ASSEMBLING MEMORIES: A Concept of the Architectural Worldmaking of Memories in the Metaverse

by
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Author's Declaration

I hereby declare that I am the sole author of this thesis.
This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

This thesis explores the relationship between architecture and memory by investigating the use of immersive virtual environments (Metaverse), for recording and sharing memories by transforming personal experiences into collective architectural elements. Utilizing geolocation and augmented reality (AR) technologies, individuals document their memories of urban spaces through TikTok, which are then analyzed to extract significant characteristics to be transformed into architectural components. These digital representations are aggregated into a virtual collective memory world.

Taking Japanese Village Plaza in Little Tokyo, Los Angeles as a testing ground, this thesis proposes a design concept for an architectural memory assembly interface within the Metaverse. Through virtual overlays, users engage with these spaces, creating a more immersive, dynamic, and collaborative memory experience compared to traditional preservation methods. The thesis outlines a framework for utilizing these technologies to develop a shared, evolving memory world, where users co-create spatial experiences that merge personal and collective memories in the Metaverse.

Acknowledgments

This thesis marks the culmination of an incredible journey, one that would not have been possible without the guidance, encouragement, and support of so many individuals.

First and foremost, I would like to express my deepest gratitude to my supervisor, Professor Philip Beesley, for his invaluable guidance and insightful feedback throughout the process. His expertise and encouragement have been instrumental in shaping the direction and depth of this thesis.

I am equally grateful to Professor Terri Boake, my co-supervisor, for her thoughtful advice and unwavering support, which have enriched my work in countless ways.

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Lastly, I want to acknowledge a very special member of my family, my cat, Enzo, who was by my side throughout this thesis journey. His companionship brought comfort and joy during the challenging times. In the final days before completing this work, Enzo passed away, leaving a profound void. This thesis is as much a testament to his presence as it is to my academic endeavor.

To all of you, my heartfelt thanks. This work is a reflection of the collective support, insights, and kindness that surrounded me during this transformative period.

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Preface

In my thesis, the concept of the memory world can be likened to a city model kit (Figure 1), where each individual's memory of a shared location is like one of the small pieces within the kit. Just as those pieces can be freely assembled to form a complete, tangible city model, so too can individual memories be combined to construct an intangible collective memory world. This dynamic assembly process allows memories to interact, reshape, and evolve over time, creating a new urban experience within the virtual environment.

Similarly, building Gundam models (Figure 2) involves putting together many small parts to form a larger, cohesive model. Every tiny component has its own unique shape and function, but it's only when they are carefully assembled that they form the recognizable Gundam figure. In the same way, each person's memory contributes a "piece" to the larger memory world—every memory retains its individuality, but when combined with others, it forms an dynamic collective recollection.

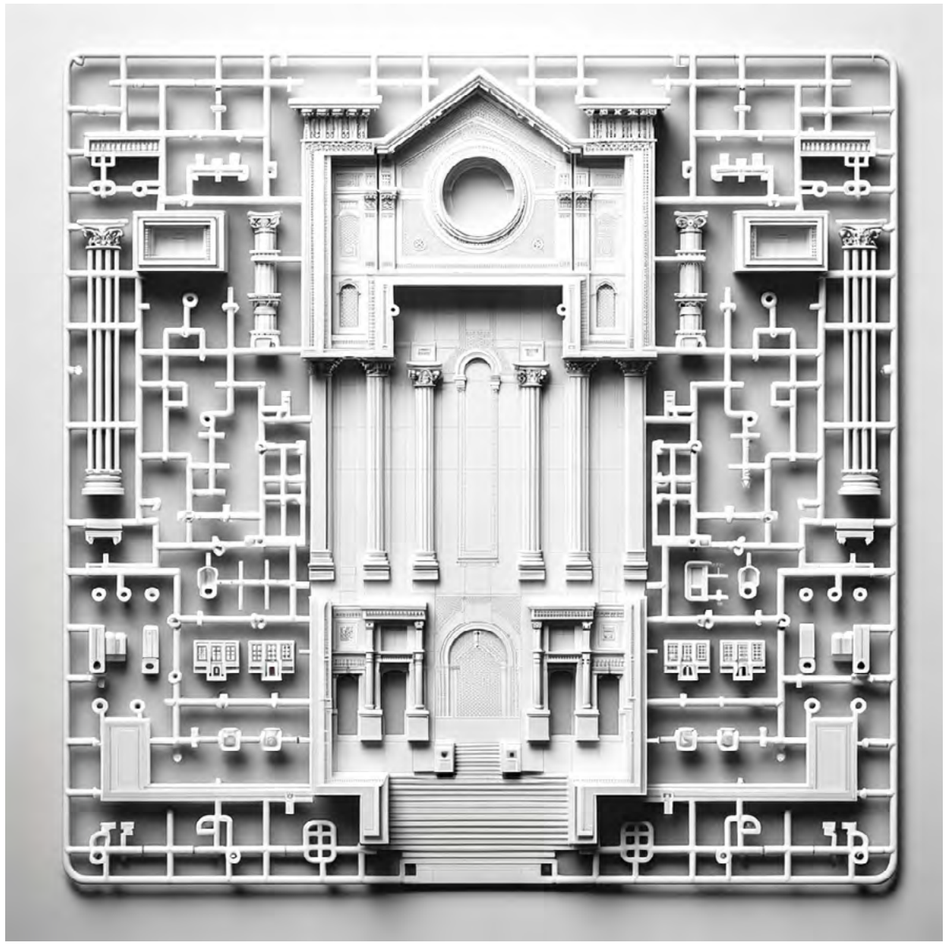


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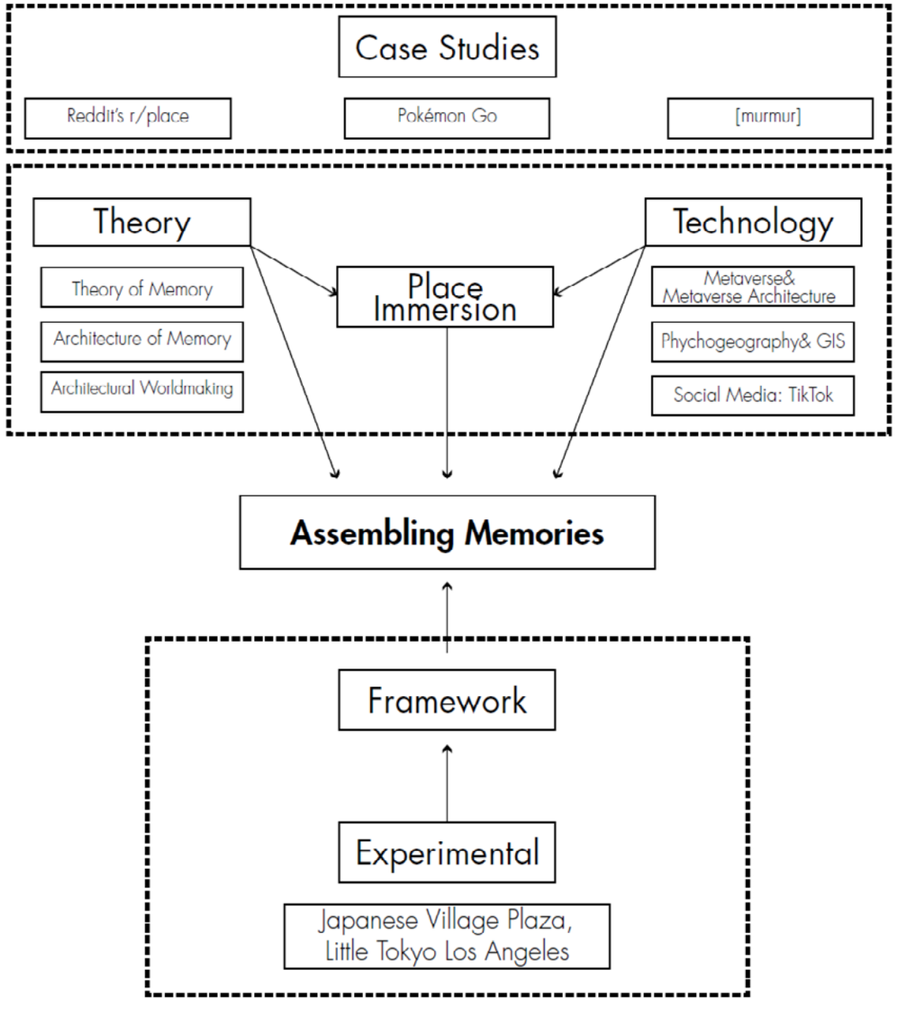


Figure 4: Thesis Framework
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Overview

Introduction

The thesis “Assembling Memories” explores the complex relationship between architecture and memory, proposing a contemporary approach to recording and sharing memories in the digital age. My goal is to design a user interface concept for architectural memory assembly within the Metaverse. The conceptual platform captures data from TikTok, transforming recordings into architectural components. It leverages the Metaverse to blur the boundary between the physical and digital worlds, utilizing AR technology to bring the scenes to life, with architectural worldmaking as its foundation.

