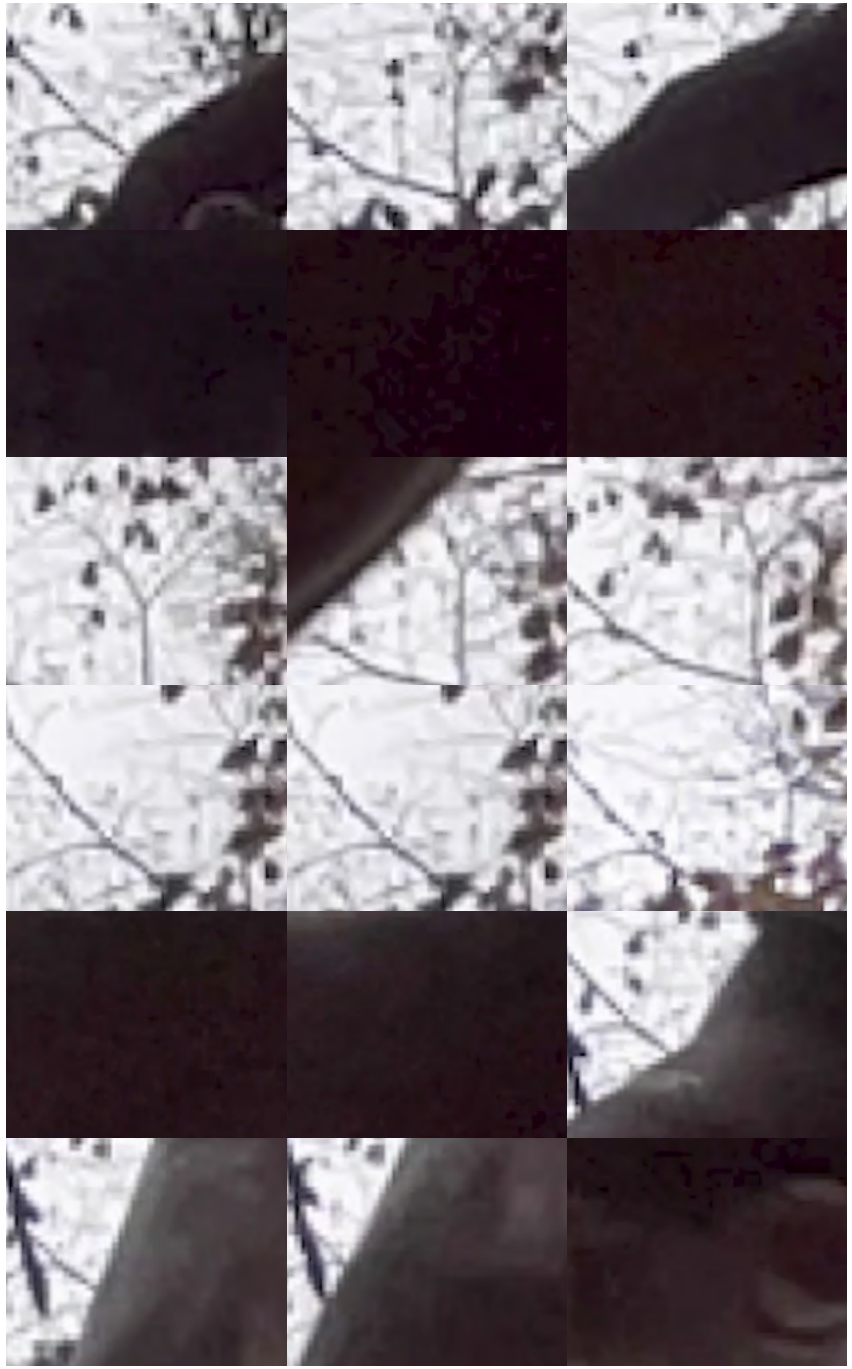
2.5 Designing a Framework for Future Experiments

The framework below serves as a structured response to the research question posed in Chapter 2: **How can narrative agency emerge collaboratively between human, technological, and more-than-human agents?**

