Memento (Oma)mori: Representing Memory, Grief, and Loss in a Cinematic Virtual Reality Project

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Abstract

In this paper, we present our autobiographical Cinematic Virtual Reality (CVR) project *Memento (Oma)mori* – an interactive story about memory, grief, and loss. This project was inspired by our technological engagement with temporal perspectives and the phenomenology of grief – represented via a collection of seemingly unrelated memory objects, the use of filters to evoke impressionistic visuals, and composition of film score using an avant-garde interactive music game (*Electroplankton*). Viewers are provided with a virtual flashlight which temporarily removes the impressionistic filter on illuminated objects. The final result is a participatory memory-making experience in which the viewer can choose which objects to bring into clarity and reflect on their own experiences with memory, grief, and loss.

Keywords

Cinematic Virtual Reality, Practice-Based Research, Grief and Loss, Memory, Impressionistic VR, Immersive Storytelling

Introduction

In this paper, we present our VR film *Memento (Oma)mori* – an immersive VR story about memory, grief, and loss. Inspired by works that explore the reflexive dimensions of cinematic virtual reality (CVR) storytelling [2], the experience invites the audience into an imagined world where memories drift, face, and collide. Stepping into a dreamlike landscape filled with seemingly unrelated personal objects – each one representing a memory or story – the viewer remains stationary but is free to visually explore the space in 360-degrees. Using stroke scale, stroke randomness, blending noise, and other filters, we created an impressionistic visual effect, intentionally blurring the details of the memory objects. The viewer has the option to pick up and use a flashlight (a talisman) which removes these visual effects when shone on any of the objects, temporarily rendering their details visual. The VR film also presents a 12-part narrative that is randomized with each viewing, further exploring the effects of temporality in the context of memory, grief, and loss. The accompanying soundtrack was composed using the experimental audio game *Electroplankton* [20]. The work is theoretically inspired by Shardlow's work on the temporal perspectives and phenomenology of grief [25].

Related Work

Cinematic VR has increasingly been employed as a medium to investigate complex emotional experiences, exploring themes of loneliness [2], cognitive decline [15], grief [26], and death [10]. For example, Bahng et al. present *Anonymous,* an interactive CVR experience about death and loneliness among the elderly population in South Korea [2]. They note that while VR has been positioned as an "empathy machine" [19], its deeply immersive and interactive qualities can also invite users to slip into the narrative too easily – accepting its framing without critical reflection or identifying with its perspective in an overly passive way. To this end, they mobilized distancing effects from art, which in traditional artforms calls attention to the constructed nature of the experience, which invites active empathy and reflection. To this end, they created a virtual story world with minimal and abstract aesthetics, restricted control, and explored multiple points of view to explore how these design choices can promote reflection in CVR storytelling [2].

Strong [26] developed original grief narratives – filmed stories of real families sharing their stories of grief and loss after the sudden passing of a member of their immediate family. In her study, she compared 360-degree versions to traditional, fixed-frame film formats to see whether or not immersive videos elicited stronger empathetic responses. Although she found no statistically significant difference in affective or cognitive empathy, she did note a heightened sense of presence among participants, suggesting that the relationship between empathy and immersive formats may necessitate new approaches to measuring these types of empathy.

Other creative examples include *The Descent* by Tatiana [27], which immerses the viewer in a series of esoteric scenes paired with complex, layered musical accompaniment and featuring interview excerpts from participants describing their personal experiences with grief and loss. *Traces: The Grief Processor* [28] is a collaborative VR experience that creates interactive, visual representations of grief that participants can physically manipulate them using the force of their gestures. Samantha Kingston's *Anonymous* is a 360-degree film representing an open letter to her mother, an alcoholic, who passed away from liver disease [14]. Finally, the South Korean documentary *Meeting You* [12], while not a VR project, it is

centered around the story of Jang Ji-sung, whose daughter Nayeon died at the age of 7 from cancer in 2016. Six studios worked in collaboration to create a virtual version of Nayeon who Jang Ji-sung could see and interact with her daughter one more time. The documentary features the moment when Jang was able to interact with virtual Nayeon – her pain and grief in these scenes is raw and overwhelmingly powerful. Collectively, these projects demonstrate how immersive media have been used to materialize and mediate experiences of grief.