The thesis takes Japanese Village Plaza in Los Angeles as a testing ground and proposes a concept design framewrok of moving from personal to collective memory. Here, users can create and assign memories recorded through social media, such as TikTok, to specific architectural elements, creating personal “triggers” such as window frames, columns, trees, etc. Each trigger links to individual memories. As they explore and record in the “memory hotspot”, users can interact together in a physics-based world by orgranizing with other users to collaboratively construct virtual world, which would be a new definition of the collective memory. As structures are built within the platform, they appear in a large map, showing a memory world standing on the physical world. Here, users can not only create their personal memory-architecture elements, share their memories with others, but collaborate on a large memory aggregation. (Figure 5)

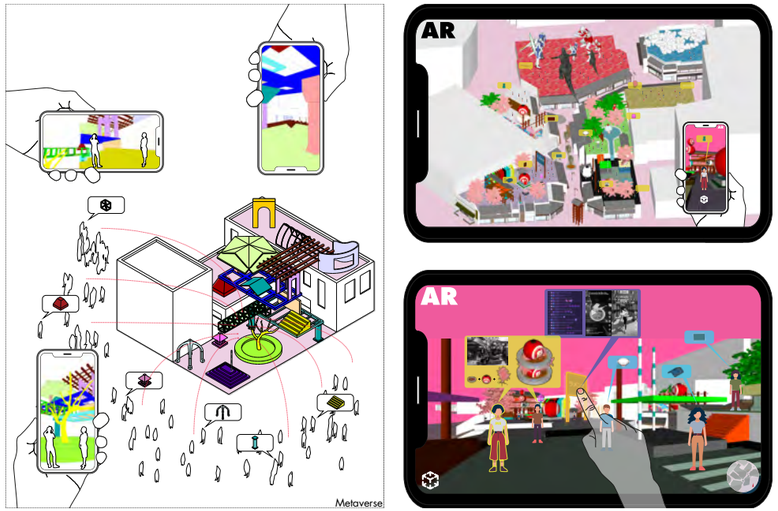


Figure 5: Design Framework Diagram & User Interface by Author

On a larger scale, the proposed virtual platform allows users to explore an expansive memory world, with Los Angeles as the blueprint. This concept expands the city’s memory landscape by establishing “memory islands” and connecting them to create an urban experience of memories. The platform builds upon Los Angeles’ existing zoning plan and uses data from TikTok posts to identify “memory hotspots.” These hotspots are marked on the digital map, serving as key reference points for users to explore and interact with. Users can either follow these hotspots as part of a broader tour or zoom in to smaller locations for a more detailed, participatory experience. (Figure 6)

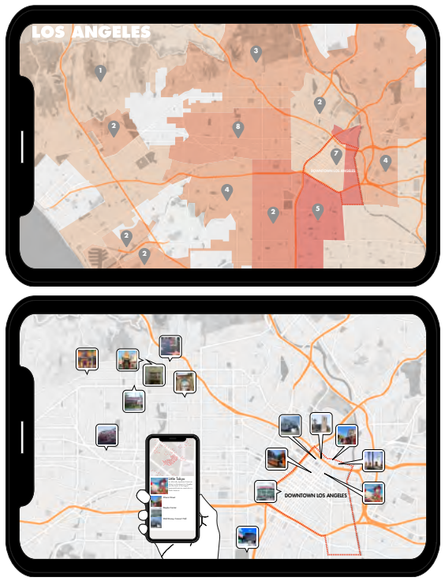


Figure 6: Large-scale User Interface by Author

Research Questions

The research addresses several key questions: How can an immersive virtual environment (Metaverse) support the recording of individual memories? How do we determine what characteristics should be extracted from these memories? How can architectural representation be utilized to assemble and transform these memories into a collective form? By exploring these questions, the thesis aims to contribute to the ongoing discourse around virtual space design and memory preservation.

Structure

The thesis is divided into three main parts: the theory, the technology, and the practice. The "theory" section delves into the significance of memory, social media as the memory carrier, and transition to the virtual world,

establishing the theoretical foundations and explaining why I am interested in memory recording. This section sets the stage for understanding the importance of memory preservation in architecture, highlighting how traditional methods are evolving in the digital age.

The "technology" section shifts focus to contemporary technologies and methodologies, such as the Metaverse, Geographic Information Systems (GIS), psychogeography, and architectural worldmaking. These tools and concepts provide the necessary guidelines and technological means to achieve the thesis's objectives. This section underscores how modern technologies can innovate the ways we record and share memories.

Both theory and technology sections combine to introduce **place immersion**[1]—the idea that by integrating virtual and physical spaces, a new kind of memory world can be created. The thesis suggests that place immersion can redefine public spaces, allowing these environments to act as dynamic repositories of personal and collective memories. By blurring the line between the digital and physical realms, these immersive spaces offer a way for users to actively engage with memories, continuously shaping and reshaping them over time. The result is a new framework for understanding how memory functions in both architectural and virtual contexts.

In the "practice" section, the thesis moves towards practical application, proposing a "phygital"[2] memory world platform interface that combines physical and digital elements using Tiktok as a database. I present a comprehensive framework for establishing this world, using Little Tokyo in Los Angeles as a testing ground to illustrate the concept of assembling memories. This section demonstrates the practical implications of the

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(1). Place Immersion: Place immersion is conceptualized as a neuropsychosocial phenomenon, involving interactions between spatial, neurological, psychological, and social factors. It describes how individuals become deeply engaged with and attuned to their surrounding environments, leading to immersive experiences that are rich, engrossing, and relatively free from distractions.
Buttazzoni, Adrian, et al. "Toward conceptualizing "place immersion" as a spatial neuropsychosocial phenomenon: A multidisciplinary meta-review and-synthesis." Journal of Environmental Psychology 81 (2022): 101810.
See Chapter: Place Immersion

(2). Phygital: A concept of using technology to bridge the digital world with the physical world with the purpose of providing a unique interactive experiences for the user.
Del Vecchio, Pasquale, Giustina Secundo, and Antonello Garzoni. "Phygital technologies and environments for breakthrough innovation in customers' and citizens' journey. A critical literature review and future agenda." Technological Forecasting and Social Change 189 (2023): 122342.

theoretical and technological discussions, providing a concrete example of the envisioned memory world.

Case Studies

Integrating insights from various theories, I conducted several case studies to provide practical insights into the feasibility and application of the proposed method and to refine my final objective.

- Wist[1]: Wist's ability to capture and share immersive memories by converting videos into 3D experiences mirrors my thesis's use of TikTok videos to transform personal memory recordings into spatial, architectural components for users to explore and share in a virtual environment.

- Decentraland[2]: Similar to Decentraland's user-generated virtual spaces, my design framework enables users to assemble their own memory world, where they can collaboratively shape the urban memory landscape by interacting with architectural components based on personal memories.

- Pokémon Go[3]: Pokémon Go's use of augmented reality and geolocation to connect digital gameplay with physical spaces aligns with my thesis's integration of AR and GIS, allowing users to engage with memory hotspots across a city, combining virtual and physical experiences.

- Streetmuseum[4]: Streetmuseum overlays historical images onto real-world locations through AR, a technique echoed in my design

1. Wist Labs, https://wistlabs.com/.
2. Decentraland, https://decentraland.org/
3. Pokémon Go, https://pokemongolive.com/
4. Streetmesuem, https://streetmuseum.app/

where architectural elements derived from personal memories are overlaid onto real city maps, allowing users to visualize past and present in tandem.

- Reddit's r/place[5]: In r/place, users collaborate to create a large, evolving canvas, reflecting my thesis's participatory design process where users can collectively shape the memory world by contributing and assembling their personal architectural components into a larger, shared urban memory.

- [murmur][6]: [murmur] captures oral histories tied to specific places, much like how my design uses personal memories from TikTok posts to inform the architectural components, transforming individual memories into collective, spatial experiences in the virtual platform.

Concept Design Framework

This thesis proposes a framework for designing virtual environments that integrate personal and collective memories. The framework is centered around the creation of emotionally immersive spaces using AR technologies, informed by user-generated content and psychogeographic principles. It highlights the participatory aspect of architectural worldmaking, where users contribute their memories and experiences to the creation of shared virtual spaces.

The proposed platform allows users to generate a collective memory world by transforming TikTok posts from specific locations into architectural components. These components act as triggers for memory recall, embedding personal memories into tangible architectural elements. Users can freely insert and assemble these elements, constructing a

5. Reddit's r/place, https://www.reddit.com/r/place/
6. [murmur], https://cfccreates.com/content-hub/murmur/

"city memory body." By removing traditional constraints like gravity and texture, these components take on new forms—such as "columns" or "windows"—reflecting user preferences. The process follows an organic and collage-like method, where individual memory fragments evolve and intertwine through shared contributions. In this design, organicism[3] goes beyond just biological growth; it represents the natural co-evolution of human memories. As users contribute and interact, their memories weave together, shaping a living memory world that evolves through collaboration, branching out and reaching far into an almost infinite number of different dimensions. The memory world develops fluidly, as users' collective efforts continuously reshape the architecture. The collage approach ensures that distinct memory pieces retain their individuality while contributing to a dynamic, ever-evolving collective urban memory.