Parameter	Critical Question	Spectrum of Possibilities	Expanded Considerations
Scale of Participation	How is narrative agency distributed, and who/what participates?	Singular (one agent, isolated intra-action) → Networked (multiple interacting agents) → Distributed (system-wide, emergent)	Is agency centralized (a single event) or emergent across a field of intra-actions? How do nonhuman actors register participation?
Temporal Framework	How does time condition the emergence of meaning?	Instantaneous (real-time) → Accumulative (hours/days) → Deep Time (geological, ecological, sedimentary)	Does the experiment privilege human timescales, or does it stretch across more-than-human durations? Could meaning sediment rather than appear?
Mode of Narrative Emergence	How does meaning unfold—through inscription, interaction, or intra-action?	Inscribed (fixed, archival) → Interactive (user-dependent) → Intra-active (ongoing material, environmental, and technological entanglements)	Does the experiment attempt to 'capture' meaning, or does it allow meaning to remain unfixed, contingent, and evolving?
Medium of Transduction	How is more-than-human agency made perceptible?	Sonic (vibratory, acoustic transduction) → Visual (photographic, computational image) → Tactile/Material (sculptural, kinetic, organic mediation) → Atmospheric/Environmental (wind, humidity, air quality, barometric shifts)	Does the medium reinforce human-centric perception (e.g., sight and sound), or does it invite new sensory encounters?

Site-Specificity	How does the site itself structure narrative agency?	Fixed (localized, situated intra-actions) → Nomadic (shifts across sites) → Nonlocal (networked, ambient intra-actions)	Does the site impose constraints, affordances, or biases? How does the physical, material, or ecological context shape what is made perceptible?
Degree of Human Mediation	What is the researcher's role?	Fully Autonomous (independent of human activation) → Partially Mediated (subtle human influence) → Co-Created (human presence integral)	Can the system function without human engagement? Does the researcher direct, facilitate, or withdraw?
Mode of Participation	How does participation occur, and is it intentional?	Active → Passive/Ambient → Unintentional	Does participation emerge through attunement rather than control? Could nonhuman entities be considered participants in their own right?
Mediating Apparatus	What structures shape meaning?	Digital (code, AI) → Material (kinetic, sculptural) → Biological (fungal, bacterial) → Atmospheric (wind, humidity)	Does transduction exist outside computational logic?
Ethics of Mediation	Does the system allow openness, control, or unpredictability?	Controlled (designed for specific outcomes) → Semi-Structured (some unpredictability) → Open-Ended (fully emergent)	How much control does the system retain over meaning? Does it allow for the unreadable or resistant?
Failure & Unreadability	Can the experiment resist human interpretation?	Readable → Unreadable → Failure-as-Generative	What happens when data resists human perception, or mediation collapses?
Output & Documentation	What traces remain?	Ephemeral (no record) → Archival (stored documentation) →	Is the purpose to capture,





Rather than a prescriptive tool, the framework functions as a compass, guiding artistic research and experimental methodologies toward emergent possibilities rather than fixed conclusions. It does not aim to resolve the ontological and epistemological tensions inherent in transduction but instead positions them as sites of inquiry—points of ongoing negotiation rather than closure. By structuring key parameters—temporal scale, medium of transduction, participation, site-specificity, and the ethics of mediation—the matrix functions as both a generative tool and a theoretical framework, exposing the inherent biases and structuring forces that shape narrative agency.

3. Final Words: A Story That Never Settles

3.1 Revisiting the Research Question

This inquiry investigated the central question: How can narrative agency emerge collaboratively between human, technological, and more-than-human agents? Through three experimental iterations, I examined how storytelling unfolds when humans are no longer the sole narrators and how technological mediation enables, restricts, or transforms more-than-human narratives.

The answer, showed through this research, is that narrative agency emerges through structured intra-actions—relationships conditioned by technological mediation, environmental forces, and human intervention. Narrative agency does not originate from a singular human author but emerges naturally through the entangled intra-actions of human, technological, and more-than-human agents. Rather than being imposed or extracted, meaning arises from within these relations—conditioned by site, mediation, and material presence. When technological systems, environmental forces, and human intervention align, they create the conditions for shared narrativity—a mode of storytelling that is neither fully controlled nor completely wild, but negotiated across human, technological, and more-than-human boundaries.

