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Sweaty Archives – Training the Writing of Bodies in Virtual Spaces¹

Adriana Parente La Selva²
Pieter-Jan Maes³

Abstract

This article explores the concept of the body-as-archive in the context of extended realities (XR). Drawing on a feminist and decolonial epistemological framework, we aim to weave a research methodology for analyzing the rewriting of psychophysical training practices for performers, focusing on the work of actresses Iben Nagel Rasmussen and Roberta Carreri from Odin Teatret (DK) and LUME Teatro (BR). By integrating immersive technologies, we propose new methods for preserving and transforming this form of intangible cultural heritage, addressing challenges in documenting embodied knowledge and promoting intersectional dialogues between culture, body, and technology.

Keywords: Training. Extended realities. Virtual embodiment. Body-as-archive. Odin Teatret.

Archivos sudorosos – entrenando la escritura de cuerpos en el espacio virtual

Resumen

Este artículo explora el concepto del cuerpo-como-archivo dentro de las realidades extendidas (XR). Desde un marco epistemológico feminista y decolonial, buscamos desarrollar una metodología de investigación para estudiar la reescritura de prácticas de entrenamiento psicofísico para performers, centrándonos en el trabajo de las actrices Iben Nagel Rasmussen y Roberta Carreri del Odin Teatret (DK) y LUME Teatro (BR). Al integrar tecnologías inmersivas, proponemos nuevos métodos para preservar y transformar esta forma de patrimonio cultural inmaterial, abordando los desafíos en la documentación de saberes *embodied* y promoviendo diálogos interseccionales entre cultura, cuerpo y tecnología.

Palabras clave: Entrenamiento. Realidades extendidas. Embodiment virtual. Cuerpo-como-archivo. Odin Teatret.

Arquivos suados - treinando a escrita de corpos no espaço virtual



Resumo

Este artigo explora o conceito de corpo-como-arquivo no contexto das realidades estendidas (XR). A partir de um quadro epistemológico feminista e decolonial, buscamos tecer uma metodologia de pesquisa para analisar a reescrita de práticas de treinamento psicofísico para performers, focando no trabalho das atrizes Iben Nagel Rasmussen e Roberta Carreri do Odin Teatret (DK) e do LUME Teatro (BR). Ao integrar novas tecnologias imersivas, propomos novos métodos para preservar e transformar essa forma de patrimônio cultural imaterial, abordando desafios na documentação de saberes *embodied* e promovendo diálogos interseccionais entre cultura, corpo e tecnologia.

Palabras clave: Treinamento. Realidades estendidas. *Embodiment* virtual. Corpo-como-arquivo. Odin Teatret.

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Introduction

Hope lies in the premise that we do not know what will happen and that, in the spaciousness of uncertainty, there is room to act (Solnit, 2016, p.12).

Advancements in technology, information theory, computational modeling, and immersive multisensory displays over the past two decades have positioned the notion of the body-as-archive in a new perspective, particularly concerning performative practices as a form of Intangible Cultural Heritage (ICH). With the advent of new motion capture technologies, interactive digital platforms, and mixed and augmented realities, we encounter possibilities for addressing what has never been easily documented: tacit and embodied knowledge, oral and bodily histories, immaterialities, and that which is volatile and fluid. This historical moment witnesses a confluence of imaginary technologies—a shifting, ethereal network of values and practices shared concretely or virtually (Durand, 2012; Silva, 2003)—and computational and informational technologies.

This article sets out to sweat the idea of body-as-archives through a research project that aims to create an archive to sweat with. Over the last three years, the project “Practicing the Archives of Odin Teatret” (POTA)⁴ has been developing a virtual archive focused on the corporeal practices of the group's performers and, importantly, of the generations that have learned from them and applied these practices in their own contexts, questioning methods of curation, dramaturgy and spatial navigation, the relationship between physical and virtual spaces and interaction in the processes of transmitting and writing embodied knowledge.

Odin Teatret⁵ has developed a rich legacy of performances and cultural

⁴ Practicing Odin Teatret's Archives (POTA from now on) is an interdisciplinary research project funded by the Flanders Research Agency (FWO), and developed at Ghent University collaboratively between the Departments S:PAM (Studies in Performance and Media - Ghent University) and IPEM (Institute for Psychoacoustics and Electronic Music), with the support of Utrecht University (Netherlands), Manchester Metropolitan University (United Kingdom) and Aalborg University (Denmark).

⁵ Odin Teatret is one of the oldest theater groups in the world, with a tradition of research into embodied practices for over sixty years. The group was the main force behind the broader artistic institution known as Nordisk TeaterLaboratorium (NTL) in Denmark, which today is also home to new generations who have built their artistic work in dialogue with Odin's legacy. Over these decades, Odin has built up an extensive archive that is a fundamental source of knowledge for creators, academic students and theater researchers. This archive involves not only the written documents stored over the years of its long history, but also the codified physical training methods that the group has developed over the years to hone the actor's body skills and presence.



activities deeply rooted in embodied practices. Moreover, many of these practices have been highly codified, which in a way has substantially helped us to align them with the precise nature of technology. These practices, which have been passed down over sixty years from actor to actor, researcher to researcher, involving a substantial amount of different cultures in the transformation and recycling of these practices, represent a form of living heritage that is difficult to capture and preserve using traditional archival methods. In this context, preserving *techné* is not about fixing it in time, but about recognizing and incorporating the temporal and cultural transformations that shape its practice. This approach forces us to challenge rigid notions of "right" and "wrong" and instead focus on how these practices evolve through embodied memories and cultural engagements. The aim is to honor the dynamic nature of these legacies, without imposing a colonial framework that seeks catalogues, which end up freezing knowledges in a singular and immutable form.