This concept draws on artistic and architectural movements such as Cubism[4] and the Chinese art form of 锦灰堆 (Heaps of Brocade and Ash)[5] to frame the organic layering of memories. Both techniques use fragmented pieces—whether sentimental objects, text, or images—to create a unified whole, while each fragment maintains its individual identity.

Braque's Cubist collages layered diverse materials like newspaper clippings and textures, creating multi-dimensional compositions that reflect various perspectives.[7] 锦灰堆 (Heaps of Brocade and Ash) follows a

(3). Organicism: Organicism is an architectural and design concept that emphasizes natural growth and harmony, where different parts come together to form a cohesive whole, similar to how living organisms develop and adapt. It focuses on creating structures that blend with their surroundings in a fluid, natural way, promoting integration with the environment rather than rigid, artificial designs.
Benedetta Ricci, The Harmony of Form and Function: Frank Lloyd Wright's Organic Architecture, Artland Magazine, https://magazine.artland.com/when-form-meets-function-frank-lloyd-wright-organic-architecture/. Accessed 18 Jan. 2025.

(4). Cubism: Cubism is a 20th-century art movement started by Pablo Picasso and Georges Braque around 1907-1914. It breaks objects into geometric shapes and shows them from different angles at the same time, challenging traditional ways of painting and representing space. Instead of copying what we see, it offers a more abstract and intellectual view of reality.
"Cubism." Encyclopaedia Britannica, Encyclopaedia Britannica, Inc., https://www.britannica.com/art/Cubism. Accessed 18 Jan. 2025.

(5). 锦灰堆 (Heaps of Brocade and Ash): A traditional Chinese art style that combines painting and collage. It is a form of still-life painting that shows a mix of objects like antiques, letters, seals, calligraphy, and everyday items, arranged to look casually piled together. "锦灰堆——古人的'垃圾'艺术." 艺术中国, 26 Oct. 2020, http://art.china.cn/txt/2020-10/26/content_41336970.shtml. Accessed 18 Jan. 2025.

similar approach, combining historical or personal fragments to form an artwork that respects the individuality of each piece while contributing to a unified structure.[8] In the thesis, these ideas are reflected in how personal memories are spatially represented as architectural elements, coming together to build a collective narrative that is constantly reshaped by new contributions.



Figure 7: Fruit Dish and Glass
Charcoal and cut-and-pasted printed wallpaper with gouache on white laid paper; subsequently mounted on paperboard
by Georges Braque
1912, The Metropolitan Museum of Art, https://www.metmuseum.org/art/collection/search/490612.



Figure 8: 锦灰堆
Design a sketch of overlapping small things, such as old pages of books, crumpled paintings, yellowed newspapers, and even tickets and stamps.
by Xuezhi Geng
https://collection.sina.com.cn/zgsh/20110113/144312105.shtml.

7. Barcio, Phillip. "The Abstraction of Cubist Collage." Ideelart, 3 May 2016, www.ideelart.com/magazine/cubist-collage. Accessed 21 Oct. 2024.

8. "Two Minutes of Art | What Is the Ancient Version of 'Trash Art' – Jin Hui Dui?" Yangtse, www.yangtse.com/content/1511102html. Accessed 21 Oct. 2024.

In the context of architectural worldmaking, this collage-like methodology aligns with Piranesi's Plan of Campo Marzio, which combines real and imagined elements of ancient Rome into speculative urban design. Similarly, Sam Jacob's "Empire of Ice Cream" explores architecture through fragmented plans and stylistic variations, creating a hybrid, evolving architectural field. These precedents echo the thesis's approach, where user-generated content is transformed into fragmented architectural components that users can freely assemble.

To validate this concept, Japanese Village Plaza in Little Tokyo, Los Angeles, is selected as the testing ground. This site demonstrates how, under this framework, the final "assembling memory" can emerge as an interactive, shareable, and collaboratively built urban memory collective. The platform, linked to TikTok as a memory database, showcases how personal memories can organically transform into a dynamic, evolving architectural expression, shaped and sustained by the interactions of different users.

Summary

The thesis "Assembling Memories" dives into the complex relationship between architecture and memory, presenting a contemporary approach to recording and sharing memories in our digital age. It utilizes immersive virtual environments, psychogeography, Geographic Information Systems (GIS), and augmented reality (AR) technologies to create a dynamic virtual public memory collection. The thesis concludes by providing a framework and then proposes an implementation platform. To better support my exploration and give the reader a better understanding of what the end goal is, in the design section I chose the Japanese Village Plaza as a testing ground to visualize one of the platform's possibilities under the framework and provide an in-depth analysis of this case.

This project explores the feasibility and potential of using the Metaverse to record and share memories, offering new insights for a virtual collective memory world built upon a physical world. By utilizing the immersive and interactive capabilities of the Metaverse, this approach aims to not only preserve individual and collective memories but also provide a platform for users to share and engage with others to better create a "memory world" and connect the digital and physical worlds.

ASSEMBLING MEMORIES

MEMORY

We use our memories to maintain our personal identity, to start and mediate relationships, to shape our likes and dislikes, to regulate our moods and solve problems.[9]

9. Van Den Hoven, Elise, Corina Sas, and Steve Whittaker. "Introduction to this special issue on designing for personal memories: past, present, and future." Human–Computer Interaction 27.1-2 (2012): 1-12.



Figure 9: The Persistence of Memory
Much like Dali's melting clocks that distort traditional concepts of time, the architectural memory components represent personal memories that evolve fluidly in virtual spaces. These memory fragments, embedded in the Metaverse, allow users to engage with memories that are continuously reshaped by their interactions and contributions.
by Salvador Dali
1931, The Museum of Modern Art, New York. https://www.moma.org/collection/works/79018.

Theory of Memory

Memory functions as a foundational cognitive process, deeply connected to personal identity and cultural continuity. It operates through the mechanisms of encoding, storage, and retrieval, influencing how individuals perceive and interact with the world around them.[10]

Maurice Halbwachs' theory of collective memory offers a key perspective, arguing that memory is not solely an individual process but is shaped by social interaction. Collective memory is constructed and maintained through engagement in shared spaces, continuously reinforced by the communities in which people live. According to Halbwachs, physical environments—especially those with cultural significance—play a crucial role in anchoring these collective memories. Urban spaces, monuments, and buildings become vessels for shared historical and cultural narratives, embedding these experiences into their spatial forms.[11]

This connection between memory and architecture emphasizes that built environments are not simply passive structures but active participants in shaping and preserving collective memory.[12] Traditionally, physical objects and spaces—such as monuments, buildings, and personal mementos—serve as tangible containers for both personal recollection and collective memory. Public spaces, landmarks, and culturally significant buildings evoke memories, allowing societies to remember and reflect on their shared histories. Such spaces often serve as lieux de mémoire—places where cultural and historical memories are deliberately maintained and recalled.[13] In essence, memory within architecture is not only a means of preserving the past but also an active process that influences how individuals and communities interact with and understand their surroundings.

10. Squire, Larry R. "Memory and brain systems: 1969–2009." Journal of Neuroscience 29.41 (2009): 12711-12716.

11. Halbwachs, Maurice. On Collective Memory. University of Chicago Press, 1992.

12. "Please refine and rewrite the following text to make it sound more academic and professional" Prompt. " OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

13. Nora, Pierre. Realms of Memory: The Construction of the French Past. Columbia University Press, 1996.

In the evolving digital landscape, the traditional relationship between memory and space is being transformed.[14] Virtual environments, like those found in the Metaverse, offer new opportunities for the recording and sharing of memories, extending these experiences beyond the physical world. This shift introduces innovative possibilities for how architecture and space can continue to serve as mediums for memory preservation, incorporating both digital and physical elements.

Colin Ellard's work on "place immersion" further bridges this gap between physical and virtual memory spaces.[15] Immersive environments allow users to experience memory in a multi-sensory, interactive manner, deeply engaging with both personal and collective experiences. This immersive quality reinforces the role of architecture—not just as a static container for memories but as a dynamic space that fosters memory creation, interaction, and continuity across both the physical and virtual worlds.[16]

14. "Please describe the traditional reationship between memory and space in the digital age!" Prompt. OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

15. Buttazzoni, Adrian, et al. "Toward conceptualizing "place immersion" as a spatial neuropsychosocial phenomenon: A multidisciplinary meta-review and-synthesis." Journal of Environmental Psychology 81 (2022): 101810.

