

Virtual reality (VR) has emerged as a powerful medium for artistic and theatrical experimentation, transforming narrative, space, and perception. *Oneironautica III: Estrangement*, the latest iteration in the *Oneironautica* series, immerses participants in a digitally rendered theatre auditorium using point-cloud aesthetics and volumetric scanning to evoke themes of fragmentation, impermanence, and estrangement. Inspired by lucid dreaming, the experience invites users to explore surreal environments shaped by instability and transformation. At its core, the piece stages four of Franz Kafka's parables as audio-visual sculptures, blending literature, sound, and spatial abstraction. These concise yet dense narratives explore alienation, identity, and the tension between self and others – resonating with the dreamlike and introspective quality of the VR environment. Participants engage as roving spectators, activating and revealing story-worlds through embodied interaction, while the point cloud aesthetic reinforces a sense of vulnerability, ambiguity, and disintegration. This paper outlines the conceptual, aesthetic, and technical foundations of the work.

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By situating it within the broader trajectory of VR theatre and analyzing its narrative and interaction design, it highlights how immersive technologies can meaningfully expand theatrical form, spectatorship, and dramaturgical experimentation.

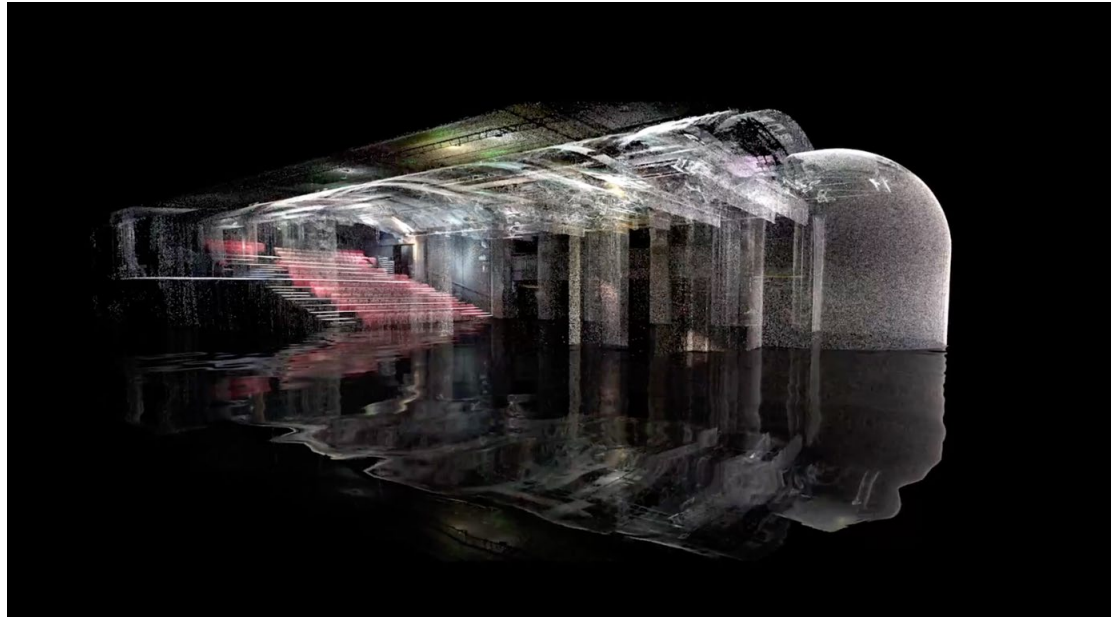


Fig. 1. The first version of *Oneironautica*.

Context and Previous Versions

The interactive VR experience *Oneironautica III: Estrangement* is the latest edition of the *Oneironautica* series, developed by Laurenz Ulrich in collaboration with MIREVI and *Theater an der Ruhr* as part of the project *Theatre of Extended Realities* (2021). In line with the project's goals, this VR piece explores the concept of virtual theatre, pushing the boundaries of storytelling and aesthetic experience beyond traditional stage formats. It engages directly with the growing possibilities offered by new technologies, opening new perspectives on perception, representation, and consciousness.