The experiments demonstrated this collaborative emergence through distinct mediating processes. In each case, narrative materialized not through representation but through transduction—the translation of one form of data into another, making imperceptible relationships tangible through technological mediation.

3.2 Toward a Post-Anthropocentric Storytelling Framework

This research proposes a shift in how narratives are conceptualized and created:

Stories do not belong to humans alone—they emerge through material interactions and technological mediation.

Technology is not neutral—it both reveals and obscures, making certain narratives possible while erasing others.

Transduction is powerful but limited—it translates more-than-human agency into human-readable formats, raising ethical questions.

Future storytelling methods must embrace emergence, openness, relationality, and liveness rather than focusing on fixing meaning into stable artifacts.

In many ways, this research has been less about telling stories than about attunement—learning to sense, respond to, and engage with the narratives that are already unfolding all around us. It has been about stepping back from the position of the author to become a participant in a much larger, ongoing process of meaning-making. This shift advocates for artistic research as a model where the artist does not impose meaning but creates conditions for meaning to emerge collaboratively.

I am reminded of the words of Karen Barad: "Matter is never a settled matter[26]." Neither are stories. They are not fixed objects to be captured or controlled but dynamic processes that continue to unfold long after our attention has moved elsewhere. The materiality of narrative—whether in computational ghosts, storm-modulated soundscapes, or sonically inscribed images—is never fully stabilized. It remains in flux, open to reinterpretation, reactivation, and reconfiguration.

Like the comet that passed briefly through our skies before returning to the depths of space, narratives extend beyond our perception, carrying traces of past encounters while remaining open to future intra-actions. They exist in relation to us, yet they are not contained by our observations. This is perhaps the most important insight of this research: that storytelling is not about capturing meaning but about creating moments of temporary alignment, where human, technological, and more-than-human agencies briefly intersect before continuing along their separate paths.

The world is already full of narratives—our role is not to impose meaning but to develop methodologies that allow stories to unfold in their own time, space, and form. This is what my research has pursued: not a final word but an ongoing conversation between human, technological, and more-than-human agents. In this sense, the conclusion offered here is not an ending but a pause-a moment of reflection before the story continues to unfold in new and unexpected ways.

[26] Karen Barad, "TransMaterialities: Trans*/Matter/Realities and Queer Political Imaginings," GLQ: A Journal of Lesbian and Gay Studies 21, no. 2–3 (2015), 401

3.3 Overview of Key Findings and Critical Insights

Research Dimension	Key Findings	Theoretical Implications	Future Directions
De Nieuwe Haagse Passage (Arcade)	• Technological mediation shaped narrative structure, privileging architectural stability over human presence • Meaning was fixed post-factum through computational stitching • Human movement appeared as ghostly traces or was entirely erased	• Computational systems act as selective filters and mediators • Technology can impose hierarchies of visibility that reinforce structural permanence	• Develop computational methods that foreground human presence rather than structural stability • Explore real-time computational rendering to mitigate post-factum stabilization
Storm Conall (City Forest)	• Non-human entities (weather systems) demonstrated narrative force • Real-time fluctuations resisted fixity, creating dynamic narratives • Live soundscape transduction created immediate, ephemeral expressions	• Environmental agents can actively shape narrative structure • Real-time intra-actions create fluid, non-fixed meaning	• Design systems that embrace environmental unpredictability rather than attempting to stabilize • Develop methodologies for ephemeral narratives that resist archival capture
Tokyo (Soundscapes)	• Sound functioned as co-author of visual narratives • Sound-structured photography allowed meaning to emerge in real-time • Cross-modal transduction bridged	• Sound can structure visual narratives • Transduction reveals how meaning emerges across sensory boundaries	• Explore non-visual narrative structures across different sensory modalities • Investigate how site-specificity shapes cross-modal narrative emergence
Transduction as Method	• Enabled non-human rhythms to be perceived differently • Required data to be human-readable, revealing inherent biases • Functioned as a structuring force, not a neutral process • Revealed selectivity as an ontological condition of mediation	• All mediation is selective, amplifying certain aspects while silencing others • Human-defined parameters inevitably shape what can be perceived	• Develop transduction methods that acknowledge their biases • Explore non-digital mediation through biological or chemical processes • Investigate how different forms of transduction reveal different aspects of more-than-human agency
Photography Reconceptualized	• Photography functions as a site of intra-action, not representation • Computational photography acts as selective mediation • Sound can structure visual formation • Images function as 'computational fossils' of past meaning	• Photography should be viewed as a medium of mediation, not capture • Materiality is not neutral but actively conditions meaning	• Explore non-visual photography that operates through other sensory registers • Investigate how photographic processes can be designed to embrace rather than fix emergence
Material Ecocriticism	• Matter does not merely 'contain' stories—meaning arises through sensory and technological mediation	• Expands the notion of storied matter beyond literary discourse • Positions mediation as central to material storytelling	• Investigate how different forms of mediation reveal different material narratives • Explore how non-digital materiality might tell stories