The POTA project therefore aims to renegotiate Odin Teatret's existing archives by incorporating VR and XR technologies, thus preserving its embodied practices in a way that remains faithful to the group's original epistemological ethos while allowing for transformation and intersectional dialogues with visitors to the archive. This is a major challenge, as it involves translating intangible embodied memories into digital formats that can be interactively experienced by future generations. The project is guided by two main questions: How can we preserve Odin Teatret's embodied legacy without reducing it to mere data? And how can new technologies be used to create meaningful interactions with this translated data - not as mere tools, but as integral components of an epistemological shift in archival practices?

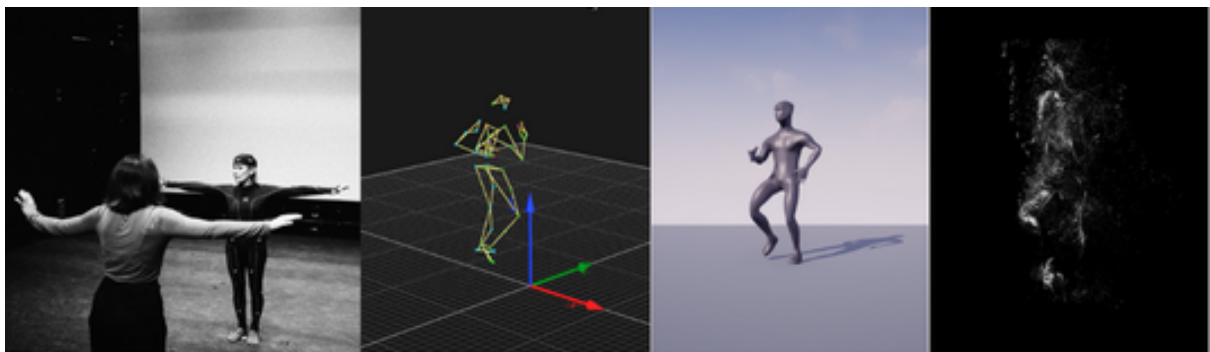
This ongoing research process has so far been an invaluable opportunity to collaborate with practitioners we have always admired⁶. We were privileged to bring to our Art and Science Interaction Lab (ASIL, BE) Roberta Carreri and Iben Nagel Rasmussen, actresses from Odin Teatret, whose artistic and political contributions continue to shape contemporary group theater globally. Both have

⁶ An overview of the project, participants and audiovisual material from the experiments can be found at this link: <https://asil.ugent.be/projects/pota/>

developed their own training practices and are committed to passing on their legacies to long-time students, beyond the walls of Odin Teatret. Many of these students are also involved in this project, and understanding the genealogy of these practices across time and cultures is a fundamental puzzle with which this project is concerned.

Part of this collaboration involves the use of Motion Capture (MoCap) technology to record practitioners' embodied techniques. MoCap is a digital technology that translates the movement of a body into numerical data. Infrared cameras in the laboratory record the three-dimensional trajectories of reflective markers placed on the body or on a tight-fitting suit with submillimeter precision. These markers are transformed into digital data, represented in three-dimensional coordinates, which can be rendered visually in countless ways. Ioulia Marouda, our research colleague, is responsible for translating this data in collaboration with the authors. This translation process is the craft of this research: from data to body design, towards an architectural virtual space that supports a dramaturgical navigation of psychophysical techniques.

Figure 1 - Body translation process using MoCap technologies. From left to right: Roberta Carreri starting a recording, guided by Ioulia Marouda (Photo: Bruno Freire). The sensors seen inside the Qualysis system. A basic avatar of the system. The translation from an interdisciplinary design of the exercise captured. (Last three images: screenshot).



In this article, we will discuss the possibilities of reimagining, intervening and embodied experiences of psychophysical theater training as a feminist methodological approach to cross-modal archives. By exploring the interaction between humans and non-humans, we will highlight how the writing of bodies through augmented technologies facilitates reorientations in our perception of



space and the stories it holds.

Central to our reflection is the observation that the standard devices for organizing such archives are products of specific socio-cultural discourses on knowledge, resulting in approaches that tend to authorize some forms of knowledge, while at the same time displacing and decentralizing knowledge that does not fit easily into the given structures. Given the need to mediate the diversity of knowledge in a global order, an urgent issue is to consider different ways of portraying knowledge in relation to time-space. Are new media technologies capable of reorganizing knowledge frameworks?

Thus, by proposing an exploration of the body-as-archive within a technological process, we seek to examine contemporary strategies for dealing with training practices as narrative vessels that reconfigure archival and intangible epistemologies as objects of social, cultural and political resistance.

Instead of a fixed story or a pre-defined path, narrative vessels are fluid dramaturgical structures that guide the visitor's interaction with embodied stories, allowing for the creation of individual meanings through gestures, movements and sensory experiences. In the context of our research project, we suggest that archives need to be activated bodily in order to make sense. These writings will unfold co-creation tactics, shaped by the textures and constraints of virtual space, to address personal and collective stories based on training practices.

Our argument is inspired by the notion of *sweaty concepts*, developed by critical thinker Sara Ahmed. Her understanding of *sweaty concepts* is deeply rooted in the work of Audre Lorde (Ahmed 2017, p.12). Lorde built an archive of lived experiences of sexism and racism, highlighting the failure of public discourse to acknowledge these realities (Lorde 1988, 2007, 2011):

I have been so energized by her example, and in following Audre Lorde, I also want concepts to show the bodily work of their creation: concepts can be made to sweat when we bring them back to the bodies. Indeed, when a concept comes back to the body it might transform how we inhabit bodies. *Sweaty concepts* might also be understood as concepts that are difficult, that demand we work hard to work with them (Ahmed, 2017, p.18).