16. "Please refine and rewrite the following text to make it sound more academic and professional" Prompt. " OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

Social Media as a New Medium for Recording, Sharing, and Disseminating Personal Memories

In the digital age, social media platforms have changed the way we record and share personal memories. These platforms, with their vast reach and interactive features, provide new opportunities for creating and preserving memories that go beyond traditional methods. Platforms like Facebook, Instagram, and TikTok allow users to capture moments in real-time, creating a digital archive of personal experiences. Unlike traditional photo albums or diaries, social media content is easily accessible, shareable, and interactive. This immediacy and connectivity enable users to engage with their memories and the memories of others in unprecedented ways.[17]

TikTok is a short video platform widely popular for its easy-to-use editing tools and global interactive features. Focusing on trends, challenges, and narratives, it helps users record, share, and save moments of their lives in a short period of time; features such as likes and comments also allow individual memories to converge into a collective memory. With algorithmic recommendations, users' content can be widely distributed to form a public digital archive, which fits the concept of "collective memory."[18]

The integration of TikTok into architectural worldmaking is important. Architects and city planners can learn about how people interact with their environment and their emotional needs through videos of street art, community events, and historical landmarks filmed by users.[19] They can then optimize urban design by adding more artistic elements to public spaces, flexibly placing social spaces, or highlighting cultural heritage to make these places more attractive and humane.[20] With TikTok's real-time feedback and engagement, people's experiences and suggestions can be quickly compiled to help designers improve the urban environment and build a more cohesive collective memory online and offline.[21]

17. Shanmugasundaram, Mathura, and Arunkumar Tamilarasu. "The impact of digital technology, social media, and artificial intelligence on cognitive functions: a review." Frontiers in Cognition 2 (2023): 1203077.

18. Abidin, Crystal. "Mapping internet celebrity on TikTok: Exploring attention economies and visibility labours." Cultural science journal 12.1 (2021): 77-103.

19. "Please refine and rewrite the following text to make it sound more academic and professional" Prompt. " OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

20. "Please describe the advantages of using Tiktok into architectural worldmaking in urban design" prompt OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

21. Shan, Cao. "The Construction of City Image in Short Video: A Case Study of Xi'an in the Short Video of Douyin." 2020 5th International Conference on Humanities Science and Society Development (ICHSSD 2020). Atlantis Press, 2020.

Transition to the Virtual World

The advent of social media platforms like Facebook, Twitter(X), and Instagram has enabled the digital recording and sharing of personal memories on an unprecedented scale. As technology advances, there is an increasing demand for more sophisticated ways of perceiving and interacting with memory beyond theses social medias. This demand has led to the development of concepts that transition memory recording from the physical to the virtual world.[22] Wearable technology, such as smartphones and smartwatches, allows for constant memory recording and immediate sharing.[23]

Virtual environments leverage dynamic systems, interactive technologies, and sensory design to enhance how individuals interact with and immerse themselves in their memories.[24] By creating virtual spaces that allow users to actively engage with and revisit their memories, this transition not only preserves the essence of past experiences but also enhances their accessibility and emotional impact.[25] This evolution reflects a deeper, more interactive connection between individuals and their memories, offering new possibilities for memory preservation and engagement in the digital age.[26]

Furthermore, the shift from traditional methods of memory recording to virtual world memory recording expands the narrative nature of memory itself.[27] In physical forms such as photographs or texts, memories tend to be static snapshots of moments in time. However, in virtual environments, memories can be dynamic and constantly overlapping, allowing for more complex memory aggregation. Memories can be dynamically revisited and experienced, providing a continuous narrative that evolves with user interaction. This technological advancement not only preserves memories but also transforms them into a living world, allowing people to explore

22. "Expand what I write before" prompt. OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

23. Bartoletti, Roberta. "Memory and social media: new forms of remembering and forgetting." Learning from memory: Body, memory and technology in a globalizing world (2011): 82-111.

25. Brejzek, Thea, and Lawrence Wallen. "Worldmaking through the virtual model." Theatre and Performance Design 7.1-2 (2021): 116-133.

25. "Please refine and rewrite the following text to make it sound more academic and professional" Prompt. " OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

26. Cavazza, Marc, et al. "New ways of worldmaking: the Alterne platform for VR art." Proceedings of the 12th annual ACM international conference on Multimedia. 2004.

27. "More advantage of shifting to virtual world of memory recording" Prompt. OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

and share memories in more meaningful and emotionally mobilizing ways.

One example of this transition is the application Wist, which enables users to capture and share immersive memories by simply taking a video. Users can walk through these memories in VR and mobile AR. The app captures 3D information about the world while recording, which is then processed and compiled into a high-definition video format. When viewed in mobile AR or VR, users see their memories projected back into 3D. In VR, users can even join each other to view memories together. (Figure 10) This innovative approach to memory recording and sharing highlights the potential of virtual spaces to create emotionally engaging and interactive experiences that bridge the gap between the digital and physical worlds.[28]



Figure 10: Step inside your memories by Wist Labs
https://wistlabs.com/.

28. "Wist Labs." Wist Labs, https://wistlabs.com/.

Metaverse & Mateverse Architecture

We need to learn to enjoy living in a digital sphere, develop a unique way of owning and curating objects and artworks.[29]

29. "Should Interior Designers Be Paying Attention to the Metaverse?" KGD Architecture, KGD Architecture, 17 Feb. 2022, www.kgd-a.org/press/en/should-interior-designers-be-paying-attention-to-the-metaverse.



Figure 11: Fantasy about the Metaverse
Through AR technologies and immersive virtual spaces, the Metaverse enable to serve as a dynamic memory repository, enabling users to contribute, share, and continuously reshape their experiences within a living, adaptable architectural memory world.
Precedent Generated by
Midjourney, Midjourney ver 5.2, Midjourney Inc., June 15, 2024.
The Robot Credited to
City mode, Kael, 2024, Deezer
https://www.deezer.com/en/album/636169751
Redrawn by Author

Everything about the Metaverse

There have been a lot of talks recently about the "metaverse," sparked by Mark Zuckerberg's repeated assertions that building virtual worlds is his company's next big goal. "The Metaverse becomes the gateway to most digital experiences, a key component of all physical ones, and the next great labor platform."[30] The concept of metaverse was coined decades ago by science fiction writer Neal Stephenson, and technicians have been writing about it ever since. "Metaverse is the name used to name an immersive, collective and hyper-realistic virtual environment, where people will be able to live together using 3D customized avatars."[31]

> *"The metaverse, in a nutshell, is the digital world, where anything we can imagine can exist. Eventually, we'll be connected to the metaverse all the time, extending our senses of sight, sound, and touch, blending digital items into the physical world, or popping into fully immersive 3D environments whenever we want. That family of technologies is known collectively as extended Reality (XR)."*[32]

At a time when the concept of the metaverse is prevalent, architecture has also caught up and is deeply involved in the forefront of the technological trend for the first time in recent times. Numerous science fiction works have depicted the world experience of the meta-universe future, but its architecture and hardcore technological foundation are superbly experiential.[33] Architects, or what could be called virtual world scene architects, will use the paper architecture of previous generations in the future to provide a whole new world experience, and here we can divide it into two categories: a realistic scene under a virtual story, and an anti-realistic architectural scene.[34]

30. Matthew Ball. "The Metaverse: What It Is, Where to Find it, and Who Will Build It" Matthewball.co. Jan 13, 2020. https://www.matthewball.co/all/themetaverse

31. Stephenson, Neal. Snow Crash. New York, Bantam Books, 1992.

32. Eric Elliott. "State of the Metaverse 2021." Published in The Challenge. Jan 2, 2021. https://medium.com/the-challenge/state-of-the-metaverse-2021-9f032fed655b

33. "Please refine and rewrite the following text to make it sound more academic and professional" Prompt. " OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

34. Mark Purdy. "How the Metaverse Could Change Work." Harvard Business Review. April 05, 2022. https://hbr.org/2022/04/how-the-metaverse-could-change-work#:~:text=The%20metaverse%20seems%20set%20to,eventual%20rise%20of%20a%20metaverse

New Architecture in the Virtual Era

Virtual space is not a new phenomenon, nor is it limited to computers. In virtual space theory, "virtual space" is defined as including space created by any medium capable of describing space, rather than the immediate physical environment.[35] The medium shifts from the physical product itself to the drawing that describes the intended physical product. However, the arrival of a technological singularity will likely make possible unprecedented realistic visual simulations of physical spaces.[36] While the architectural industry is closely following the rapid rise of virtual reality, they see it primarily as a tool for designing and visualizing spaces planned for the physical world. Architects should view virtual reality not just as a design tool and a medium for creating visualized physical spaces, but as the design itself. Designing virtual reality experiences is a complex problem that requires expertise from a range of different fields, such as user interface and interaction design, information design, character design, and game design.[37] However, as mentioned earlier, what seems to be missing from existing virtual reality experiences is an empathetic scenario experience, and architects will make an important contribution to spatial design.[38]

However, there is a tendency in the contemporary creation of virtual spaces where the virtual reality experience does incorporate spatiality but replicates the physical world too closely. Virtual reality spaces present different opportunities and limitations than physical spaces.[39] Certain physics may no longer impose the same constraints on form and movement in virtual reality spaces as they do in physical spaces, but designers need not see this as necessary to discard all constraints either because, in my opinion, the particular experiences that come with materials in the real physical world will be able to be amplified. The focus of the new architectural concern in the virtual age will then shift from the balance of

35. Benedikt, Michael. Cyberspace: First Steps. MIT Press, 1991.

36. Kurzweil, Ray. The Singularity Is Near: When Humans Transcend Biology. Viking, 2005.

37. "Describe the virtual reality experiences in the future" prompt. OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

38. Maruko.Lin, "Metaverse and Virtual Architecture" JZDA, 26 May. 2022, https://www.jzda001.com/index/index/details?type=1&id=10325.