Gruenewald and Chen [11] argue that VR can serve as a "memory machine" noting that "[n]arrating and sharing individual and collective traumatic memories have featured prominently in narrative VR." They contend that three core affordances of VR uniquely enable audiences to experience the memories of others in CVR: embodiment, immersion, and interactivity. Embodiment describes the viewer's ability to step into someone else's vantage point – either the person recalling the memory or the person being remembered – so that the experience unfolds from within another's perspective. Immersion builds on this by surrounding the viewer with the sensory and atmospheric details of the remembered setting, allowing them to feel present inside that memory-space. Finally, interactivity introduces a degree of agency: even small actions, like choosing where to look or how to move through the scene, shape how the viewer encounters and interprets the memory in VR.

If cinematic VR can be understood as a kind of "memory machine," then it raises the question of how the medium might be mobilized to evoke, reconfigure, or critically engage memories shaped by grief and loss. In psychology, grief is often described as a multifaceted emotional, cognitive, and physiological process through which individuals adapt to the loss of someone or something significant. Shardlow distinguishes between three temporal perspectives that human experiences occupy when experiencing grief: the perceptual, the agential, and the narrative [25]. Shardlow asserts that grief disrupts the temporal flow of our personal narratives, creating a rupture between the life-story we once projected forward and the present we now inhabit.

Human identity is widely understood to be constructed through narrative forms [17, 23]. Therapeutic practices have long drawn on storytelling – particularly retrospective narration – as a means of imbuing past events with coherence and meaning [3, 5]. Research has further demonstrated that interactive digital authoring tools can facilitate the production of autobiographical, digital representations of lived experience [4], including those created within VR environments [8]. However, as Bahng et al. note, realizing the full expressive potential of VR requires collaborative design processes, particularly when working with participants who lack prior experience designing for immersive media. Such collaboration is essential to ensuring that creators can effectively engage VR's unique narrative affordances, including perspective, interactivity, and effective design of spatial environments [1, 3].

Looking to the unique narrative affordances of CVR, we were motivated to explore the ways in which aesthetics, interactivity, and narrative design could be mobilized to explore themes of memory, grief, and loss. In the following sections, we present the design of our CVR film *Memento (Oma)mori.*

Memento (Oma)mori

In this section, we provide an overview of the design and development of our autobiographical VR film *Memento (Oma)mori.* The project's title represents an intermingling of two conflicting themes. The Latin phrase "memento mori" is commonly translated to "remember you must die" and serves as a reminder of the inevitability of death. It is commonly invoked in art and philosophy to encourage us to reflect on our mortality and live more meaningful lives. *Omamori* are Japanese amulets or talismans that are said to provide various forms of luck and protection. Here, when the user stands in the virtual environment – constructed from an assemblage of seemingly random 3D objects representing memories from a past life – an impressionistic filter makes it difficult to see the details of these memory objects. By using the flashlight as a memory talisman, they are able to restore visual details to these artifacts temporarily.

This mechanic evokes the aesthetics and philosophy of the 19th century impressionistic art movement which prioritized techniques that captured moments as experienced, capturing the essence of the subject, rather than its details. The work of Monet – a pioneer of the movement – whose work represented "the immediate impact of the landscape on the eye by focusing on the transformations of light and color" rather than on the details of the scene [24]. Just as our memories tend to fragment, blur, and emphasize affective resonance rather than factual detail, impressionism renders scenes through loose brushwork, shifting light, and selective focus. We were motivated to explore how shaders in Unity could be harnessed to represent this effect in a dynamic way.

