

Thresholds: Stories of Our Inner Selves

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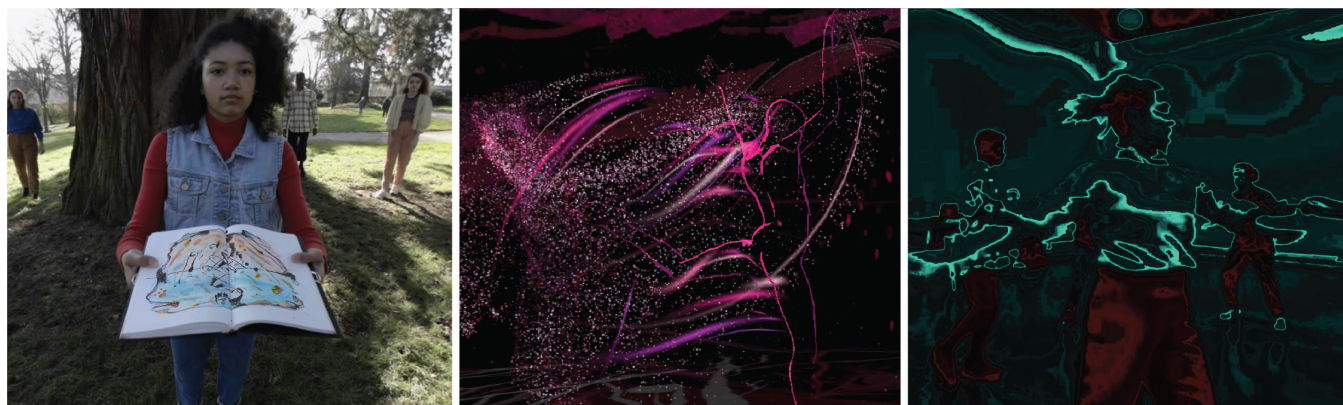


Figure 1: The live performance unfolds across multiple realities. It progresses from 360° video (left) and motion-captured dance (center) before ending with sound-responsive passthrough visuals of the real world (right).

Abstract

The bodies of the spectators who become participants in a live contemporary dance and extended reality performance are perceived as access thresholds to virtual experiences. They are immersed in multisensory narratives with both real and virtual actors, while experiencing their stories and dancing with them.

Keywords

virtual reality, immersive performance, touch, dance, 360 video

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1 Introduction

Thresholds: stories of our inner selves is a new step in research expanding upon the XR performance *Eve 3.0* [Meneghini et al. 2024]. It tells a series of parallel stories about characters affected by mental health challenges, told through the voice and movements of those characters. A selection of audience members wear VR devices in

the performance space in front of the rest of the audience. Through their movements and relationships, at distance and in contact, each participant contributes to a collective choreography. A performer traces the thread of the danced stories on stage, accompanying the audience's participation and tying them together. The performer engages with the participants, facilitating moments of touch seen in the headset and encouraging them to move and dance. The immersive media and choreography evolve from a 360 video that guides participants through specific movements, to interactive visuals that hand over creative agency to the participants. Finally, they dance freely as they see each other and the audience in front of them through music-activated passthrough visuals.



Figure 2: The body as a threshold is grounded in touch facilitated by a performer, encouraging participants to be immersed and follow movements seen in the headset.

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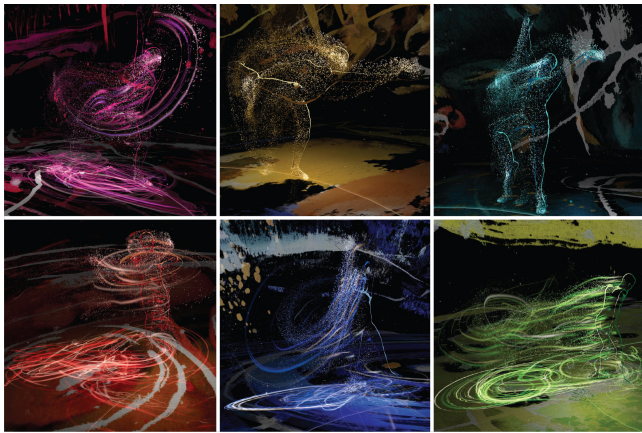


Figure 3: The six characters seen during the real-time motion capture segment in Part 2. Each is represented by a different colour and dances a choreography that represents their inner selves through an environment made of watercolours.

In contrast to *Eve 3.0* where a central character accompanies the performance, in this evolution the participants find themselves at the center of these intimate stories. The performance focuses on the kinesthetic experience of the audience, while reflecting on common mental health challenges including addiction, anxiety, depression, obsession, jealousy and paranoia. Through the movements of the body, the stories question the recurring causes of these states of consciousness. *Thresholds* underlines how the engagement of the body can encourage dialogue and healing.

2 A Live and Digital Immersive Performance

Thresholds begins with a solo dancer invites spectators in the audience to participate. The dancer places them and helps them put on their headsets. Facilitating touch and movement, the dancer guides each participant to explore their own movement. Participants are encouraged to stand up, move, and ultimately participate in a shared and unified dance. For the rest of the audience, participants become part of the performance. Projections relay what the participants see in VR to the audience and enhance visual impact.

Part 1: Discovering a diary. The VR experience begins with a live-action VR video. The stereoscopic video includes moments of physical interaction with characters in the film that coincide with the dancer’s physical interactions. The participants each find a diary and are transported into it as the story unfolds.

Part 2: The internalized experience. The second part, shown in Figure 3, is a 6-degree of freedom real-time CG experience where each spectator can dance with a silhouette of light representing the character’s soul expressing their internalized struggles through their diary.

Part 3: Freely dancing together. The ending allows the spectators to see each other and their surroundings brought to life through music in the virtual space where they can dance and move together. Each ending is unique, culminating in the improvisational movements of the participants as seen in Figure 4.



Figure 4: Ending of a performance of *Eve 3.0* at Laval Virtual 2023. Twelve participants dance together, six in headsets, seeing the real world through music-activated passthrough visuals. Photo © 2023 Prisma Laval Recto VRso.

2.1 Performer Facilitated Embodiment

Participants’ embodiment in the immersive experience is facilitated through physical interaction with the performer. This technique of synchronizing touch to the music was first used in *Eve: dance is an unplaceable place* [Bergamo Meneghini 2019]. Synchronizing these multisensory interactions with the visuals encourages participants to feel present and embodied in the immersive experience [Desnoyers-Stewart et al. 2024].

2.2 Reality Capture and Synthesis Technologies

A combination of a 180° stereoscopic camera with a 180° ‘ambient’ rear camera allowed us to capture the depth of the characters and focus attention. We used Perception Neuron motion capture to record and clean up 8-minute dance sequences. Those motion captured sequences were used to generate particle effect bodies using Unity’s VFX Graph. We used the Meta Quest 2 hand tracking for seamless interaction and the passthrough cameras to immerse participants in another view of reality. Finally, Open Sound Control is used to synchronize the VR headsets, soundtrack, and projections.

Acknowledgments

Choreography: Margherita Bergamo Meneghini. **Scriptwriter:** Veronica Boniotti. **VR Interaction:** Daniel González-Franco. **Real-time VR Design:** John Desnoyers-Stewart. **Music:** Dale Nichols. **Visual Design:** Kirstin Huber & Amira-Sade Moodie. **Creative Producer:** Mark Lee. Thanks to the whole production team. *Thresholds* is produced by Compagnie Voix, with the support of Seesaw Project and Digital Rise. The SIGGRAPH 2025 performance is presented with the support of Alliance Française Vancouver. See compagnievoix.com for full credits.

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