39. "Describe the virtual reality experiences in the future" prompt. OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

real physical quantities and physical laws to extremes. This is undoubtedly, at a superficial level, extremely friendly to architects whose minds are set free.[20]

At present, the field of theoretical research in architecture is increasingly biased toward the philosophical interpretation of texts. The deep contradiction between this design and interpretation is rooted in the fact that the social impact of a building is relatively limited, which, of course, greatly hinders the context of construction and the power of communication of the building.[41] In the metaverse, new worldviews will be established and new social issues will be explored.[42] At this moment, it is all the more necessary to revisit the social discourse explored in "Ghost in the Shell 2: Innocence" (Figure 12), a kind of human emotion under the auspices of urban empathetic space that will push the profundity of architecture to the extreme.[43]

Mamoru Oshii constructed the grand cyberpunk world of his 1995 film Ghost in the Shell, whose metaphysics ultimately seemed less concerned with ontology than with phenomenology. Another visual theme the work shares with its predecessor is that of mirrors or reflections in a broader sense. Continued networking allows for a detachment of human consciousness from the physical body, fundamentally altering our definition of what it means to be human.[44] For Hayles and Haraway, this removal of the importance of the biological body has been the basis of posthumanism. Hayles constructs this perspective in her posthumanist theory and critique of Dick's novel, while Haraway focuses on cyborgs and how

40. Andreea Cutieru. "The Architecture of Virtual Environments: Designing for the Metaverse." Published in ArchDaily. April 22, 2022. https://www.archdaily.com/980632/the-architecture-of-virtual-environments-designing-for-the-metaverse

41. "social problem of architecture in the digital age" prompt
OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

42. Steuer, Jonathan, Frank Biocca, and Mark R. Levy. "Defining virtual reality: Dimensions determining telepresence." Communication in the age of virtual reality 33 (1995): 37-39.

43. Oshii, Mamoru. Ghost in the Shell. Toho Co., Ltd., DreamWorks Pictures, Madman Entertainment, 2004.

44. "summarize Ghost in the Shell " prompt
OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

cyborgs can provide our liberation.[45] [45] Body-mind dualism is one of the major themes of Ghost in the Shell, as its title suggests that "ghosts" are embodiments of the mind, human consciousness, and "shells," bodies, or a form. This important thread leads to Hayles' study of posthumanism, in which she identifies the detachment of the biological matrix as an element of the posthuman.[47] Hayles suggests that posthumanists view "the body as a primitive prosthesis," so it is natural to extend or replace it with other prostheses. In this case, Cyborg is a perfect example of this posthuman perspective. As this dualism is explored, we can see that in the foreseeable future, the traditional five senses of perceiving architectural space will begin to be gradually stripped away and modified.[48] Traditional architecture is a material space that carries spiritual connotations, so what will the human perception of architecture rely on in an all-virtual world? I believe that the inevitable major trend in the future will be the conversion from physical sensing to emotional space, and this conversion will even be extreme and radical.[49] The human understanding of divinity, generated under primitive nature worship thousands of years ago and reflected in the architectural space, is perhaps the space that is eternal and does not change with the times.[50]

Recent advancements in metaverse technologies have dramatically improved the creation of emotionally engaging virtual spaces. Platforms like Decentraland (Figure 13) and VRChat (Figure 14) use cutting-edge VR and AR technologies to build immersive environments where users can create, explore, and interact in ways that go beyond physical limitations. These platforms foster shared emotional experiences and community engagement, providing a sense of presence and connection similar to real-world interactions. For example, virtual concerts (Figure 15) and art exhibits (Figure 16) in these spaces let people experience cultural events

45. Haraway, Donna. "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century." Simians, Cyborgs and Women: The Reinvention of Nature, Routledge, 1991, pp. 149-181.

46-47. Hayles, N. Katherine. How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics. University of Chicago Press, 1999.

48. "Please refine and rewrite the following text to make it sound more academic and professional" Prompt.
" OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

49. "Please refine and rewrite the following text to make it sound more academic and professional" Prompt.
" OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

50. Grosz, Elizabeth. Architecture from the outside: Essays on virtual and real space. MIT press, 2001.

together, creating unity and shared memories even when they're physically apart. This evolution shows the potential for the metaverse not just to preserve but also to enhance the emotional and social dimensions of architectural spaces in the digital age.[51]

Moreover, the addition of haptic feedback technology and sophisticated AI-driven interactions further deepens the immersive experience.[52] Haptic feedback allows users to 'feel' textures and movements, creating a more realistic and engaging environment. In virtual museums, for instance, users can 'touch' and 'feel' the texture of ancient artifacts or the brushstrokes on a painting, enhancing their connection to the exhibit. AI-driven characters and environments that respond to user actions and emotions create dynamic and personalized experiences, making each interaction unique and memorable.[53]

These advancements underscore the transformative potential of the metaverse in creating spaces that are not just functional but also emotionally and socially enriching.[54] By merging cutting-edge technologies with creative design, the metaverse is set to redefine how we interact with digital spaces, offering new possibilities for connection, learning, and healing.[55] As we continue to explore and expand these virtual worlds, the boundary between physical and digital experiences will become increasingly blurred, leading to a more integrated and enriched way of living.

51. Luo, Junliang, et al. "Unveiling social aggregation in the Decentraland metaverse platform." Proceedings of the 2023 ACM Conference on Information Technology for Social Good. 2023.

52. Bouzbib, Elodie, et al. ""can i touch this?": Survey of virtual reality interactions via haptic solutions: Revue de littérature des interactions en réalité virtuelle par le biais de solutions haptiques." Proceedings of the 32nd Conference on l'Interaction Homme-Machine. 2021.

53. Mark Purdy. "How the Metaverse Could Change Work" Harvard Business Review. April 05, 2022. https://hbr.org/2022/04/how-the-metaverse-could-change-work

54. "Please refine and rewrite the following text to make it sound more academic and professional" Prompt. " OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

55. Blascovich, Jim, and Jeremy Bailenson. Infinite Reality: Avatars, Eternal Life, New Worlds, and the Dawn of the Virtual Revolution. William Morrow, 2011.



Figure 12: Screenshot from Ghost in the Shell 2: Innocence by Oshii, Mamoru.
Toho Co., Ltd., DreamWorks Pictures, Madman Entertainment, 2004.



Figure 13: Decentraland
A 3D virtual world browser-based platform.
https://decentraland.org/



Figure 14: VRChat
an online virtual world platform created by Graham Gaylor and Jesse Joudrey
https://hello.vrchat.com/



Figure 15: An event inside the virtual, social world, Decentraland
by Decentraland
https://www.nftgators.com/metaverse-tech-company-terrazero-issues-one-of-the-first-mortgages-in-the-virtual-world/

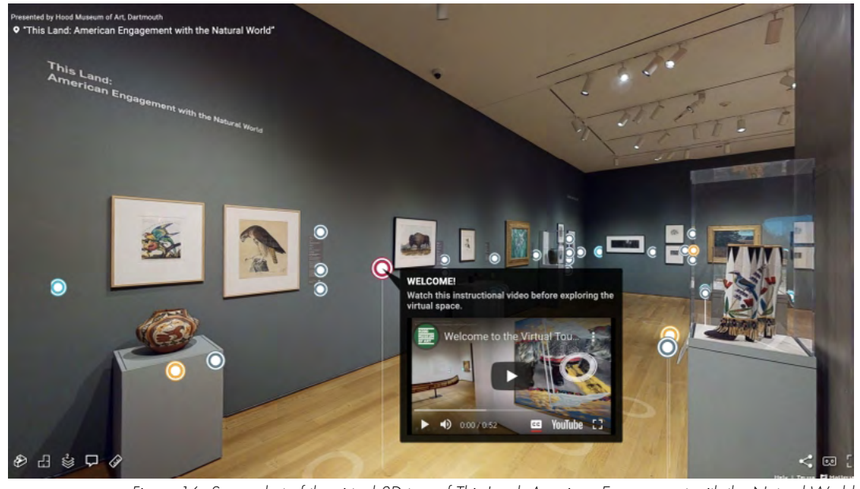


Figure 16: Screenshot of the virtual 3D tour of This Land: American Engagement with the Natural World
by Hood Museum
https://hoodmuseum.dartmouth.edu/news/2022/10/explore-hood-museum-exhibitions-through-3d-virtual-tours

VR House in Waterloo

In our daily lives, "home" is not just a place to live; it is also a sanctuary for emotions and memories. Every object and every corner holds unique memories and stories. Traditionally, these memories are often difficult to visually display and share. However, with the development of digital twins technology, we can explore, immerse in, and share these memory moments on a virtual platform.

