

1 **Temporal Shadows: An Exploration of Ephemeral Narratives through Real-Time**
2 **Motion Tracking and Interactive Projection**
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27 Fig. 1. User Interacting with *Temporal Shadows*
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30 "Temporal Shadows" is a projection-based interactive installation designed to immerse audiences in the dynamic interplay of shadows,
31 time, and personal narrative. By utilizing Kinect for motion tracking, the installation captures the audience's position and silhouette,
32 translating their movements into ephemeral shadows on the temporal canvas. Participants are invited into an engagement with their
33 own temporal essence as they witness the ever-shifting interplay of shadows, serving as a metaphor for the passage of time.
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35 Employing OpenFrameworks for graphics processing and a ceiling-mounted projector for visual projection, the project offers
36 a unique experience where participants actively shape the unfolding narrative through their presence and movement. Through
37 the integration of motion-tracking sensors and engagement with projection-based displays, "Temporal Shadows" delves into topics
38 including the philosophical implications of temporality and the pivotal role of audience interaction in shaping narrative experiences,
39 exploring relationships among the body, data capture, feedback, and usability.
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41 CCS Concepts: • Applied computing → Media arts; • Computing methodologies → Motion capture.
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43 *All authors contributed equally to this research.
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54 Experience

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64 **1 INTRODUCTION**

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66 The profound intertwining of human existence with temporal dynamics has been a subject of philosophical contemplation
67 throughout history. As Merleau-Ponty suggests, our very "staying in place" is inherently temporal, highlighting
68 the transient nature of each bodily stance [1]. Grounded in this philosophical exploration, "Temporal Shadows" seeks
69 to innovate within the realm of interactive installations by merging the concepts of human bodies, temporality, and
70 time through the prism of technology. It aspires to challenge preconceived notions by creating a digital canvas where
71 the transient nature of human existence is visually manifested, allowing individuals to engage in an aesthetic encounter
72 that goes beyond the subject-object dichotomy.

73

74 Moreover, Kühnapfel et al. introduce the concept of "triggers" as catalysts for attention redirection towards the self,
75 fostering moments of reflection [2]. Our project, influenced by this notion, incorporates elements that may trigger
76 specific responses, such as the sense of body movements being observed and being projected. These triggers are designed
77 to shift participants' attention inward, inducing moments of self-reflection amidst the dynamic interplay of shadows
78 and time.

79

80 In the synthesis of philosophy and technology, our project represents a pioneering endeavor. Incorporating techniques
81 like motion capturing and computer vision using Kinect and OpenFrameworks, we employ a technical framework
82 to capture the nuanced interplay between the human body, temporality, and time. By translating Merleau-Ponty's
83 philosophical insights into a tangible, interactive experience, our installation not only reflects the transitory nature of
84 human presence but also actively involves participants in shaping the temporal narrative. Through the creative use of
85 technology, we aim to demonstrate that the beauty of art, in this context, lies in its ability to fuse philosophical concepts
86 with experiential aesthetics, challenging conventional boundaries and fostering a deeper understanding of the temporal
87 dimensions inherent in our very existence.

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89 **2 SYSTEM DESIGN & IMPLEMENTATION**

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91 We developed the system using Microsoft Kinect for Xbox One, a motion sensing input device, OpenFrameworks [5],
92 an open source C++ toolkit for creative coding, along with its Computer Vision libraries including ofxOpenCv [4], and
93 ofxCv [3], as depicted in Figure 2. The physical setup in Figure 3 features two Kinetics, one overhead to capture body
94 position and another angled to capture silhouettes, along with a projector mounted on the ceiling.

95

96 By filtering and processing the real-time data using depth thresholds, the program created in OpenFrameworks
97 retained only the essential information for capturing the user's position and silhouette. Subsequently, the program
98 stored the drawn representations as buffered textures based on the processed data as shown in Figure 2. In the final
99 stage, these textures were seamlessly rendered on the same canvas as a clock and were passed to the projector.