Theatre is well suited to experiment with new technologies and use them to challenge our understanding of reality and cultural practices. The project addresses several key questions: How can theatre move beyond traditional formats and blur the boundaries between physical and virtual space? How do technologies reshape storytelling and performance? What aesthetic and dramaturgical consequences follow from incorporating digital media? How do such interventions affect the live, collective experience shared by performers and audiences? And how do AI and other technologies reshape our lives and creative practices? These questions are central to the project and informed the conceptualization of *Oneironautica III*.

The initial immersive 3D installation *Oneironautica* was developed by Laurenz Ulrich, a graduate of the Robert Schumann Academy of

Music and Düsseldorf University of Applied Sciences, as part of his Bachelor's thesis. His goal was to contribute to a scholarly understanding of the artistic potential of volumetric recording and point-cloud data (Ulrich 2023). Two artists emerged as key influences due to their pioneering work with point-cloud aesthetics. Ruben Frosali's *Future Cities* presents dreamlike, fragmented urban landscapes (Frosali 2018), while *Dissolving Realities* depicts Vietnamese alleyways that disintegrate upon interaction, evoking impermanence (Frosali 2020). Benjamin Bardou explores perception and memory through digital film and matte painting. Influenced by Walter Benjamin and Baudelaire's reflections on urban life, his *Megapolis* series visualizes cities as dreamlike sequences using point clouds to simulate memory (Bardou 2020). Both artists offered aesthetic and conceptual frameworks that shaped *Oneironautica*, particularly regarding memory, spatial dissolution, and immersive storytelling.

Building on the dreamlike qualities of point clouds, the VR experience *Oneironautica* simulates the audiovisual sensation of waking from a lucid dream. Unlike ordinary dreams, lucid dreams allow a degree of awareness and control, yet remain unpredictable, with shifting environments and fleeting agency (Green and MacCreery 1996). This in-between consciousness inspired the project. VR mirrors this paradox – its immersive quality contrasts with an awareness of artificiality. Rather than seeing this as a limitation, the project embraces it. Interaction design mimics dreamlike exploration, while the unstable point-cloud world reinforces the inevitable dissolution of dreams into wakefulness.

Ulrich chose the *Theater an der Ruhr* as the setting due to theatre's parallels with dreaming – both are ephemeral, immersive, and blur fiction and reality, reshaping time, space, and identity. The final experience mirrors a lucid dream, with participants navigating a point-cloud theatre, encountering ghostly figures, and hearing echoes of past performances. The environment dynamically responds to their movements before gradually dissolving. This interactive VR installation became the foundation for future iterations in which the virtual stage evolves with new content (Fig. 1). Two subsequent versions have been developed in alignment with thematic focuses of *Theater an der Ruhr*'s season, within the framework of the *Theatre of Extended Realities* project.

The second version, *Oneironautica II*, expanded the installation with a digital dance performance by two avatars choreographed by Charlotte Triebus. Developed with the 2023/2024 season's theme *Rausch* (Intoxication or Ecstasy) in mind, it examined themes of logic,

control, and distorted perception, situating users within a narrative that explored toxic-transformative dependencies. Featuring excerpts from Anselm Neft's play *Vom Licht*, the piece continued the journey through surreal dreamscapes.