Figure 1. Screenshot from *Memento (Oma)mori*

We were further motivated to examine how digital media shape the curation and reconstruction of memory, even when using what are considered "traditional" capture

techniques. Photographs and videos – even 360-degree formats – offer only partial inscriptions of an experience: they fix a moment from a single vantage and flatten complex spatial, sensory, and affective dynamics into a limited record. These captures can be useful, but their representational narrowness becomes especially apparent when we attempt to recreate a place or a moment with any semblance of volumetric authenticity. Unless extensive visual data were collected at the time, the resulting reconstruction inevitably relies on inference, interpretation, and imaginative supplementation. Thus, when we try to volumetrically rebuild memory, we must fill in the gaps ourselves – and in doing so, we are left to question whether we are honouring the memory or merely honouring our best guess at its accuracy.

This tension between memory, reconstruction, and imaginative filling-in is not unique to contemporary digital media; it is part of a much longer lineage of mediated remembrance. This is perhaps best explored in prior research investigating the relationship between postcards and memory. As Lydecker observes, postcards historically operated in a similar register: they functioned as memory artefacts for those who had travelled and as imaginative surrogates for those who had not [16]. In this way, postcards "embodied memory" for visitors while simultaneously creating "memory through the imagination" for recipients who might never have encountered the depicted place firsthand. They were reminders of "distant places and things seen," even when their images were stylized, idealized, or otherwise detached from the realities they purported to represent.

To this end, the scene depicted in *Memento (Oma)mori* is populated with objects that act as memory artifacts: simulacra that gesture toward their originals while lacking full visual fidelity. In doing so, the world foregrounds the instability of memory, reminding viewers that recall is never a perfect reproduction, but an assemblage of memory built from approximations, fragments, and distortions.

Implementation

The project was developed in Unity for deployment on the *Meta Quest 3* Virtual Reality head-mounted display (HMD). To achieve the desired impressionistic visual style, we implemented a custom shader designed to give 3D objects a hand-painted appearance. Using Unity's Universal Render Pipeline (URP) Shader Graph, we modified inputs for the base color, normal map, and metalness/smoothness parameters. For the base color, the applied texture was sampled using Level of Detail (LOD) to introduce controlled blurring and reduce visual precision. A Lerp operation was then used to introduce subtle colour variations, which were combined with outputs from the normals subgraph to produce the final stylized effect.

For the normals, we began by taking the input normal map and introducing several editor-adjustable parameters, including stroke randomness, stroke scale, blending noise, blending noise scale, and blending noise strength. Simple noise was first generated and scaled using the blending noise parameter to establish the foundational colour strokes; however, this initially produced patch-like artifacts rather than the appearance of brushwork. To address this, we multiplied the noise by the blending noise strength, which enhanced directional variation and yielded a more convincing brush-stroke effect. Stroke randomness was then incorporated to reduce uniformity and contribute to a more painterly aesthetic. A sine-wave function was applied to animate the strokes over time, further reinforcing the impressionistic quality of the scene. We then sampled the metalness map and integrated it into the shader via a multiply operation, completing the material's overall stylization.

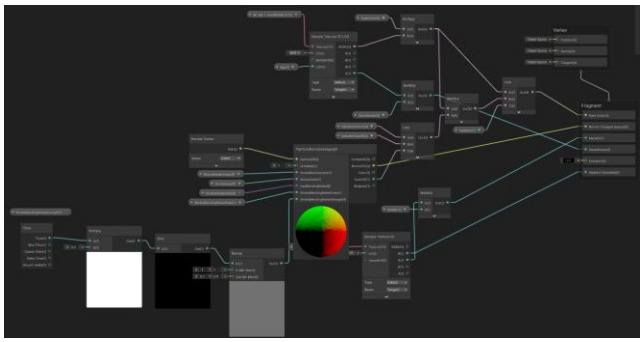

Figure 2. Design of the visual effect for *Memento (Oma)mori* in Unity.

With the painterly shader complete and applicable to any material in the scene, we next implemented the "flashlight mechanic." To simulate the beam, we created an invisible cylinder parented to the flashlight, allowing its position and orientation to follow the user's movements. A mask shader was applied to the cylinder, making any object inside its volume invisible; this effect was restricted to objects tagged as "painted." Each interactable object was therefore represented by two versions: a larger mesh using the painterly shader and a slightly scaled-down duplicate using the standard material. As the mask intersects the painterly mesh, the underlying un-styled version is revealed, producing the illusion that the flashlight beam is stripping away the painted effect.

