

Remembrance: A Bio-feedback Gamified Performance Project

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Abstract

This presentation centers on the Remembrance project, an ongoing endeavor since 2019, which moves beyond conventional medical perspectives on dementia to explore its broader philosophical and relational implications. By integrating machine learning technologies with elements inspired by East Asian shamanic traditions, the project offers an alternative lens to examine the complexities of cognitive decline, highlighting the paradox of the human brain's persistent quest for understanding despite progressive impairment.

Within this context, "Remembrance: Magma" is an immersive 3D animation project that harmonizes machine learning, cutting-edge neuroscience, East Asian aesthetics, and a deeply personal narrative to explore the intricacies of dementia. The work extends beyond the medical understanding of the condition to delve into its philosophical, relational, and poetic dimensions. "Remembrance: Coral" is a bio-feedback gamified performance project building upon the themes explored in "Remembrance: Magma." It delves into the profound emotional landscape of confronting early-onset Alzheimer's, a condition intimately linked to the artist's family history. By merging the technological sophistication of machine learning with EEG sensor data, this project crafts a live narrative steered by brainwave activity, transcending traditional modes of storytelling and erasing boundaries between observer and participant, as well as between the real and virtual worlds.

Keywords

multiverse, digital collaboration, metaverse, time accessibility, deep time perception, collective responsibility, environmental ecology, memory enhancement, time-traveling art, collective memory

Introduction

"Remembrance: Magma" and "Remembrance: Coral" are two innovative projects that offer distinct perspectives on dementia. "Remembrance: Magma" serves as the foundational work, a 3D animation showcased within an immersive video installation. Subsequently, "Remembrance: Coral" emerged as a bio-feedback gamified performance project. Together, these projects transcend conventional medical perspectives on dementia, venturing into profound philosophical and relational dimensions, collectively redefining our understanding of this complex condition.



Figure 1. Remembrance: Coral (2023) - A Still Image from the Live Performance Video ©Copyright Chanee Choi

Project Framework

Aesthetics of the Surrealism The Surrealist movement is a major influence on my work but I felt that of all aesthetic traditions, it would be best suited to representing the confusion of memory in the functioning of the brain, so I drew heavily upon its resources in making *Remembrance: Magma*. One narrative states that Surrealism was first begun by the French poet and writer André Breton.¹ He was the author of *The Surrealist Manifesto* in 1924, and curated the exhibition *Le Surréalisme* in Paris in 1947, including the work of his notorious gang of surrealist friends. He quoted: "Nothing that surrounds me is object, all is subject." Surrealism stretches beyond the common human experience into the gap between rationally accepted activities or aesthetics and the unconscious, unruly energy of dreams. If Realism communicates the socially agreed-upon rules of reality, then Surrealism inverts or subverts these rules, inventing uncanny beauty to fill the space left by the rejection of societal conventions. Perhaps it is surreal that you see the world in one way and I see it in another. If surrealism is in fact a component of subjectivity, then the fantastical thinking of the Surrealist art movement is of a much bigger, much grander nature than this everyday strangeness. Like when dreaming, the Surrealist world can seem quite ordinary at first glance, as if it is operating on the common plane of understanding, but then, as if upon waking up, you realize it is set deeply askew.²

¹ Dempsey, Amy. Surrealism. Thams & Hudson Ltd, p. 6

² Chan, Stephanie Ellen. Meeting surrealism: An obsession with Escher then and now. 2017.
<https://stephanie-chan-pzsm.squarespace.com/blog/2017/4/19/meeting-surrealism-an-obsession-with-escher-then-and-now>

For my work with *Remembrance*, I took particular inspiration from René Magritte and Maurits Cornelis Escher. Magritte's work is known for challenging observers' preconditioned perceptions of reality, while Escher's work features mathematical objects and operations that include impossible objects, explorations of infinity, reflection, symmetry, perspective, truncated and stellated polyhedra, hyperbolic geometry, and tessellations.³ Inspired by these artists, I created a fantastical environment by inverting and twisting spaces and objects, presenting the audience with a bizarre and unsettling experience.

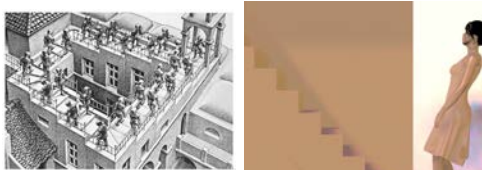


Figure 2: On the left is M.C. Escher, "Relativity" (1953) ©Copyright M.C. Escher. On the right is *Remembrance: Magma* (2022) ©Copyright Chanee Choi