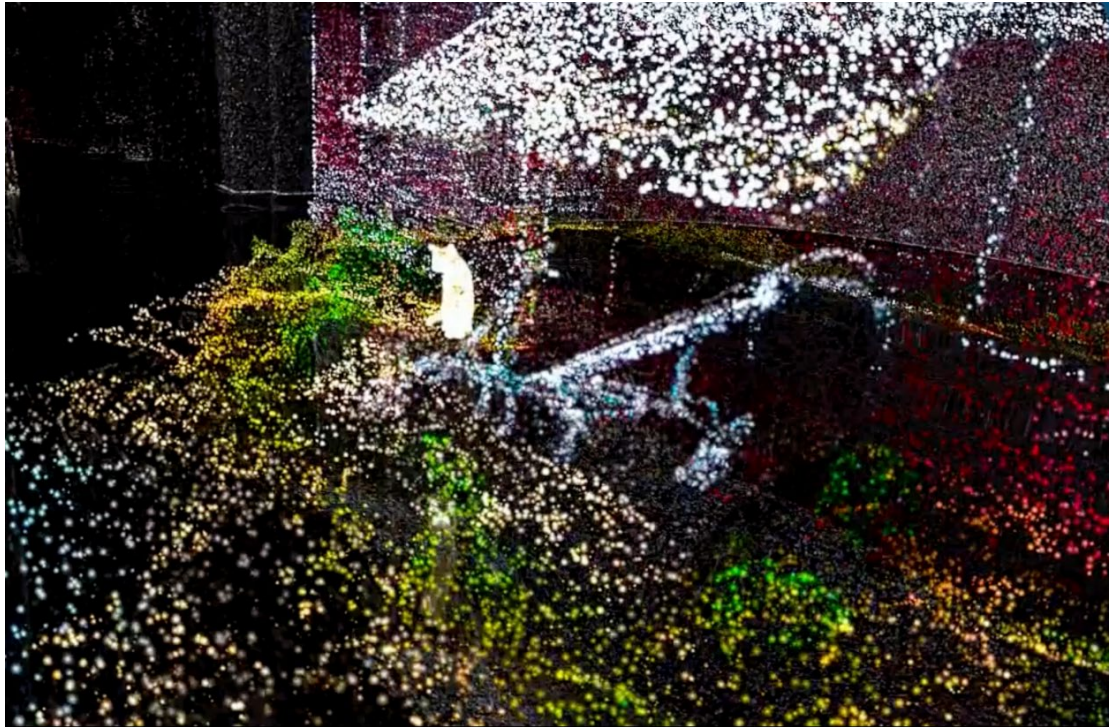


Fig. 2. The house in *Homecoming*.

Description of Oneironautica III

VR Experience

Oneironautica III: Estrangement represents the most complex and thematically rich iteration of the series. Developed within the framework of the 2024/2025 theatre season at *Theater an der Ruhr*, which revolves around the theme *Geheimnis (Secret)* – ranging from the intimate to the political – the piece explores notions of concealment, ambiguity, and inner fragmentation through an immersive dreamscape inspired by Franz Kafka's parables. Visitors experience the VR piece wearing a Meta Quest 3 headset while seated on a swivel chair. The experience begins in a vast, dark-blue space, evoking night's stillness and the transition into sleep. A male voice whispers lines from Kafka's short story *At Night*, setting a meditative tone (Kafka 2007). After a while, a bright blue cloud-like portal appears before the viewer. One may choose to wait until the whispered narrative concludes before being drawn into the portal or enter it earlier at will.

Upon entering, the scene transitions to a theatre stage rendered in point cloud aesthetics, gradually assembling before the viewer's eyes. A cacophony of indistinguishable voices fills the space, while four abstract point clouds appear at the edges of the stage, suggesting a presence of figures or objects. As the viewer moves toward

any of these forms using the controller, one of the surrounding voices gradually sharpens into clarity, while the point cloud takes on a recognizable form. Upon reaching it, one of Kafka's parables – Homecoming, The Bridge, The Vulture, or The Fellowship (Kafka, 2007) – is retold by a male or female voice, while the central motif of the story materializes before them. One can choose to stay and listen until the story concludes or continue exploring other areas of the stage. Each representation subtly reinforces the essence of its tale: the house in Homecoming remains inaccessible (Fig. 2), the bridge can be stepped on and crossed, the figures in The Fellowship turn away in indifference (Fig. 3), and the vulture looms ominously overhead (Fig. 4). Regardless of whether all four stories have been experienced, after eight minutes, the theatre scene begins to slowly disintegrate, mirroring the inescapable pull of awakening from a dream (Fig. 5).

As the surroundings completely dissolve, the viewer finds themselves once again in the vast blue void. The same whispering voice returns, this time reciting an excerpt from Kafka's *Letters 1902–1924* (Kafka 1994), serving as a reflective outro.