For Ahmed, sweaty concepts are more than just abstract ideas; they are deeply embodied, arising from the experiences of those who bear oppression in their own bodies. This notion, therefore, is not just intellectual, but visceral, creating other forms of empathy between bodies that, although they don't share exactly the same kind of suffering, occupy a similar position of exclusion from hegemonic discourses. This connection is not theoretical, but deeply felt and lived in the body.

According to Ahmed, sweaty concepts can save the person who discovers them from the isolating and damaging effects of social exclusion. They are sweaty because they emerge from a body that doesn't feel at home in the world, a body that is always struggling to find its place. Ahmed emphasizes that, contrary to the traditional view in philosophy, concepts are not created in intellectual solitude, but rather as responses to social situations (Ahmed 2017, p.13). Concepts are therefore formed through social interaction and the recognition of shared experiences, and are therefore intrinsically intersubjective and embodied. This perspective pushes us to recognize the body as a site of knowledge that has, over time, been marginalized and excluded from the pages of history.

These stories can help us articulate a different approach to archives.

Let's make the archive sweat, then.

The Epistemological Turn in Living Archives

In 2016, a group of feminists met in Manchester, UK, to explore and discuss the patriarchal impositions inherent in archival practices, underpinned by a certain status of immutable truth and shaping colonial and Western epistemologies throughout history. From the very etymology of the word, as Derrida reminds us (2008), archives are houses for the retention of knowledge, kept by men and accessible only to them. What is selected to be archived has followed this same logic for centuries. The *Manifesto for Feminist Archiving (or Disruption)* (2016) thus emerged from the growing recognition within feminist and activist communities



that traditional archival practices often excluded or marginalized the experiences of women, LGBTQ+ individuals and other underrepresented groups.

More importantly, the manifesto provides us with methodologies that can be tested, applied and contested, generating a lineage of archival practices that recognize the strength of what has long been ignored, such as rituals, *techné* and crafts. Before delving into our case study, it is worth tracing and contextualizing some relevant parts of this lineage for our research, used and tested by us, and recognizing the valuable methodologies that are gaining increasing attention in the field.

The aforementioned manifesto, followed by a series of response-improvement manifestos, proposes the practices of *Intervention* (with existing archive material, addressing its access and interpretation), *Living* (addressing experiential embodiment and contextualization) and *Reimagined* (addressing the reuse and recyclability of documentation in order to reconsider archive structures) as methodologies for rethinking curation. These methodologies are proposed as ruptures in the normative steps within the discipline of archiving.

Five years earlier, Suely Rolnik's seminal text, *Archive Mania* (2011), was published as a response to Derrida's essay, *Archive Fever* (2008), addressing the implications of his reasoning from a feminist and critical perspective, developed by a thinker from the Global South. By reconsidering the geopolitical shift caused by globalization, Rolnik traces Latin American archival practices during the dictatorship decades of the 1960s and 1970s:

In view of this, it is urgent that we problematize the politics of archiving, since there are many different ways of approaching those artistic practices that are being archived. Such politics should be distinguished on the basis of the poetic force that an archiving device can transmit rather than on that of its technical or methodological choices. I am referring here to their ability to enable the archived practices to activate sensible experiences in the present, necessarily different from those that were originally lived, but with an equivalent critical-poetic density. Facing this issue, a question immediately emerges: How can we conceive of an inventory that is able to carry this potential in itself—that is, an archive "for" and not "about" artistic experience or its mere cataloguing in an allegedly objective manner?" (Rolnik, 2011, p.4).

Even earlier, Saidiya Hartman's essay *Venus in Two Acts* (2008) suggests



speculative narrative techniques to deal with the gaps and silences in the historical record, especially in relation to the lives of enslaved African women. Her practice addresses the limitations of the archive through the deliberate use of speculative fiction to imaginatively reconstruct their stories, filling in the gaps left by history with plausible narratives that give voice to those who have been silenced.

Intervention, (Lived) Experience, Reimagination and speculative narratives for an artistic experience with archives. In times of archive fever, which has only intensified with digital technologies that store data at an unprecedented rate, perhaps it's time to reconsider the uses of documentation to rethink intangible stories.

Technological spaces of enunciation

As we said in our introduction, in recent years the field of heritage preservation and archival practices has undergone a profound transformation, reflecting wider cultural and technological changes. This change in perspective is generating several significant transformations in the field. First, there is a growing focus on interaction rather than passive observation, recognizing that engagement with heritage is a dynamic process. Second, the decentralization of archival practices is being facilitated by digital and network technologies, which allow for greater accessibility and inclusion. Third, there is a move away from hierarchical, *top-down* classifications of objects towards an appreciation of embodied knowledge and the cultural contexts in which these objects exist.

On the other hand, while this shift reshapes both what we understand as embodied and archival practices, and despite the immense power and speed of digital archives and databases, they can, paradoxically, be profoundly anti-archival. As Diana Taylor observes, the broadening of our understanding of archives has led to a disconnection between object, place and practice (2024). The instantaneous reproduction of information has increasingly separated content from the means of understanding it, making authentication and verification more challenging. Consequently, concepts such as historical accuracy, authenticity, authorship, intellectual property - and what about embodied property? -, expertise, cultural



value and even an ethos, depend on the archive as a legitimizing source:

This circular legitimating epistemic system again affirms the centrality of place. The archive comes to function not simply as the space of enunciation, the place from which one speaks, but also (and primarily), Foucault noted, as "the law of what can be said" ([1969] 1972:129). Place/thing/practice exist in a tightly bound connection in which each relies on the other for its authority. Each has a different logic and politics of making visible (Taylor, 2024, p.26).