This testing project aims to use Digital Twin[6] technology to model my house in Waterloo as an interactive, immersive "memory museum," showcasing the memories triggered by each setup in the house. Users will be able to explore and experience these memories in a virtual environment and share them with others. To provide an immersive experience, I will use virtual reality (VR) technology to create an environment where users can "walk into" the Digital Twin of the house and personally experience each memory-triggering moment. By using VR devices, Oculus Rift, users will be able to interact in an immersive virtual space. In the virtual model, I will add interactive points that users can click on to view visualized memory content, such as pictures, videos, and audio.

(6). A digital twin is a digital model of an intended or actual real-world physical product, system, or process that serves as the effectively indistinguishable digital counterpart of it for practical purposes, such as simulation, integration, testing, monitoring, and maintenance.
"What Is a Digital Twin?" IBM, https://www.ibm.com/topics/what-is-a-digital-twin.

Document of present

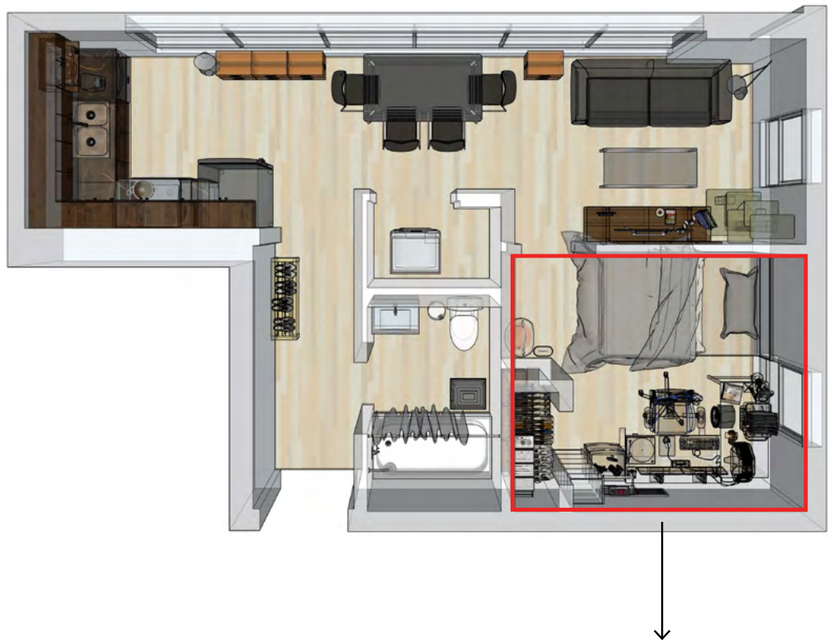




Figure 17: Plan of waterloo's house by Author





Figure 18: Axo of waterloo's house in Metaverse
by Author

ASSEMBLING MEMORIES

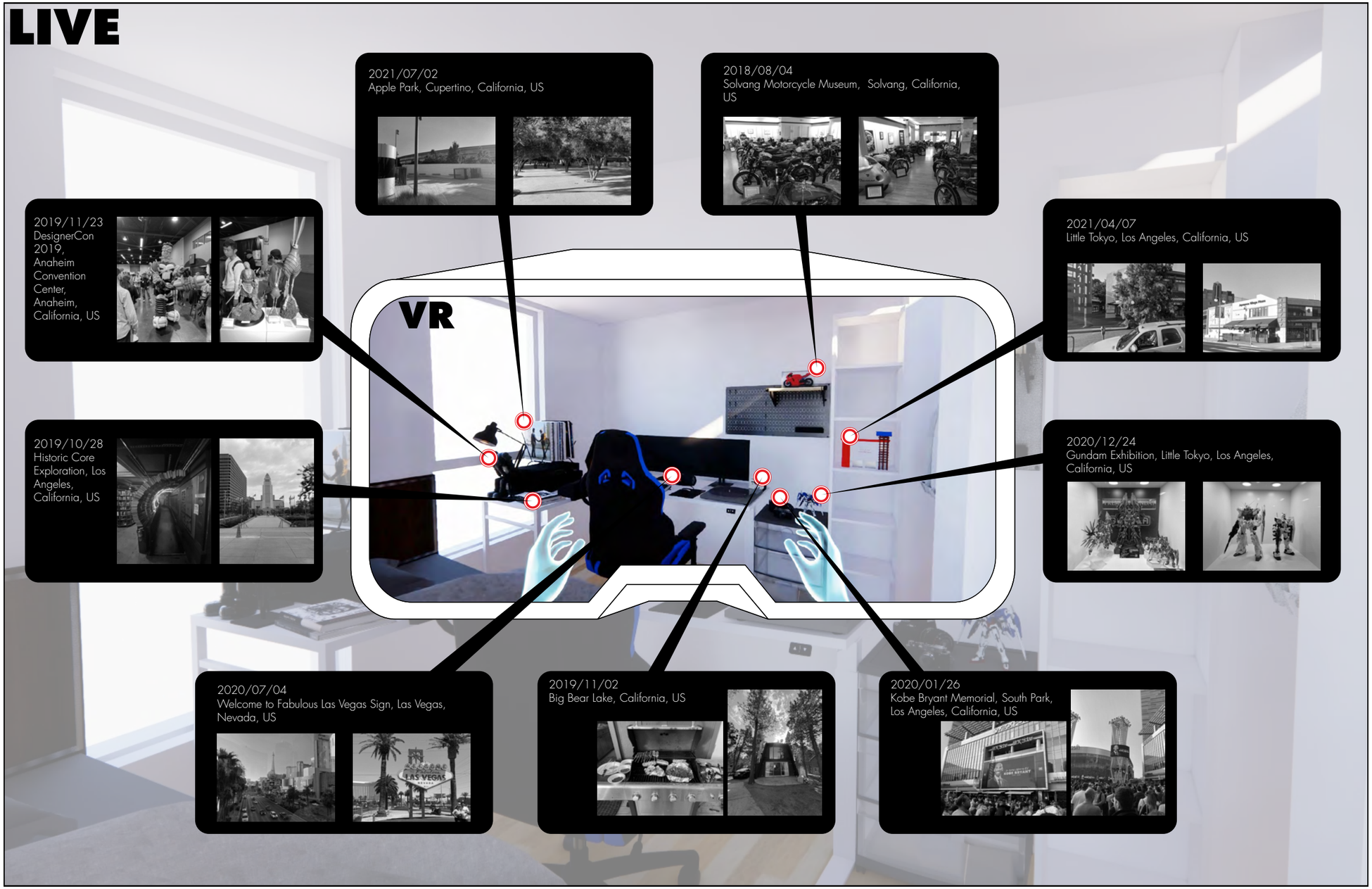


Figure 19: Digital Twin of Waterloo House by Author

Psychogeography and GIS

Freedom from artificial and perceived commodified society and the material world, enhancement of one's presence in the environment, and critical understanding of life and the world.

— Larissa Fassler



Figure 20: Smell Map of Edinburgh
The map provides a vivid interpretation of location-specific odors and how they move, with a multitude of different scents interwoven into a unique spatial experience
by Kate McLea
2011
http://sensorymaps.com/maps_cities/edi_smell.html

Psychogeography and GIS in Memory Recording

Psychogeography, introduced by the Situationist International[7], explores how geographical environments influence emotions and behaviors. This theory is crucial in architectural worldmaking in the metaverse, offering a framework to understand how virtual spaces can evoke emotional responses and shape memories. Integrating psychogeography with Geographic Information Systems (GIS) enhances this approach by providing tools to map and analyze these emotional landscapes in both physical and virtual spaces.[56]

Psychogeography examines the emotional and psychological effects of environments on individuals. Guy Debord described it as the study of the "specific effects of the geographical environment, consciously organized or not, on the emotions and behavior of individuals".[57] This theory helps understand how virtual environments can be designed to evoke strong emotional responses and create lasting memories.

Psychogeography emphasizes the importance of individuals' psychological experiences in urban spaces, their emotions, and behaviors. It also aims to uncover and highlight forgotten or marginalized architectural landscapes, emphasizing the significance of human subjective will in shaping the city.[58]

Geographic Information Systems (GIS)[8] provide powerful tools for mapping and analyzing the impact of environments on humans. By integrating psychogeography with GIS, we can create detailed maps that reflect how different urban elements affect human behavior and memory. GIS allows for the collection, analysis, and visualization of spatial data,

56. Wheatley, David, and Mark Gillings. "Spatial Technology and Archaeology: The Archaeological Applications of GIS." CRC Press, 2002.

57. Debord, Guy. "Introduction to a Critique of Urban Geography." Situationist International Anthology, edited by Ken Knabb, Bureau of Public Secrets, 2006.

58. "the role of psychogeography in urban space" prompt.
OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

(7). Situationist International : The Situationist International (SI) was an international organization of social revolutionaries made up of avant-garde artists, intellectuals, and political theorists.