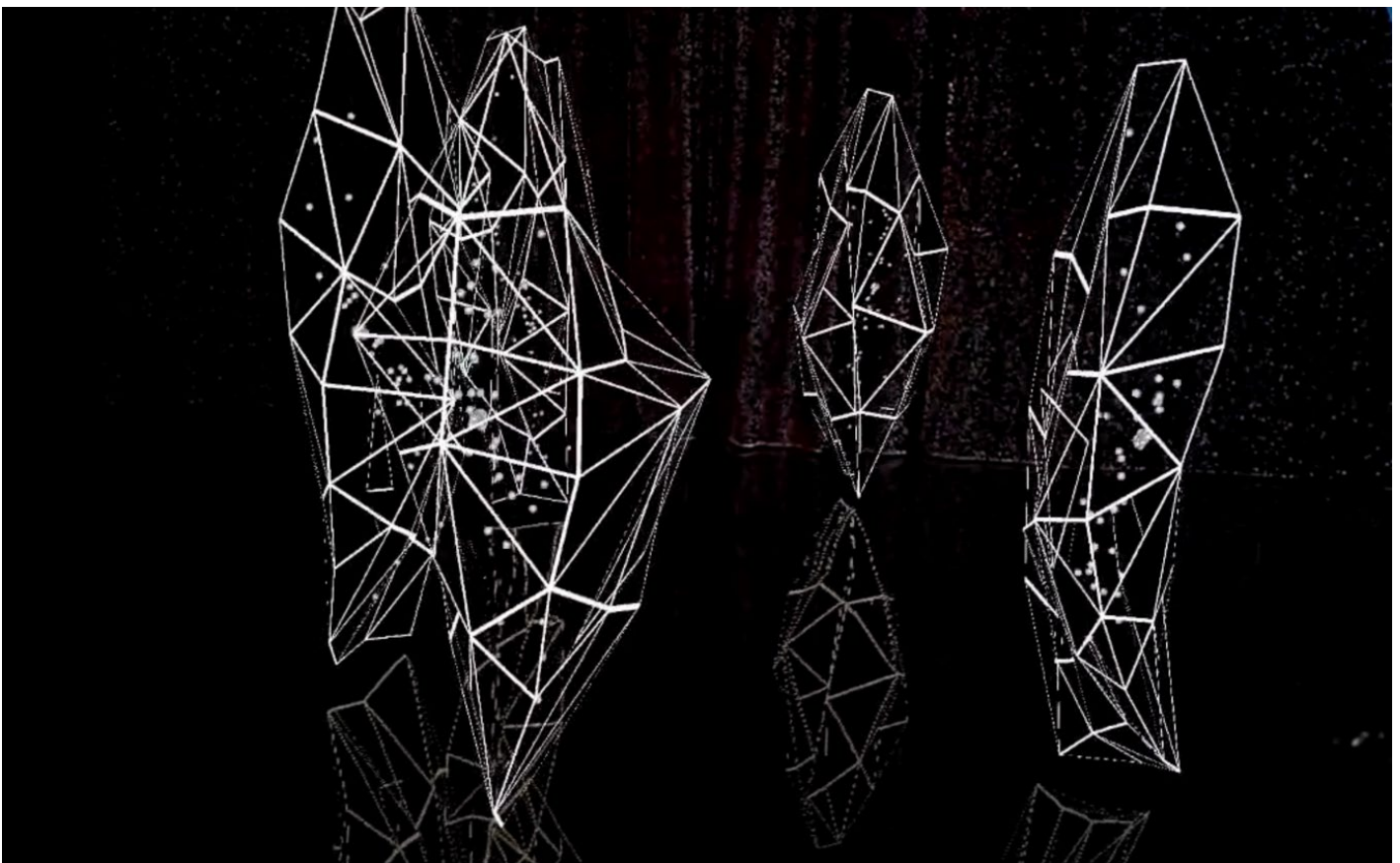


Fig. 3. The figures in *The Fellowship*.

Kafka's Parables

The selection of Kafka's short stories is both conceptually and personally motivated. Each parable offers a uniquely condensed, symbol-rich exploration of the theme of secrecy, closely aligning with the



Fig. 4. The vulture looms ominously overhead.