Surrealism and Machine Learning Bretón transcribed the dreams⁴ of his unconscious mind through the automatic writing method that Surrealists called automatism. It is a method not entirely dissimilar to stream-of-conscious writing, but as Bretón said “surrealism is based on the belief in the superior reality of certain forms of previously neglected associations in the omnipotence of dreams, in the disinterested play of thought”⁵ and it is this perspective that makes it distinguishable from other methodologies. In automatic drawing was another method used by the Surrealists to express the subconscious. Drawing in this way one may move randomly or lose control while following coincidences as they arise. Artists who have practiced this style of automatic drawing include Joan Miró, Salvador Dalí, Jean Arp, and Picasso. It is my supposition that artists can now use machine learning for the same purpose. This may seem counterintuitive because when most think of machine learning or artificial intelligence, they think of the control of automation rather than Surrealist unconscious freedoms.⁶

For example, in natural language processing models such as GPT-2 and GPT-3 from OpenAI, when a certain

³ https://en.wikipedia.org/wiki/M._C._Escher

⁴ The automatic writing of Andre Breton, 2021, <https://fahrenheitmagazine.com/arte/arte-letras/la-escritura-automatica-de-andre-breton-una-transcripcion-de-sus-suenos>

⁵ Poetry Foundation, <https://www.poetryfoundation.org/poets/andre-breton#:~:text=Thought%2C%20in%20the%20absence%20of,the%20disinterested%20play%20of%20thought.%E2%80%9D>

⁶ Hebron, Patrick. Rethinking Design Tools in the Age of Machine Learning. <https://medium.com/artists-and-machine-intelligence/rethinking-design-tools-in-the-age-of-machine-learning-369f3f07ab6c>

prompt (topic) is input, the statistical data sets pervasive on the internet related to that topic are used to create new words. I would argue that while automatic drawing and automatism source from the data in the artist's personal unconscious mind, these language processing models function very similarly while drawing from a kind of online collective mind. In other words, it can be said that it is Surrealist because it produces an average answer using these statistics, and the average answer creates a text not bound by any rules and outside the control of the artist. For this project, I created text using GPT-2 and OpenAI's Dall-E, and completed my animation storyboard and composition with images resulting from text prompt input. Another artist who successfully uncovered the potential of Surrealist methodologies hybridized with machine learning technology is Refik Anadol. His work *Machine Hallucinations* is an ongoing exploration of data aesthetics based on collective visual memories of space, nature, and urban environments to transform the processing of data into surreal hypnosis.⁷

Remembrance

Overview Inspired by my family's history of dementia, *Remembrance* revolves around personal experiences that have deeply influenced its conceptual foundation. During my childhood visits to my maternal grandmother's home, I witnessed her severe dementia and the complex emotions my mother harbored towards her, including regret, resentment, and sadness. My mother, who wasn't raised by my grandmother and felt a sense of discrimination among her siblings, struggled to fulfill her caregiving role as my grandmother's health deteriorated. I gradually realized the generational nature of this disease, passed down from mother to daughter, leading me to fear that dementia would inevitably be part of my own future. In 2015, when my mother began exhibiting signs of dementia, she sought a detailed examination at the hospital secretly, reflecting the stigma associated with dementia in Korean society, where the term itself implies foolishness and carries a demeaning connotation. My family enjoyed social and financial success, and my mother feared that her diagnosis would tarnish our family's reputation and prospects. The weight of her diagnosis and its potential impact on me, her only daughter, must have been overwhelming. Had she shared her diagnosis earlier, she could have initiated treatments to slow the disease's progression. By 2017, my mother's dementia had progressed to a point where she could no longer conceal it. I was pursuing my doctoral studies in Seattle, far away from her, and witnessed her gradual decline from a distance, especially exacerbated by pandemic-related travel restrictions. Guilt, regret, resentment, and personal health concerns intensified my emotional turmoil. As of May 2022, my mother has reached the final stages of Alzheimer's. Witnessing my mother's journey with dementia, coupled with the looming

⁷<https://refikanadol.com/works/machine-hallucinations-nature-dreams/>

prospect of facing a similar fate, has prompted deep reflection on the nature of existence from various angles. It has reshaped my perception of time and mortality, motivating me to live a life devoid of future regrets. Through my artwork, I aim to explore these sentiments and transcend the fear that I may inherit and share with others.

Methodology *Remembrance: Magma* is a project designed to help me interpret the distortion of memory and space between myself and my mother. I decided to approach memory from a literary perspective.

"Remembrance: Magma" serves as a project aimed at exploring the interplay of memory and space within the context of my relationship with my mother. My approach to memory was inspired by a literary perspective, as the classic narrative form offers a familiar and versatile container for both conceptual and emotional content. This approach allows people to readily engage with the content, as they are accustomed to suspending disbelief within the bounds of this narrative framework. The classic narrative form is an exceptionally useful container for conceptual and emotional content because it is so familiar. Most people are very willing to suspend disbelief and open their minds within the bounds of this familiarity. When I read my mother's translation of W.B. Yeats' poetry⁸ in Korean as a child I found it boring and unattractive, but when I rediscovered his work in English after moving to the United States I realized how rich and beautiful his poetry really is. The fact that my mother loved him a long time ago, gives my own enjoyment a sense of being lifted out of time, and I felt that his work would be the appropriate source of narrative for *Remembrance*.