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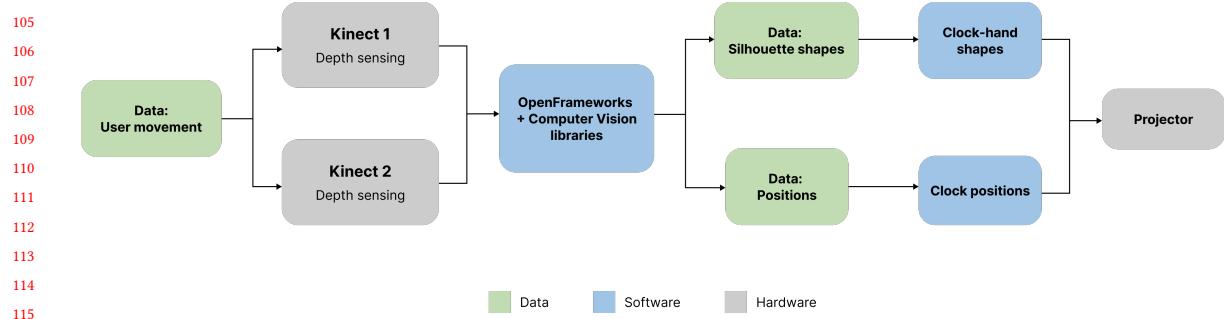


Fig. 2. System Diagram

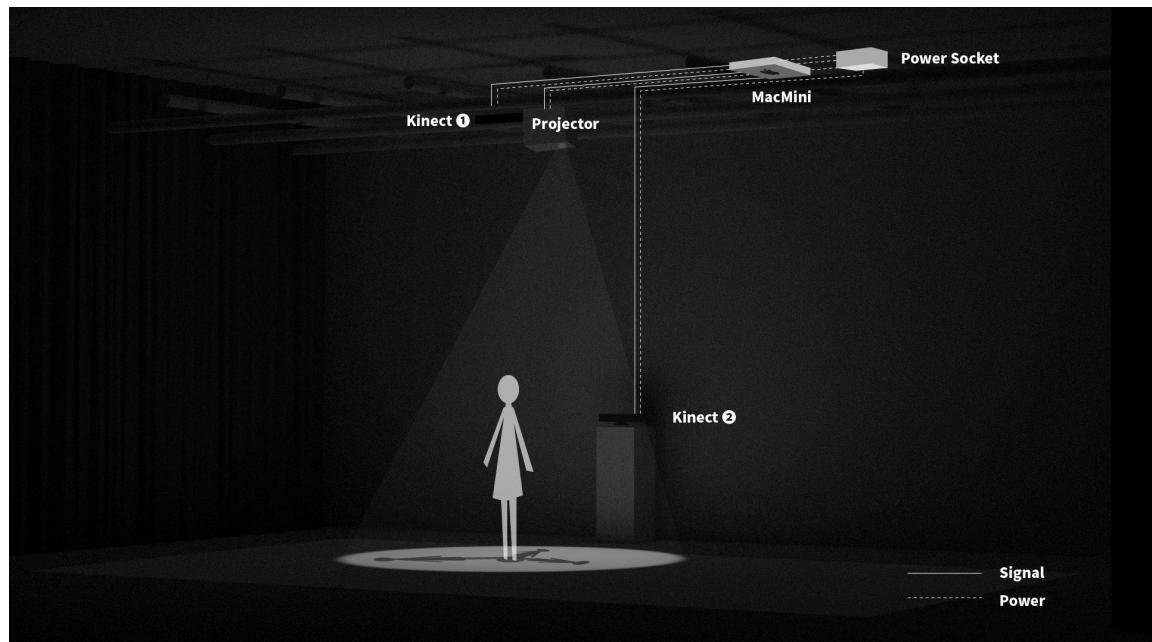


Fig. 3. Physical Setup

3 SUMMARY & FUTURE WORK

In our exploration of the intersection between philosophy and technology, "Temporal Shadows" has illuminated the transient nature of human existence through innovative interactive installations. Grounded in the philosophical insights of Merleau-Ponty and inspired by Kühnapfel et al.'s concept of triggers, our project dynamically merges the concepts of human bodies, temporality, and time. By leveraging motion capturing and computer vision technologies, we have created an experiential canvas where participants engage in a visually manifested exploration of the temporal dimensions inherent in their very being.