Lastly, we integrated the virtual reality rig and interaction system, enabling users to pick up and manipulate the flashlight and freely navigate the environment. We also applied several post-processing effects—including chromatic aberration, film grain, depth of field, motion blur, lens distortion, and bloom—to enhance the scene's impressionistic, dream-like visual character.

Audio Design and Music

Electroplankton, [20] created by Toshio Iwai and released by Nintendo for the Nintendo DS in 2005, occupies a distinctive space at the intersection of interactive music systems and experimental game design. The title offers players ten audio visual instruments – each embodied as one of ten species of "plankton" that respond to touch and

gesture to generate dynamic musical compositions. For example, *Luminaria,* shown in the figure below, follows a path of arrows set by the player, creating different melodies. Interestingly, Iwai's *Composition on the Table* [13] was the blueprint for the *Luminaria* plankton [22]. At the time of its release, *Electroplankton* was widely regarded as avant-garde and was framed less as a conventional game than as an interactive audio simulation [21].

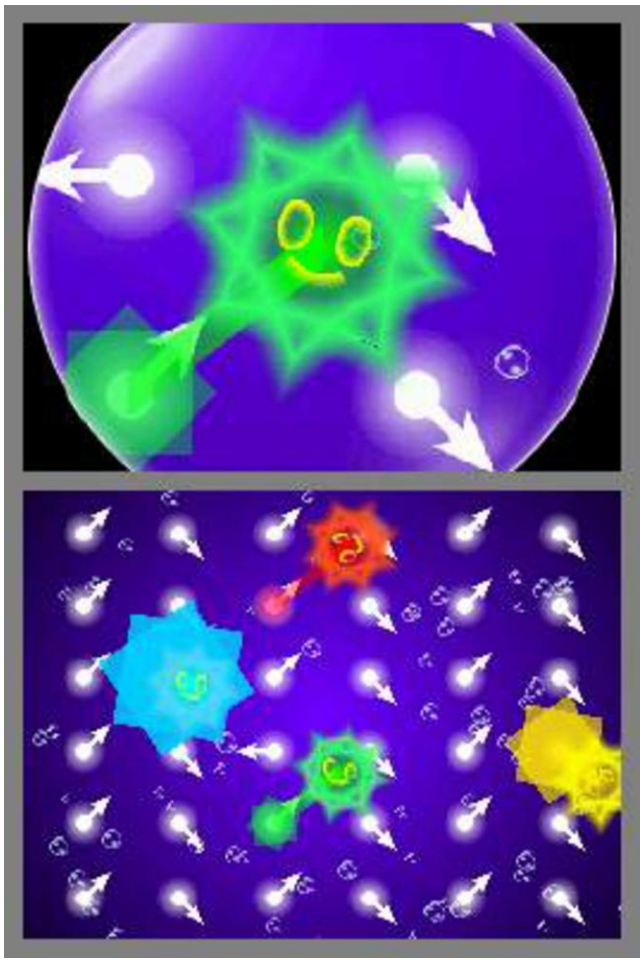

Figure 3. *Electroplankton* (Nintendo, 2005)

Electroplankton was selected as the compositional platform for the project's soundtrack as its experimental design offers a uniquely exploratory space for crafting audio for immersive media. The game's ambient and atmospheric qualities resonate with the some of the tonal characteristics often associated with impressionistic music. Musical impressionism emerged in the late 19th century and is often associated with Claude Debussy [6]. Impressionism in music focuses on mood and atmosphere rather than a detailed tone-picture or melody. The style invokes the use of ambiguous tonality, extended harmonies, use of modes and exotic scales, parallel motion, and extra-musicality [29].