In addition, by following the history that began with the creation of cyberspace, we are witnessing powerful changes in the ways we organize life in this world. Many of these changes make us look on with fear and skepticism, as what was once proposed as a liberating new world has continually trapped us. In 1996, John Perry Barlow declared cyberspace to be a free and independent space, where governments have no power and " all may enter without privilege or prejudice accorded by race, economic power, military force, or station of birth " (Barlow, 2016, *online*). Barlow, founder of the Electronic Frontier Foundation, published the statement while the US government was trying to pass a new Telecommunications Act, which would deregulate internet ownership: "Your legal concepts of ownership, expression, identity, movement and context do not apply to us. They are all based on matter, and there is no matter here" (Barlow, 2016, *online*).

Now, as cyberspace turns into virtual spaces following the same capitalist rules, and expression and movement are increasingly monitored by the companies that have settled in it, such projects like POTA signal the creation of new geopolitical practices within performance training which, according to Dixon, should enroll "not only the diverse expertises of the sciences and the arts, but also the agency of elements and biota, and that takes responsibility for a "caring" approach to how these are called upon in the making of new worlds" (2016, 161).

Figure 2 - Performers who visited the laboratory during the first stage of the project. From left to right: Iben Nagel Rasmussen, Roberta Carreri, Patrick Campbell, Mika Juusela, Luis Alonso-Aude, Gonzalo Alarcón and Marije Nie. (Photos 1 to 4: Bruno Freire, Photos 5 to 7: Adriana La Selva).



Reimagining archives of the intangible through cross-modal methods therefore creates an exciting and stimulating scenario, but also raises epistemological debates. In this context, the questions of what to archive, where to do it and why anyone would do it at all are important political issues that need to be revisited in order to propose new ways of safeguarding, transmitting and transforming these forms of knowledge.

XR: Immersive Imaginary Worlds and Enhanced Presence

Technically, XR (Extended Realities)⁷ is defined by its ability to create immersive experiences, usually through multi-sensory systems (mainly visual and auditory), allowing users to perceive computer-generated environments from a first-person perspective. While this is fascinating, the psychological and bodily impacts of such immersion are even more intriguing.

The concept of *presence* - the psychophysical experience of *being there* in an environment - can be broken down into several dimensions, including *telepresence* (the feeling of being in a virtual environment), *social presence* (the

⁷ XR is an umbrella term that covers different forms of human-machine interaction, such as VR (virtual reality) (fully immersive experiences), AR (augmented reality) (experiences that visualize the real with the interference of digital objects, for example, holograms) and MR (mixed reality), which is a broader term that refers to hybrids of AR and VR.



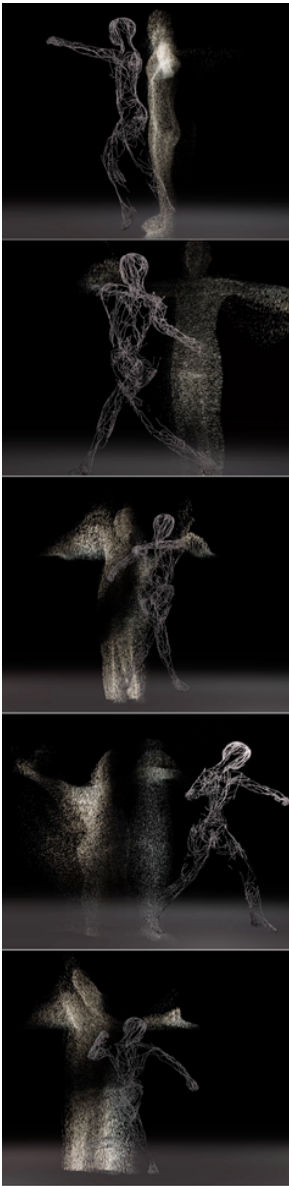
feeling of being together with other people) and *bodily presence* (the feeling of inhabiting another body). As discussed by Maes (2024), presence is fundamentally rooted in the manipulation of action-perception couplings, which are integral to our interaction with naturalistic environments.

Throughout history, humanity has sought to create immersive imaginary worlds, with different media serving this purpose (Grau, 2003). However, XR technology introduces a disruptive innovation by adding a somatosensory dimension to these experiences. By hacking the action-perception coupling, XR offers genuine bodily interaction with these imaginary worlds, fulfilling an ancient human desire.

The emergence of virtual archives raises profound questions about the nature of presence, identity and embodiment. In these spaces, the physical body is replaced by a virtual avatar, which functions as a trace - an ephemeral remnant of a more extensive process of transmission. Much like oral traditions and embodied practices of knowledge transfer, which rely on the body as a vessel for memory, the virtual avatar serves as both a substitute for and an echo of the physical self. However, this avatar is not just a static representation; it embodies a dynamic process of abstraction, challenging our notions of what is real or authentic. Whether we are confronted by an artist-pedagogue in physical proximity or by a detailed video simulation, the transformation of this encounter into the virtual realm radically disrupts our conventional ways of seeing, perceiving and relating to the Other.

This change invites us to reconsider the very architecture of embodied transmission. Can the essence of this process be re-situated in new constructed digital environments? What are the implications of these virtual architectures for the preservation and transmission of knowledge that historically depended on the physicality of bodies and spaces? When interacting with these virtual environments, what new relationships, dialogues and understandings emerge about how we access and produce knowledge?

Remains, flesh and bones



Rebecca Schneider invites us to rethink the notion of performance remains as a way of challenging dominant narratives and opening up new possibilities for understanding the past. Instead of seeing performance as something that disappears, she encourages us to approach it both as "the act of remaining" and as "a means of reappearance and participation" (Schneider, 2012, p.71). And so, in remaining, we sit in a liminal space and time where archive and repertoire meet. This space, we suggest, is the space of training, the driving force behind the POTA project.

Schneider's concept of remains challenges the traditional archival logic that privileges discrete material remnants - such as documents or, bones - over the embodied and ephemeral traces of spectularity, which she refers to as flesh. In this sense, remains are not inert artifacts, but living traces, continually performed and re-enacted through the performing arts and memory.