(8). GIS: GIS is a technology that is used to create, manage, analyze, and map all types of data. GIS connects data to a map, integrating location data.
https://www.esri.com/en-us/what-is-gis/overview

which can be overlaid with psychogeographic information to create a comprehensive understanding of urban spaces.[59]

Psychogeography encourages "drifting" (dérive) as a way to "get lost" in the city without a planned agenda, fully absorbing the city's information—the art of wandering.[32] During these urban explorations, one engages with the environment through all senses, capturing visual images, smells, sounds, mood changes, thoughts, and concepts. This complex data is then mapped and analyzed, helping to rediscover the city's spirit.[61]

In the physical world, psychogeography involves exploring urban spaces to uncover the hidden influences of the environment on human emotions and behaviors. Techniques like the dérive involve unplanned, immersive explorations of the city, revealing how urban elements like paths, edges, districts, nodes, and landmarks (Lynch) contribute to the legibility and emotional resonance of urban spaces.[61]

In the metaverse, digital environments can replicate or enhance the emotional and psychological impacts of physical spaces. By applying psychogeographic principles and using GIS, virtual spaces can be designed to evoke desired emotional responses.[63] This process involves manipulating spatial elements in virtual environments to facilitate memory encoding and retrieval, emphasizing subjective experiences.[64]

While both physical and virtual psychogeography aim to uncover and influence emotional responses to environments, they differ in their mediums and methods. Physical psychogeography relies on real-world explora-

59. Buendía, Amalia Vaneska Palacio, Yolanda Pérez-Albert, and David Serrano Giné. "Mapping Landscape Perception: An Assessment with Public Participation Geographic Information Systems and Spatial Analysis Techniques." Land, vol. 10, no. 6, 2021, pp. 632. MDPI, https://doi.org/10.3390/land10060632.

60. Debord, Guy. "Theory of the Dérive." Situationist International Anthology, edited by Ken Knabb, Bureau of Public Secrets, 2006, pp. 62–66.

61. Coverley, Merlin. Psychogeography. Oldcastle Books, 2010.

62. "Please refine and rewrite the following text to make it sound more academic and professional" Prompt. " OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

63. Chang, Kang-tsung. Introduction to Geographic Information Systems. 9th ed., McGraw-Hill, 2018.

64. "Expand the contents" prompt. "OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

tion and sensory experiences, often using the concept of dérive to foster unplanned, immersive interactions with the city. Virtual psychogeography, on the other hand, leverages digital technologies to create simulated environments that can be manipulated to evoke specific emotions and memories.[65] In virtual spaces, designers have greater control over environmental variables, allowing for the creation of highly tailored experiences that might not be possible in the physical world.[66 67]

Integrating GIS into virtual spaces bridges the gap between digital and physical environments. For example, Augmented Reality (AR) applications can overlay virtual elements onto physical spaces, combining real-world exploration with digital enhancements. In this regard, Pokemon Go (Figure 21) is a popular case study. Similarly, the StreetMuseum app (Figure 22), developed by the Museum of London, uses AR technology to overlay historical photos and information onto modern streets.

Psychogeography and GIS offer valuable insights for designing virtual environments that facilitate memory recording and sharing. By considering the emotional and psychological impacts of digital spaces, architects and designers can create immersive environments in the metaverse that enhance user experience and contribute to collective memory formation.[68] Integrating these approaches into architectural worldmaking enriches the design process, offering new possibilities for creating meaningful, engaging, and emotionally resonant virtual spaces.[69]

65. Farman, Jason. Mobile Interface Theory: Embodied Space and Locative Media. Routledge, 2012.

66. Wan, Jiangjun, Xinyue Zhang, and Jinghui Li. "Emotional Landscapes in Urban Design: Analyzing Color Emotional Responses of the Elderly to Community Outdoor Spaces in Yi Jie Qu." Buildings, vol. 14, no. 3, 2024, pp. 793. MDPI, https://doi.org/10.3390/buildings14030793.

67. Buendía, Amalia Vaneska Palacio, Yolanda Pérez-Albert, and David Serrano Giné. "Mapping Landscape Perception: An Assessment with Public Participation Geographic Information Systems and Spatial Analysis Techniques." Land, vol. 10, no. 6, 2021, pp. 632. MDPI, https://doi.org/10.3390/land10060632.

68. Kitchin, Rob, and Martin Dodge. Code/Space: Software and Everyday Life. MIT Press, 2011.

69. Wheatley, David, and Mark Gillings. "Spatial Technology and Archaeology: The Archaeological Applications of GIS." CRC Press, 2002.



Figure 21: Pokemon Go
augmented reality app created by Niantic, Inc.
https://pokemongolive.com/



Figure 22: Streetmuseum
augmented reality app created by The Museum of London

Architectural Worldmaking

A world we engaging via a perspective of architects

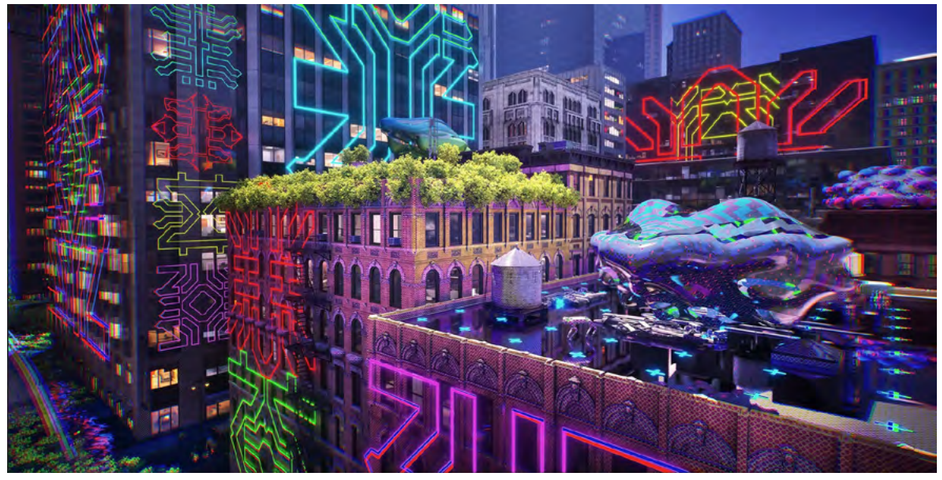


Figure 23: Discovery
The story of Discovery deals with an ecological simulation of downtown Los Angeles of the near future creating a digtal world upon the physical world.
Project by Damian& Lidija Kljakovic
https://lifeforms.io/DISCOVERY

Architectural Worldmaking

Architectural worldmaking explores the ability of architecture to create immersive, emotionally resonant environments that go beyond the physical limitations of traditional built spaces.[70] These environments integrate storytelling, interactive technologies, and experiential design, offering spaces that foster a deeper personal and collective connection between users and their surroundings.[71] This thesis focuses on one of the key techniques of architectural worldmaking—collage—which plays a significant role in constructing these engaging environments. Collage allows for the assembly of fragmented elements—be they physical structures or digital representations—into cohesive, layered compositions, reflecting the complexity of memory and perception in both the virtual and physical worlds.

Nelson Goodman's theory in "Ways of Worldmaking" discusses how we construct multiple worlds through various symbolic systems.1 Goodman emphasizes that worldmaking involves a series of processes such as composition, decomposition, and reconstruction, which can be applied to both physical and virtual spaces. In the context of architectural worldmaking, these processes enable the creation of environments that are not only physically engaging but also rich in symbolic meaning. By using elements of narrative, interactivity, and sensory experiences, architects can construct virtual worlds that resonate deeply with users, fostering a sense of presence and emotional connection.[73]

An exemplary historical reference for the concept of architectural worldmaking is Giovanni Battista Piranesi's "Plan of Campo Marzio" from Il Campo Marzio dell'antica Roma, published in 1762 (Figure 24). Piranesi's work is a unique blend of meticulous historical documentation and imaginative reconstruction. This project captures both the actual ruins and speculative architectural elements, infused with Piranesi's visionary style.