For this project, we composed twelve one-minute musical pieces using of the ten available plankton: *Tracy, Hanenbrow, Luminaria, Sun-Animalcule, Nanocarp, Lumiloop*, and *Marine-Snow*. We connected a 3DS to a computer using a 3.5mm audio cable with a splitter so we could hear the output with headphones while simultaneously recording compositions into *Audacity*. Each composition is paired with one of the script's twelve narrated stanzas, creating a modular structure in which sound and story unfold in parallel.

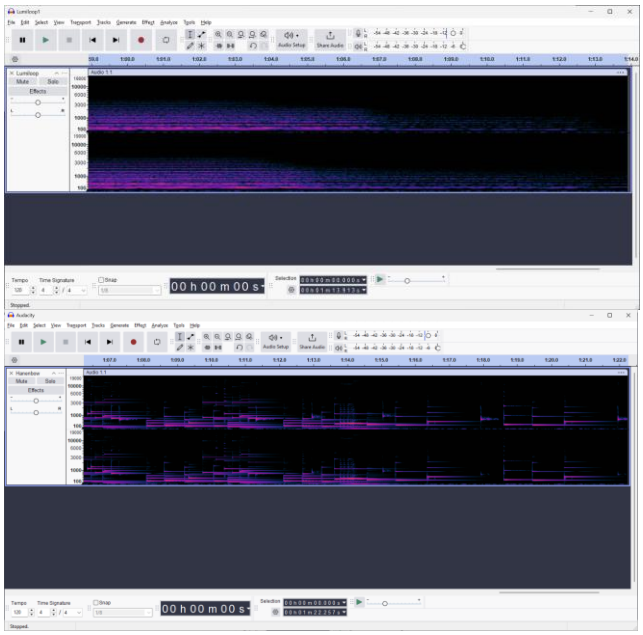

Figure 4. Sample audio track composed with *Lumiloop* (top) *Hanenbrow* (bottom) and in Audacity.

Non-Linear Narrative Design

As the project investigates the temporal perspectives and the phenomenology of grief, we were motivated to explore how narrative design and controlled randomness could extend this thematic focus. The early version of the script arranged events non-chronologically, reflecting the fragmentary nature of memory. However, we became concerned that presenting the stanzas in a fixed progression might inadvertently imply chronological relationships between them that were never intended. Social scientists have long emphasized that our sense of self and agency is structured narratively [17, 23]. Shardlow argues that narrative functions as a dominant modality through which we organize temporal experience, yet our "present knowledge and emotions often infect what is being recalled" [25]. He further observes that the deterioration of a relationship can retroactively reframe once-joyful memories as sad or even embittered. In this view, narrative awareness is less a forensic account of the past than a selective, situational reconstruction shaped by our knowledge of the present. As such, we revised the delivery of the script so that the memories described by the narrator would be presented in a randomized order, resulting in a unique narrative experience with each viewing. Extending this logic further, we sought to explore how this randomization might influence how viewers make sense of the stanzas that follow.

The script is structured around twelve stanzas (see Table 1) each accompanied by twelve original audio tracks composed with *Electroplankton*. While the first two stanzas are always played at the start of the film and the final two are always played at the end, the eight stanzas in the middle – each reflecting on a distinct life event tied to loss and memory – are presented in a randomized order. Although inspired by different people and moments in the writer's life, these stanzas are addressed to a singular "you," leaving that figure's identity intentionally open to interpretation. The accompanying *Electroplankton* compositions are also randomized, such that each stanza is paired with a different audio track on every viewing. This resulted in an investigation into how non-diegetic audio contributes to emotional tone and impacts how audiences come to interpret the story.