Schneider suggests that remains are constituted by both disappearance and preservation, pointing to the idea that spectularity, although it seems to disappear at the moment of its realization, leaves a residue - a living memory within the flesh.

Figure 3 - Screenshots of the translation of the translation of the out-of-balance exercise, where traces of the body *remain* in virtual space.

This notion breaks with the archive's attempt to contain and control memory only through tangible and visible traces. Instead, it opens up space to consider how archives might accommodate performative remains, the lived experiences and collective memories that exist beyond the document, in the bodies and gestures that continue to preserve and transmit knowledge. In this way, remains become fluid and relational, actively disrupting and embodying particular histories through a situated speculative dialogue with the archive, constructed as an experiential architecture of access (Schneider, 2012).

Architectures of access (the physical aspect of books, bookcases, glass display cases, or even the request desk at an archive) place us in particular experiential relations to knowledge. Those architectures also impact the knowledge imparted. [...] In line with this configuration, performance is the mode of any architecture or environment of access (one performs a mode of access in the archive; one performs a mode of access at a theatre; one performs a mode of access on the dance floor; one performs a mode of access on a battlefield). In this sense, too, performance does not disappear. In the archive, the performance of access is a ritual act that, by occlusion and inclusion, scripts the depreciation of (and registers as disappeared) other modes of access (Schneider, 2012, p.75).

In order to *perform a mode of access*, we envisioned an archive that transcends the traditional frameworks of knowledge control and dissemination. In such an archive, visitors are invited to interact and dialogue with the traces of embodied practices - not as static objects of study, but as dynamic acts of training translated and performed by practitioners within the virtual environment. POTA's virtual architectural space (the paradoxically bony structure of the archive) evokes traces of practices. They open up the possibility for psychophysical training to be re-fleshed in other bodies, reappearing, but always in differently. What Schneider calls *performance remains* are, in fact, trainings.

Philosopher David Chalmers has provocatively questioned whether virtual reality can be considered a genuine reality (2022). This investigation forces us to confront not only the metaphysical status of virtual experiences, but also the ways in which they shape our understanding of presence. In virtual reality, the user occupies a hybrid space that mixes real and virtual elements, producing a new kind of performative presence. So what does it mean to experience presence in an archive designed to dialogue with ephemeral traces of embodied practices?

Other dialogues

Dialogue is traditionally understood as a verbal exchange between individuals, involving the reciprocal sharing of information. However, this view often neglects the importance of non-verbal and bodily interactions, which are also loaded with contextual and cultural meanings. Both the verbal and non-verbal components of dialogue have an expressive dimension, which is crucially linked to elements such



as intonation, timing and physical gestures.

Despite this complexity, the conventional concept of dialogue remains predominantly confined to human interaction. However, we propose that the notion of dialogue can be expanded beyond human exchanges to include interactions with the wider world, including inanimate objects, natural phenomena and environmental forces. This extension bridges the gap between artistic expressions and the principles of cognitive science, particularly through the lens of action-perception coupling - a concept that views interaction as a continuous cycle of action and response (Noë, 2006).

In music, for example, this dialogue is evident in the interaction between the musician and the instrument: an action (such as strumming a string) provokes a response (a sound, audience reaction, etc.), creating an evolving feedback loop. Mastery in this context involves learning to regulate one's actions within an environment full of sensory stimuli - what cognitive scientists describe as the "mastery of sensorimotor contingencies" (O'Reagan and Noë, 2001).

Dialogue as perception

In the performing arts, the concepts of mediation and dialogue differ. Performers interact with forces such as gravity, other bodies and objects, using their somatosensory system to navigate these interactions. For example, the force of gravity or the imaginary resistance of ice underfoot, wind or water, fundamentally influences the kinesthetics of movement, exemplifying what are called *environmental constraints* (Newell, 1986). These restrictions shape the dialogue between the performer and the environment, forming a complex cycle of action, environmental response, perception and adaptation.

However, the emergence of Extended Realities raises the question: to what extent can XR create environments that offer new possibilities for such sensory dialogue at its core? Understanding the potential of XR requires examining its technological foundations and the ways in which it fosters new dimensions of psychological and bodily presence.

Now, in other articles, we have already accounted for many laboratory



experiences with Odin Teatret performers⁸. However, during this project, another story began, a new collaboration that shifted our research into other territories and, in turn, brought many insights into our research agenda. LUME Teatro has a history intrinsically linked to Odin Teatret and has worked for the last 40 years in Brazil, incorporating but fundamentally adapting practices that have their roots in Western European forms of training to other realities, other bodies and other cultures, often under-represented in official archives.⁹

Their participation in this final phase of the project opened up a series of possibilities for questioning and reinventing our methods so far. After so many interactions with the possibilities of MoCap, we began to question and explore what it means to *feel* an archive and how techniques can be experienced through cross-modal interactions with extended realities. This involved recognizing the agency of the archive itself, allowing it to respond and provide feedback on a sensory level. By engaging with a series of new sessions with the group, we challenged ourselves to go beyond what is now known as traditional methods in XR documentation. Instead of following MoCap's procedures for recording and translating movement, we began to reimagine such documentation following our own disruptive agenda, further sweating the feminist tactics explored above.

- **Thermal Feedback:** Experiments in this modality aim to understand the complexity of the notion of energy within performance studies. LUME's work, especially in its early years of research, revolves around harnessing and shaping the energy generated within the body during exercises aimed at reaching states of exhaustion as portals to new expressive materials. When asked about their experience of this other energetic state, they say that they start with the physicality of their body, which transforms into sensation and, finally, feeling. Naomi Silman, a member of the group, refers to this process as a way of "sculpting in time and space" (Silman, 2024), of reconnecting with one's body and expressing it through movement.