Looking ahead, "Temporal Shadows" holds potential for further development and refinement. Future iterations of the project could explore avenues for deeper individual and collective engagement. Introducing choice points and

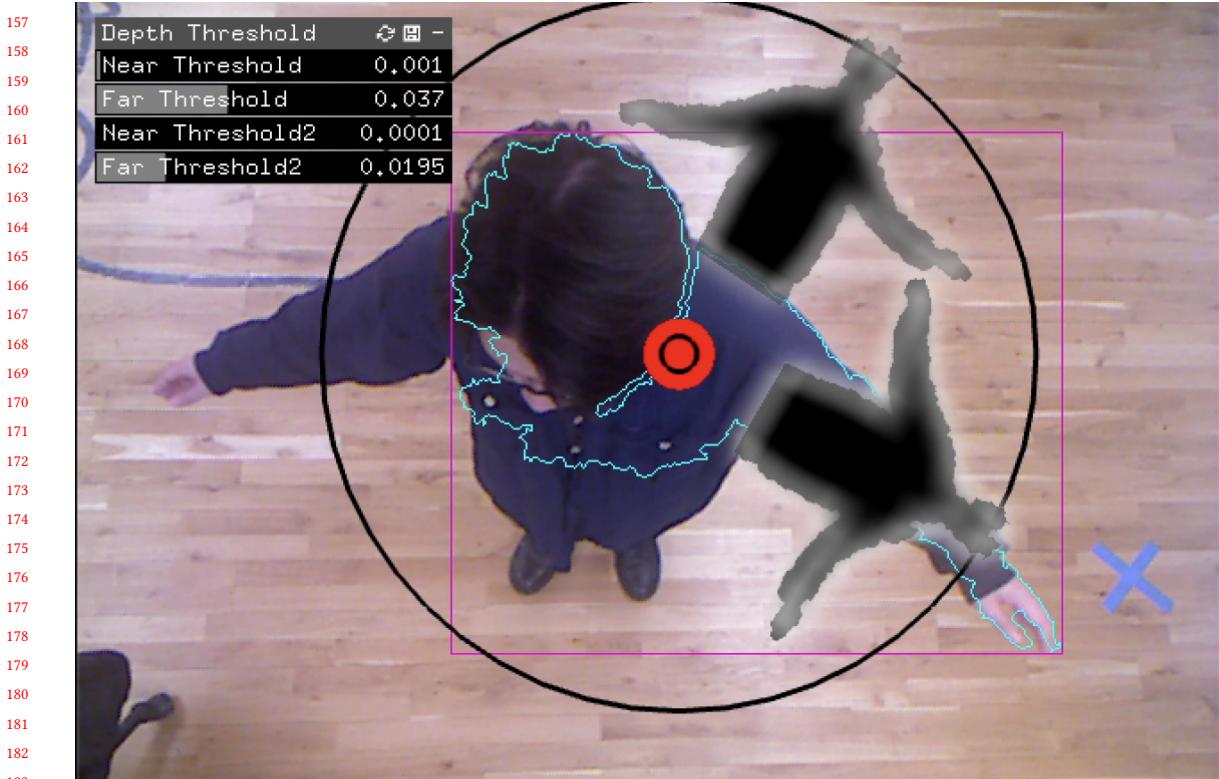


Fig. 4. Position Detection & Mapping in OpenFrameworks

subtle hidden elements progressively revealed over time to the narrative could empower participants to shape their experience, fostering personal connections and individual reflection, also could encourage repeated exploration and deeper engagement, inviting participants to unravel the artwork's meaning over time. Additionally, collaborative shadows could allow for multiple participants to interact simultaneously, creating interconnected narratives that reflect the concept of shared temporality.

By implementing these enhancements, "Temporal Shadows" has the potential to evolve into a multi-faceted experience that resonates on both personal and collective levels, leaving a lasting impression on its audience. Through continued innovation and exploration, our project aims to foster a deeper understanding of the temporal dimensions inherent in human existence.

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