2024/2025 season's focus. What unites these narratives is their subtle engagement with forms of concealment – some parables reflect estrangement from the self, some hint at unspoken tensions within close relationships, while others explore the hidden expectations that shape our roles in social settings. In *Homecoming*, the protagonist's sense of alienation hints at an unbridgeable gap between self and origin. *The Bridge* introduces a structural metaphor for fragility and self-sacrifice in the face of invisible burdens. *The Vulture* stages a confrontation with a silent, invasive threat that may reflect suppressed fears or guilt. *The Fellowship* evokes the pain of exclusion from a group whose criteria remain unclear – mirroring social concealment and passive rejection.

As parables, their brevity contrasts with their depth, creating encapsulated worlds that resemble dream fragments – fleeting yet intense, each carrying its own internal logic. Beyond their thematic relevance, Kafka's texts were also chosen due to a personal affinity with his writing – his introspective prose echoed and inspired the conceptualization of *Estrangement* during a particularly resonant time in the author's life, making the creation of *Estrangement* not just an artistic endeavor, but a personal act of reflection. Within the installation, this convergence of personal resonance, literary depth, and immersive technology invites participants to navigate their own perceptions of secrecy, identity, and connection in a fragmented, dreamlike space.

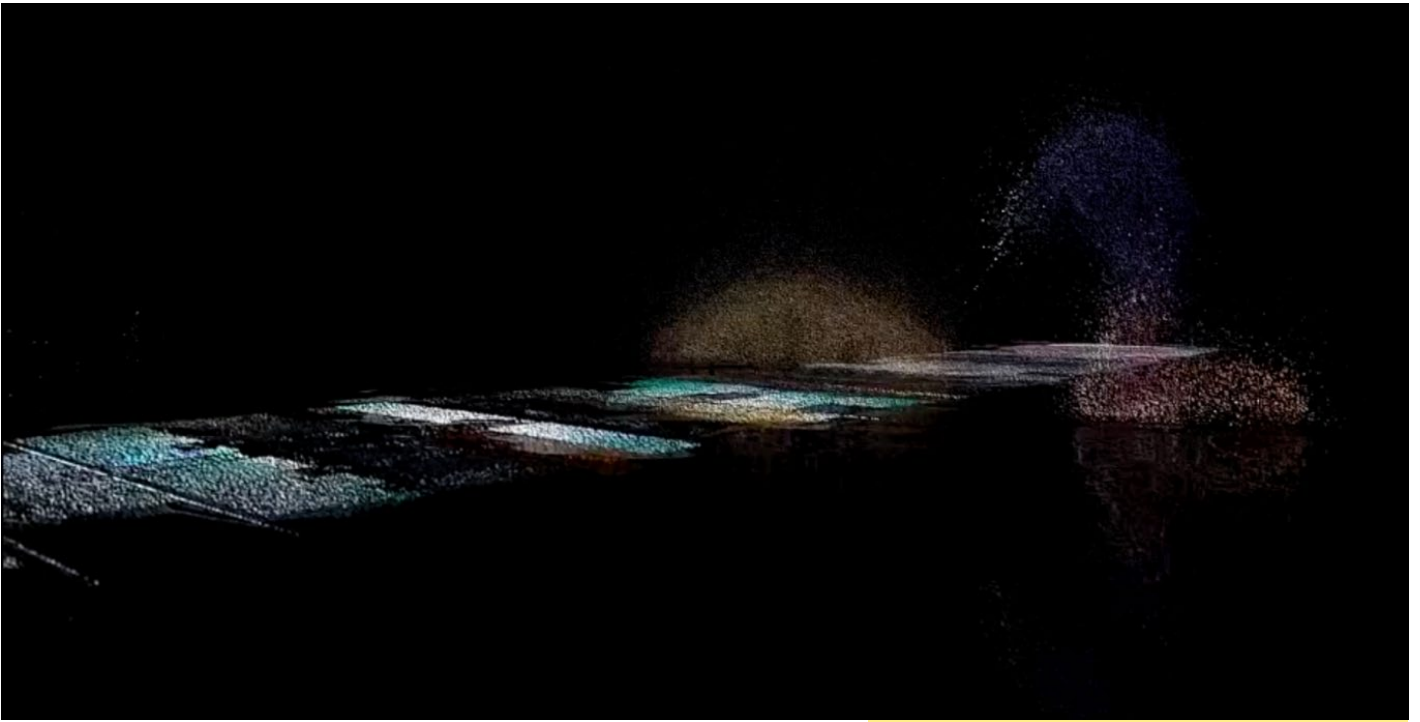


Fig. 5. The theatre scene begins to disintegrate.