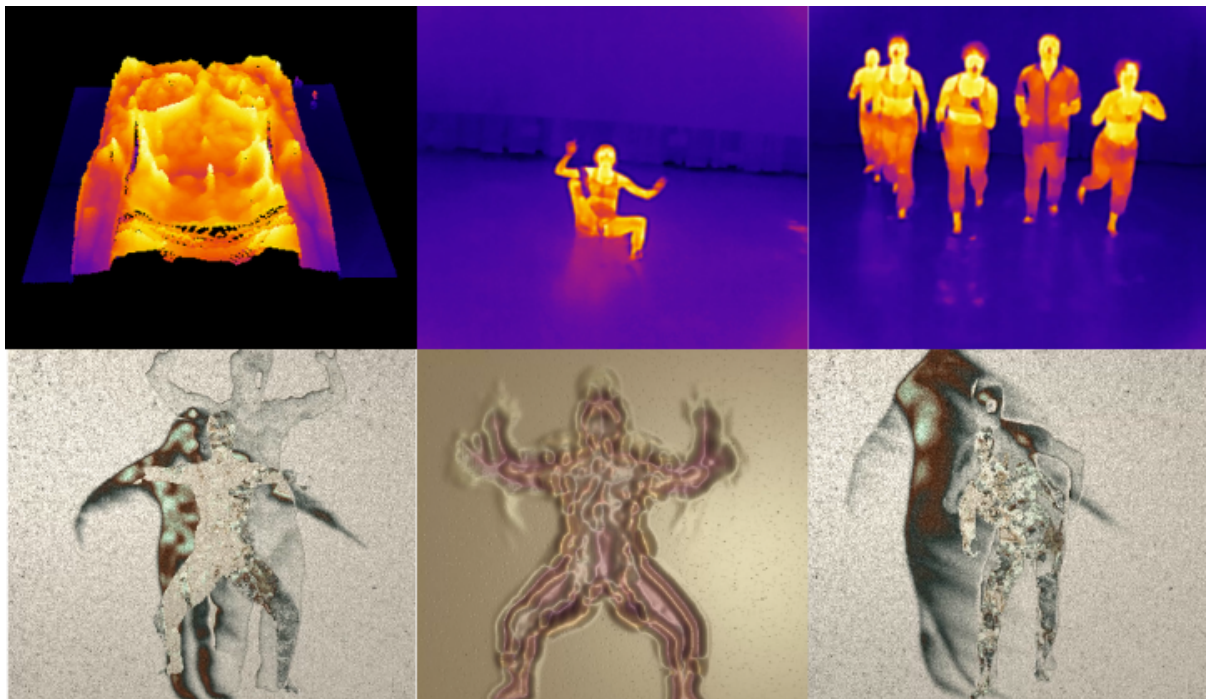
To find ways of translating this process, we started improvising with

⁸ See La Selva (2023) and Marouda, et.al (2023).

⁹ For more information on LUME Teatro's work processes, see Turner and Campbell, 2021 and Ferracini et al., 2020

portable thermal cameras. Ioulia Marouda started creating some digital programming sketches by working with thermal camera footage to visualize the energy expenditure of the LUME actors in an abstract way. The idea behind the sketches revolves around feedback. An abstract version of the performer's body is shown in real time, but overlays traces of their previous positions on the screen. As the movements progress, the feedback becomes more intricate. By recognizing visitors' body heat as they train with the archive, the system responds by generating varying levels of complexity within a given practice, adapting to the thermal signals detected.

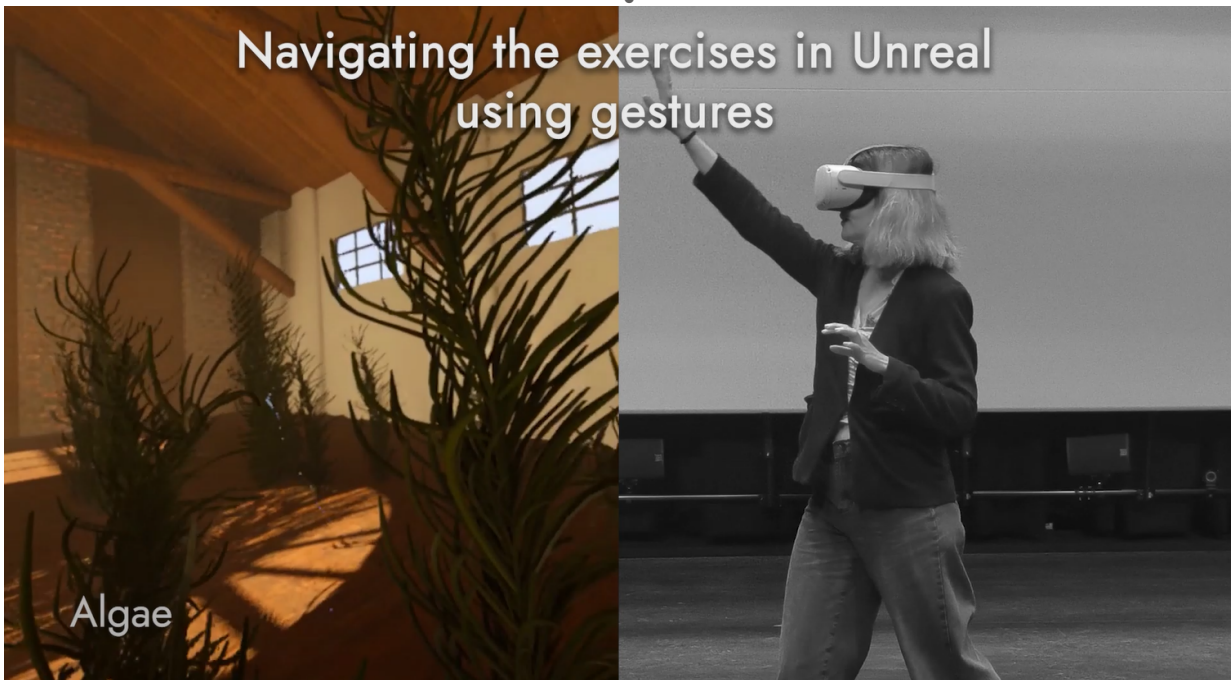
Figure 4 - Screenshots recording the use of a thermal camera during training with LUME (above), and feedback via a system developed by Ioulia Marouda (below)