Research Dimension	Key Findings	Theoretical Implications	Future Directions
Actor-Network Theory	• Technological biases create imbalances in the network • Computational systems act as filters rather than neutral mediators	• Challenges ANT's flat ontology by revealing power imbalances in technological networks • Shows how digital systems can reinforce hierarchies	• Develop frameworks that acknowledge and address technological biases • Explore how to design networks that distribute agency more equitably
Relational Ontology	• Meaning is never fixed but emerges through intra-actions • Relational conditions enable and shape what intra-actions can occur	• Confirms Barad's view that entities do not preexist their relationships • Shows how technological systems structure the conditions of intra-action	• Investigate how different technological frameworks condition different forms of emergence • Explore how to design for openness while acknowledging structural constraints
Non-Anthropocentric Storytelling	• Human intervention present at every stage of research • Complete nonhuman framing may be impossible	• All storytelling may involve some level of human mediation • This tension is productive rather than limiting	• Explore 'reflexive mediation' systems that foreground their human biases • Investigate methodologies that minimize human intervention while acknowledging its inevitability
Live vs. Fossilized Narratives	• Real-time intra-actions created fluid narratives • Once captured, live data becomes records	• Time is a critical dimension in narrative agency • The act of preservation transforms the nature of meaning	• Develop 'ephemeral narratives' that exist primarily in the moment • Design systems that deliberately transform over time rather than remaining stable
Digital vs. Material Mediation	• Research depended on sensors, software, and algorithms • Non-digital systems may provide alternative narrative frames	• Digital and material mediations structure different forms of narrative emergence • Each reveals and conceals different aspects of more-than-human agency	• Explore truly non-digital transduction methods • Investigate narrative emergence through biological or chemical processes

VII
ACKNOWLEDGEMENTS

I would like to express my gratitude to the Photography & Society program at the Royal Academy of Art, The Hague, for providing a space where research and artistic practice could meaningfully intertwine.

My sincere thanks to Andrea Stultiens and Shadman Shahid whose thoughtful guidance, critical insights, and steady encouragement shaped this thesis in more ways than can be measured.

My heartfelt thanks go to my family, Janke Mulder and David Zwaap, for their enduring support, and to my partner Yuta Mori for grounding me through all stages of this process.

Finally, I thank the sites, systems, and more-than-human collaborators, the memories that shaped this research—the forest, the storm, the city, the comet, the insects, and the sound of wind through rubber bands. Their presence taught me to listen differently, and their stories continue to unfold.

VIII
COLOPHONE

Artistic Research & Documentation	Jeroen Zwaap
Design	Aline Papenheim
Title	Stories Without an Author
Subtitle	Co-creation Beyond the Human

This publication was made in the context
my graduation thesis,
2nd year, Royal Academy of Art (The Hague),
Master of Photography & Society, 2025