I created a new poem in English in collaboration with the Natural language processing (NLP)⁹ text generating program GPT-2.¹⁰ After feeding a volume of Yeats' collected works into GPT-2¹¹ it produced a poem in Yeats' style, which I then edited into a finalized form.

After printing it, I cut it with scissors to reconstruct it, and here I made a new poem. I had to edit the generated poem so that it flowed more naturally. I divided the writing into 4 different parts depending on the mood and

⁸ Collected Poems of WB Yeats (Wordsworth Poetry Library) Collected Poems of W.B. Yeats (Wordsworth Poetry Library) : Yeats, W. B., Watts, Cedric: Libros - Amazon.Tapa blanda – 1 septiembre 2000

⁹ Natural language processing (NLP) concerned with giving computers the ability to understand text and spoken words in much the same way human beings can.
<https://www.ibm.com/cloud/learn/natural-language-processing>

¹⁰ GPT-2 is an unsupervised deep learning transformer-based language model. The model is open source and is trained on over 1.5 billion parameters to generate the next sequence of text for a given sentence.

<https://dzone.com/articles/gpt-2-gpt2-vs-gpt-3-gpt3-the-openai-sh> owdown

¹¹https://colab.research.google.com/github/ilopezfr/gpt-2/blob/master/gpt-2-playground_.ipynb

temperature of a single line. Next, I used the text from this poem to create images using a text to image AI program, which ended up being exceedingly surreal. This was exceedingly welcome to me because I feel that Surrealism is perhaps the most effective method of conveying the realities of the unconscious mind. Its ways of twisting, separating, and synthesizing the mundane and realistic objects or situations into the most surprising forms is very similar to elements of the function of human memory.

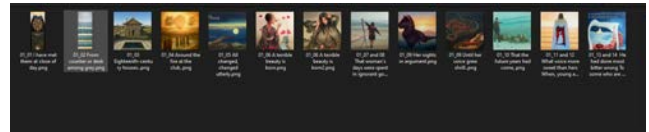


Figure 3: "Remembrance: Magma" (2022), new poem and images making progress ©Copyright Chanee Choi

After each section of the poem was translated into an image by GPT-2, I selected the most aesthetically successful and arranged them in order. I then began to storyboard, planning the scenes, timing, lighting, and sound in detail. At first I used the storyboarding techniques of the film industry, but I found that this left quite a lot of room for explanation or dialogue, but was insufficient to record all the minute moving details necessary for animated characters, and I ended up adjusting this technique to allow me to articulate the detailed movements of this animated film.

It was necessary for this world that I had created in collaboration with machine learning to be experienced by the viewer through the first person and third person perspective of one main protagonist so that they would have a point of orientation within the chaotic surrealism of the scenes. This should be a familiar style for many viewers as they are classic perspectives of the protagonist of a video game. This protagonist is patterned after images I found of my mother at my own age. When I first modeled a 3d figure based on these images I found I had rendered a character that seemed unrealistically perfect, so I adjusted her face to include aspects of myself from a photograph, and the character became a hybrid.



Figure 4: On the left is "Remembrance: Magma" (2022), mother's portrait, on the right is "Remembrance: Magma" (2022), character making progress ©Copyright Chanee Choi

Conclusions

This project, connected to Remembrance: Coral, offers exciting potential for further practice-based research. In Remembrance: Coral, I assume dual roles as both the creative force and the participant. By utilizing Electroencephalography (EEG) input as both a technological medium and a metaphor for memory's fleeting nature, I have transformed the 3D animations from Magma into an interactive video game. This transformation involved using the Unity game engine's Cinemachine, enabling me to remove preset animations and transition interactively. The narrative of the game is driven by my own brain waves, captured with EEG electrodes, and translated into visual abstractions. Through the Blitz digital art residency program, I conducted live streaming shows on Zoom, where the artist's concentration fluctuations influenced the gaming experience. Categorizing brainwaves into 'concentrated' and 'not concentrated' states adds urgency to the narrative. Maintaining focus allows the story to unfold, offering a profound exploration of Alzheimer's complexities. Lapses in concentration symbolically disintegrate visual elements, vividly representing the unpredictable impact of the disease on memory. The significance of the Hangul alphabet font lies in its reflection of Korean identity in a globalized context, a theme I aim to convey through visuals. By confronting my fears in an immersive public setting, I delve into the intricate facets of Alzheimer's while reclaiming my identity and agency from the shadows of my family's medical history. As dementia erases a person's memory, the brain remains a sensor relentlessly seeking data collection. The Remembrance project poses the question: What do we become when this process unfolds?

Acknowledgements

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Figure 5: "Remembrance: Coral" (2023), ©Copyright Chane Choi

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