- **Gesture recognition:** One of the main concerns in our exploration of the archive is how we initiate interaction. In an age where keywords dominate the way we navigate information, the concept of search has become synonymous with language. Keywords are assumed to have the power to unlock knowledge, and information retrieval depends on entering the right combination of terms (Jucan *et al.*, 2019). However, this language-driven approach ignores the embodied nature of our archived documents. What if,

instead of relying on written language, we reimagined entry into the archive through bodily gestures? In this scenario, movement becomes the *key* – a key action – that unlocks specific knowledge. Each gesture, rather than a word or phrase, evokes practices and brings to light knowledge encoded not in text, but in the movements and actions of the body.

Figure 5 - Screenshot showing navigation system developed from gesture recognition.



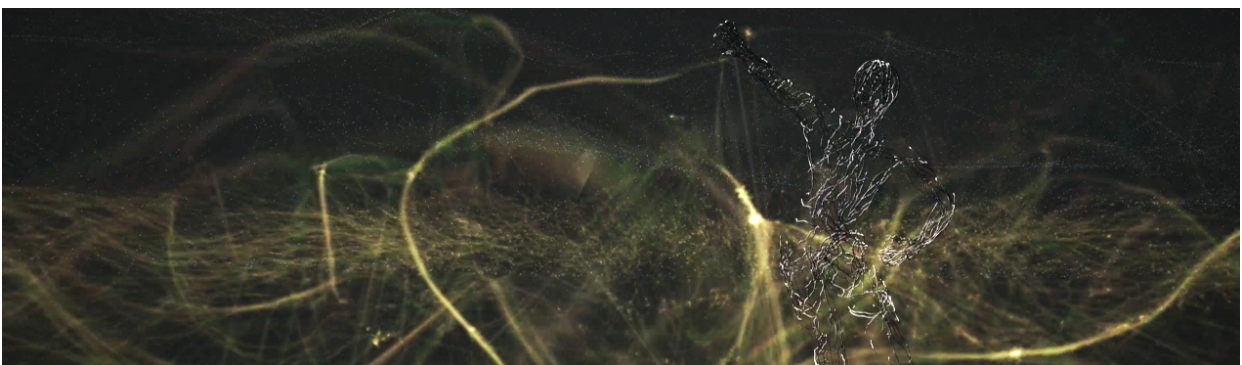
After several iterations with the recorded data and a long period of resistance and skepticism, we finally adopted a program that uses gesture recognition via an AI model as a new entry point for navigating the archive. The current capabilities of AI allow us to classify and interpret movements based on gestures, creating a simplified taxonomy primarily focused on hand movements. This experiment acknowledges that gestures only partially represent the complexity of an exercise. Despite this limitation, and because this is only a research project, we have found out that the simplicity and inherent ambiguity of the performed gestures can cultivate an oracular and dialogical relationship with the virtual archive- through our gestures, the archive gifts us back with particular embodied documents, which were not previously searched for through written language. The kinesthetic qualities of the visitor's gestures are read and connected to a database of exercises which

approach movement through the same qualities. Activating this first event in the archive triggers the construction of one's own dramaturgy within it, one's own training routine.

- **Textural Environments:** Based on our concept of affective topologies, we are investigating how resistance is experienced in virtual spaces through the creation of textural environments¹⁰. These environments impose restrictions on the visitor, influencing the quality and intensity of their interactions, effectively shaping their engagement with the archive. In our virtual archive, textures are designed to defy conventional physical laws, inviting visitors to explore the invisible forces that shape their interactions. By engaging with these (im)material virtual spaces, visitors are encouraged to interact, as if they could sculpt the air itself, experiencing different types of resistance in real time.

These environments are deliberate creations - an intricate web continually refined to establish the right constraints that unlock new potentials and energetic states for participants, promoting a dynamic and porous exchange. To engage with these environments, as we have argued elsewhere, is to "align one's actions in counterpoint to the modulations of the designed textures, understanding the affordances - the potential - of the virtual for theatre training" (Marouda et al., 2023, p.60-61).

Figure 6 - Screenshot showing an avatar interacting with the textural environment in the exercise *Six States of Water* by Roberta Carreri.



Further, to expand the dramaturgy at play in the construction of this

¹⁰ See La Selva (2023).



project's virtual archive, we have borrowed the slightly more complex term *archi-texture* from a long lineage of critical spatial studies which understand space as a communicative fabric, a meshwork which deems space as ongoing. Departing from Henri Lefebvre's *Production of Space* (1974), which looks at how human and non-human actions and rhythms are imprinted in lived space, Ingold expands the notion of texture to environmental studies, understood as lines of flow which assign the "conditions of possibility" for relations to happen (Ingold, 2010, p.21). His understanding of archi-texture thus refers to the idea that environments are not static, finished products, but rather a dynamic, ongoing process of making and unmaking, weaving relationships between people, materials and the natural world. Such archi-textures presuppose an ongoing shaping and creating, activated by relational practices, emphasizing the need to consider cultural and social contexts in the creation of buildings and environmental structures. In a way, we tried to apply this textural notion in a concrete way in our archive, through *design*, creating possibilities for interaction with the (im)materiality of virtual environments. The archive's textures are responsive, creating a mode of non-verbal communication with visitors through kinesthetic and sensitive algorithmic translations of embodied knowledge. The POTA archive thus becomes more than a repository of static data or a place of historical preservation; it is an echo chamber reverberating traces through space and time.