Stanza	Narrative Themes
1	Introduces space and talisman
2	Introduces memory theme
3	Bravery and memory curation; time spent with a child
4	Space and grieving in advance
5	Loss and grief
6	Meaning in small moments
7	Fragile recollection
8	Continuing self-discovery
9	Parenthood and presence
10	Parent-child relationships, identity
11	Memory and mortality
12	Memory and the passage of time

Table 1. Narrative themes by stanza in *Memento (Oma)mori*

Metz describes film as "[b]orn of the fusion of several pre-existing forms of expression, which retain some of their own laws (image, speech, music, and noise)" [18]. Research has shown that non-diegetic music plays a crucial role in establishing the emotional tone in film, helping to expose the inner feelings of the main characters, and helping the audience make meaning of the film [9]. The congruence association model (CAM) provides a framework for understanding the ways in which audiences interpret and internalize the meaning of a film [7]. The model posits that audiences make meaning by associating audio cues with visual or narrative elements when there is perceived congruence between them. Incongruence can result in confusion, irony, or detachment, but can also be used deliberately for effect. While we were initially motivated to create a linear story with accompanying soundtrack, we were inspired to leverage the procedural narrative affordances of CVR to explore the relationship between our non-diegetic audio compositions and a randomized, non-linear narrative.

Each of the twelve audio tracks composed with *Electroplankton* shares an ambient, impressionistic quality, yet they differ subtly in tempo and melodic pace or urgency. These nuanced variations can influence how the accompanying random narration is perceived. For instance, a slower, gentler melody versus a busier, more chaotic one could shift the audience's interpretation of a stanza reflecting on the passage of time. In this way, the interplay between audio and narration introduces an additional layer of meaning, where each listening experience is shaped by procedural pairings of musical and narrative elements. This design choice was meant to replicate the instability, nonlinearity, and ongoing reconfiguration that often characterize experiences of grief.

Discussion and Conclusions

In this paper, we presented *Memento (Oma)mori*, a cinematic VR project that investigates temporal perspectives and the phenomenology of memory, grief, and loss. While CVR offers the capacity to construct highly interactive, visually detailed environments, our design approach was informed by Bahng et al.'s use of distancing effects in *Anonymous* [2]. Similarly, although the talisman (flashlight) in our piece facilitates participatory acts of memory-making, its ability to "preserve" the details of each memory artifact is intentionally temporary. This invites the audience to reflect on how our own details in our own memories may be fleeting and unreliable.

The project visualizes autobiographical memory by assembling incongruous objects within a single virtual space and by employing representational facsimiles rather than accurate reproductions of remembered places or items. In doing so, it foregrounds the idea that recall is never a precise reconstruction, but an assemblage of approximations shaped by affect and time.

The visual design of the project was inspired by impressionistic painting which emphasizes capturing the essence of the subject, rather than its details. We further explored impressionism in the composition of twelve original audio tracks using the experimental audio game *Electroplankton*. The game's ambient and atmospheric qualities resonate with some of the tonal characteristics often associated with impressionistic music.

We also leveraged the ability to randomize both our audio narration as well as the selection of accompanying audio tracks. This procedural structure not only produces a distinct narrative progression with each viewing but also opens space for divergent audience interpretations, shaped by the shifting contextual cues that accompany different narrative–audio pairings. The randomized audio tracks explore how non-diegetic audio pairings with narrative in film further impact the meaning audiences infer. The interplay between audio and narration introduces an additional layer of meaning, where each listening experience is shaped by procedural pairings of musical and narrative elements. This design choice was meant to replicate the instability, nonlinearity, and ongoing reconfiguration that often characterize experiences of grief.

Through the integration of impressionistic audio–visual design, non-linear narrative strategies, and randomized audiovisual pairings, *Memento (Oma)mori* explores how grief disrupts temporal continuity and reshapes the ways

memories are constructed, perceived, and remembered. Taken together, these design choices demonstrate how cinematic VR can serve not only as a medium for representing memory, but also as a methodological tool for probing the unstable, recursive, and affectively charged processes through which grief is lived and narrated.

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Maryam Musa is a VR and game developer, artist, and part-time instructor whose work bridges technical development and creative practice. She collaborates with artists and researchers on interdisciplinary projects that explore the expressive possibilities of interactive media, supporting teams in translating conceptual ideas into functional and engaging digital experiences. Musa served as project and art director for the horror game *The Space Between*, which received an Honourable Mention for Accessible Game Design.