Sound Design

The sound design of *Estrangement* creates an auditory counterpart to the visual experience. The dynamic soundscape responds to the user's position and movement, enhancing immersion. Each Kafka parable is accompanied by a unique soundtrack composed using granular synthesis and spectral freezing. Granular synthesis fragments sound into grains, enabling extreme time-stretching and the indefinite "freezing" of sound, producing an ethereal, suspended atmosphere. By layering these grains – what Hoenig refers to as *grain clouds* – new textures emerge, in which multiple fragments of speech or sound can be perceived simultaneously (Hoenig 2002).

This method mirrors the point cloud aesthetic in both form and perception: discrete elements combine into a coherent but unstable whole. For each parable, three distinct audio tracks were created, varying in recognizability and abstraction. As participants approach the point-cloud sculptures, they activate and shape the audio layers, encountering different levels of intelligibility and sonic distortion. This evolving soundscape reinforces the themes of ambiguity and estrangement, echoing Kafka's emotional and narrative complexity.

The stories are voiced by two German actors – one read as male, the other as female – in both German and English. While this introduces a binary vocal perspective, it also opens space for reflection on identity, voice, and representation – questions the project aims to explore further in future iterations.

Technical Development

The 3D scan was created using a FARO FocusS scanner. 15 scans were conducted across audience and stage areas, each capturing over 170 million points. These were aligned and merged using FARO Scene, then exported in the neutral E57 format. The scans were processed in CloudCompare, where extraneous data outside the theatre space was removed. Further refinements, such as eliminating unwanted stage props, were performed using the Virtual Broom plugin (Ulrich 2023).

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To ensure performance compatibility with the VR environment, the point cloud was reduced to 25 million points – less than 10% of the original dataset – via CloudCompare's subsampling feature and exported in ply format. The final installation was developed in Unity 2021.3.21f1, using the High-Definition Render Pipeline (HDRP) for advanced visual fidelity. Unity's Visual Effect Graph enabled dynamic control of point cloud particles, enhancing the immersive, dreamlike atmosphere (Ulrich 2023).

Presentation

The original installation *Oneironautica* has been presented at several events. *Oneironautica II* was shown at *Theater an der Ruhr* over two seasons in 2024, as well as at tanzhaus nrw in Düsseldorf and the NEXT LEVEL Festival for Games in Dortmund, Germany, both in 2024. The current piece, *Estrangement*, premiered in February 2025 at *Theater an der Ruhr* for the opening of the "Secret II" season. Building on the evolving themes and formats of the series, a fourth version of *Oneironautica* is currently in development.

Conclusion

Oneironautica III: Estrangement reimagines theatrical conventions through immersive technology, translating core elements of theatre – staging, temporality, presence, and voice – into a virtual environment. Though the medium shifts, the work retains a dramaturgical arc, symbolic space, and audience-performer dynamics, positioning VR as a powerful extension of theatrical form.

By dissolving the spatial and temporal limits of the traditional auditorium, the piece invites the audience into a hybrid role – both observer and participant – echoing strategies found in immersive and post-dramatic theatre. The use of point cloud scans of an actual theatre doesn't merely reference a stage; it transforms it into an ephemeral, responsive site of interaction. Narrative unfolds not through linear plot or visible performers, but through spatial navigation, vocal presence, and symbolic *mise-en-scène*. In doing so, the work critiques and expands theatre's conventional infrastructures of presence, embodiment, and spectatorship.

As the series continues to evolve, it opens new pathways for interactive performance and immersive dramaturgy.

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