● **What about the eyes?** We remember Roberta Carreri arriving on the first day of recording with MoCap in our lab, wearing the tight and complicated suit full of markers and getting ready for the first recording. When we asked her to start moving freely around the space, as a first test to make sure the system was capturing her movements, she looked at us and said:

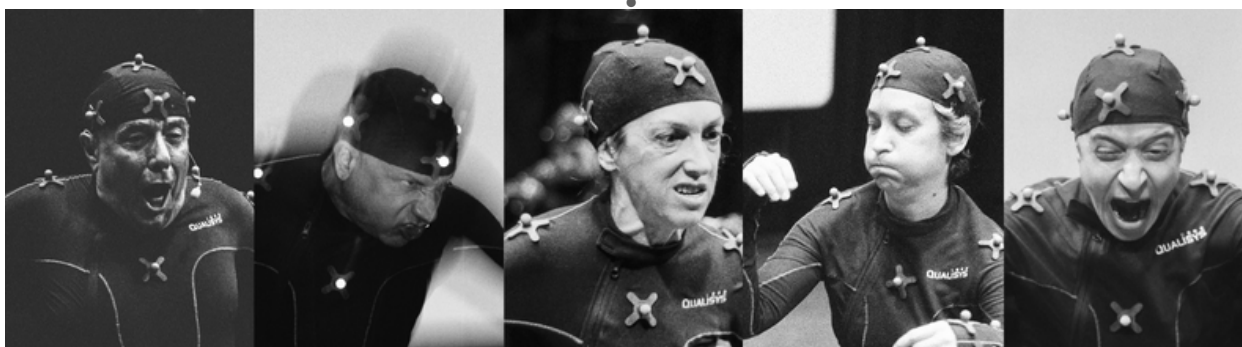
- But what about the eyes? How is this system going to capture the most important aspect of my lifelong research in theater?
- "..."

She was the first to visit us. After that, what happened was that we received the same question over and over again from all the practitioners who visited

US.

This is a short intermezzo just to say that, as we've already read above, there are countless stories that have been neglected, discarded and ignored by archivists, and this calls for radical repair. Some other things, however, are perhaps destined to remain a mystery, only revealed by sweating it out together.

Figure 7 - Facial expressions of LUME actors during MoCap recordings at ASIL. From left to right: Carlos Simioni, Renato Ferracini, Naomi Silman, Ana Cristina Colla and Raquel Scotti Hirson (Photos: Bruno Freire).



The remains of the so-far

As our project comes to an end, we begin to realize what will remain.

When this project began, we had a clear idea of how it would all be possible: Let's capture the movements of these incredible practitioners, talk to them, learn from them, trace their genealogies and those who now sustain their legacies, put all the data into a computer and translate it into virtual scenarios. Easy, right? In the first three months, we produced an immense amount of motion capture data, dissected their embodied knowledge in the lab, recorded, piece by piece, their practices and the paths to them. And then, a year later, we managed to translate one exercise! One exercise in VR! The dream of creating an incredible and complete archive came crashing down. And that was probably the best thing that ever happened to us. Because we realized that we were following the same linear, colonizing, patriarchal logic that we were trying to distance ourselves from.

Without the pressure and commitment to produce something, we end up producing another research agenda, informed by other knowledges. We reinvented research, reimagined data as non-linear, fragmented and oracular remains. We

experimented with other methodologies and in other spaces. We intervened in our expectations and those of academia.

And so we created a different kind of embodied training for ourselves, involving, yes, computers, tables, chairs and office-like spaces, but which had to be reorganized so that we could dance around them, between cables and headsets, creating a collection of bruises on our legs from bumping into objects we couldn't see in our path. And adjusting the control panels and dashboards of video game design softwares, poetically named *Particle Lifespan* or *Enable Actor Snapping* or simply *Chaos...* with random numbers, creating algorithms that would adjust the forces of virtual design to something that made sense as a faithful interaction with exercises such as *wind dance*, *out of balance*, *catching a butterfly*, *house of rhythm*, or *samurai...* That was the technological precision we were dealing with.

Eventually, this training-and because training (as it has always been in theater) also means Intervention, Experiencing, Reimagining and speculative narratives for an artistic experience- this *new* training, dialogical by nature, offered us opportunities to articulate our epistemological space.

Figure 8 - One of Harry Fisk's maps (1944) fascinatingly depicting thousands of years of fluctuations of the Mississippi River through space and time in a single image (Public domain).





As an experiment, this research into virtual embodiment contributes dialectically to new approaches to archiving practices in technological environments, as much as to psychophysical embodiment, in that it has reshaped for the practitioners themselves their practices, leading them to rethink the use of their sweat for other purposes, in other contexts that reterritorialize performative presence. As critical media theorist Tung-Hui Hu put it, " even as digital networks seem to annihilate or deterritorialize physical space, space seems to continually reappear, often as an unwanted flaw in the system " (Hu, 2015, p.4).

Rewriting bodies implies rewriting spaces. As bodies move, interact and perform, they leave traces-remains that redefine not only memory, but also the physical and virtual spaces where these actions take place. Within our project, we came to the conclusion that the exploration of presence in virtual space fundamentally affects the way memory and knowledge are stored. Just as Ingold's concept of archi-texture defines environments as dynamic and fluid processes, shaped by human and non-human interactions, rewriting bodies requires a constant remodeling of space, whether material or digital. This mutual inscription of body and space, as part of a continuous process of transformation, challenges the static, document-centered logic of traditional patriarchal archives. Instead, it opens up new possibilities for relational and performative modes of transmission, focused on disrupting conventional understandings of knowledge.

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