70. "Please introduce architectural worldmaking" Prompt.
" OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

72. "Please introduce architectural worldmaking" Prompt.
" OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

73. Goodman, Nelson. Ways of Worldmaking. Hackett Publishing, 1978.

His plan not only maps the ruins and layout of ancient Rome's Campus Martius but also brings in elements of creative collage, juxtaposing fragments of real and imagined architecture. This method of combining multiple architectural perspectives mirrors the collage technique, wherein fragmented components are assembled to form a cohesive whole. It highlights how architecture can evoke powerful historical and cultural memories by layering and reinterpreting elements of the past.[74]

Similarly, Sam Jacob's "Empire of Ice Cream" exemplifies this collage methodology in the realm of contemporary architectural worldmaking (Figure 25). Jacob's series of drawings combines fragments of architectural plans, blending grand monumental forms with the mundane. These elements, sourced from historical and contemporary contexts, are depicted in a fragmented, layered manner, creating an architectural landscape that is complex, hybrid, and perpetually evolving.[75]

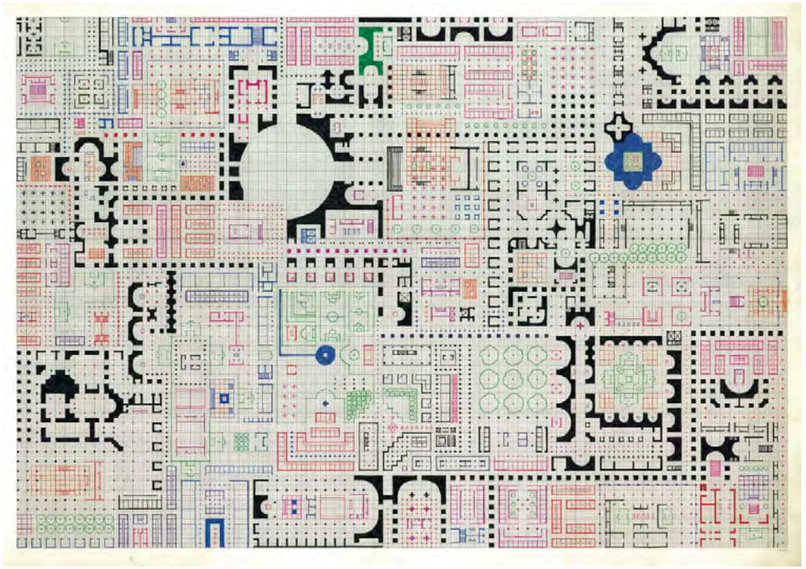
In the digital age, this collage method can be extended into the metaverse. Just as Piranesi and Jacob used collage to construct complex, layered architectural worlds, the "Assembling Memories" framework leverages modern technologies to allow users to experience and shape shared cultural memories in dynamic, participatory ways.

74. Maier, Jessica. "Rome Lost and Found: A Review of Piranesi and the Campus Martius: The Missing Corso – Topography and Archaeology in Eighteenth-Century Rome/Piranesi e il Campo Marzio: Il corso che non c'era – Topografia e archeologia nella Roma del XVIII secolo." Architectural Histories, 7 May 2021, https://journal.eahn.org/article/id/9466/.

75. Jacob, Sam. "Empire of Ice Cream." Sam Jacob Studio, https://www.samjacob.com/portfolio/empire-oficecream/.



Figure 24: Large plan of the Roman Campo Marzio (Field of Mars) in Rome
Created by Giovanni Battista Piranesi
Photo by Dietmar Katz
Kunstbibliothek, Staatliche Museen zu Berlin - Preußischer Kulturbesitz



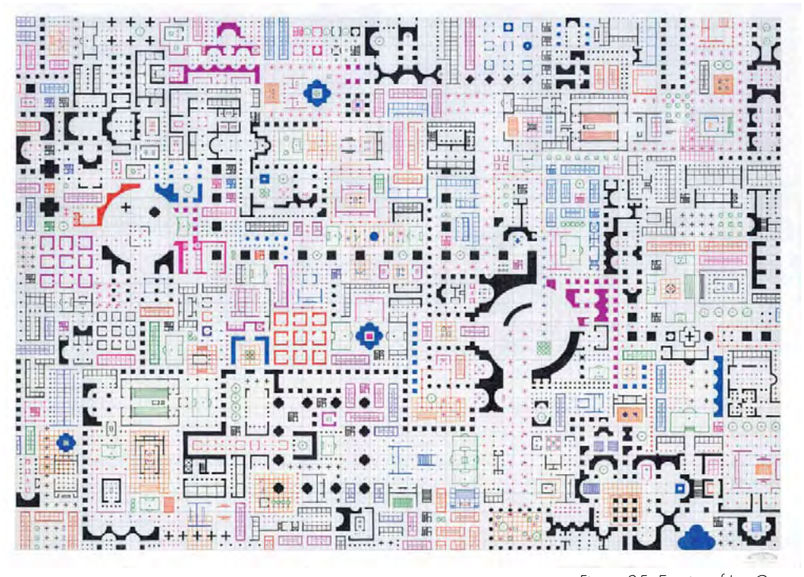


Figure 25: Empire of Ice Cream
by Sam Jacob
https://www.samjacob.com/portfolio/empireoficecream/

Place Immersion

A sense of presence, enhancing memory recall and engagement within that space.[76]

76. Buttazzoni, Adrian, et al. "Toward conceptualizing "place immersion" as a spatial neuropsychosocial phenomenon: A multidisciplinary meta-review and-synthesis." Journal of Environmental Psychology 81 (2022): 101810.



Figure 26: VAN GOGH – Distorsion
A walkable immersive experience entirely designed in Montreal.
Project by OASIS immersion
https://fontemotion.com/project_list/van-gogh-distorsion/

The Role of Place Immersion in Assembling Memories

Place immersion refers to the deep, engrossing, and effortless engagement individuals have with their environments. This experience stems from multiple inputs, including precognitive processes (neuro-spatial), embodied cognition (psycho-spatial), and socio-cultural framing (socio-spatial) (Figure 27).[77] In this context, we argue that place immersion serves as a bridge between the physical and virtual realms, allowing memories to be deeply tied to spatial experiences in both worlds.

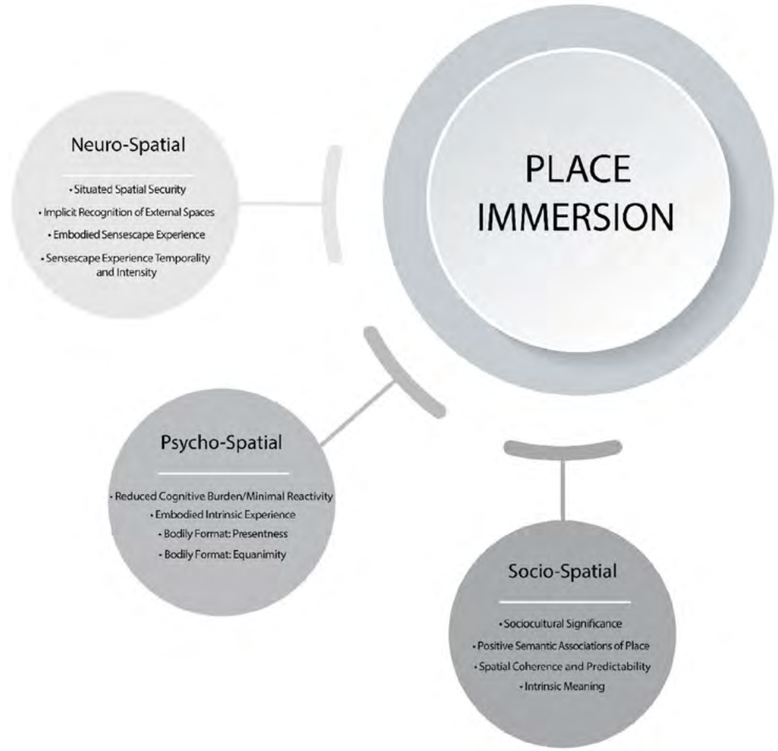


Figure 27: Visual Concept of "Place Immersion"
A visual overview of place immersion as a spatially-based neuropsychosocial concept
"Toward conceptualizing "place immersion" as a spatial neuropsychosocial phenomenon *Figure 2*

77. Buttazzoni, Adrian, et al. "Toward conceptualizing "place immersion" as a spatial neuropsychosocial phenomenon: A multidisciplinary meta-review and-synthesis." Journal of Environmental Psychology 81 (2022): 101810.

In the context of place immersion, the integration of memory, architecture, and virtual worlds presents an intriguing shift from traditional memory preservation methods to those enabled by modern digital technologies. Traditionally, memory has been tied to physical structures such as monuments, buildings, and landscapes, serving as anchors for cultural narratives and personal memory. However, the advent of virtual environments provides a new frontier for preserving and sharing memories, particularly when examined through the lens of place immersion. In the Metaverse, architectural components, such as virtual "columns" or "windows," can serve as powerful triggers for memory recall, much like their physical counterparts. These virtual elements, as part of an immersive experience, allow users to form deep, emotional connections with digital spaces, echoing the sensory and cognitive engagement found in real-world environments.

Incorporating psychogeography into virtual space design allows these environments to influence users' emotions and behaviors, as geographic locations traditionally do. The use of Geographic Information Systems (GIS) within these digital worlds extends the immersive experience by mapping memories onto specific locations in both virtual and real-world spaces. As users explore these digitally enhanced spaces, they engage in place immersion, recording and sharing personal memories that blend seamlessly into a larger collective narrative, merging the boundaries between the physical and virtual worlds.

Architectural worldmaking, an essential concept in this thesis, reflects the dynamic nature of memory curation in these digital spaces. Through augmented reality (AR) and virtual reality (VR), users actively participate in creating and reshaping their memory worlds. Unlike traditional static ar-

chitecture, this process is participatory and fluid, allowing for a dynamic rearrangement of architectural elements that reflect personal and collective memories. As a result, a new typology of architecture emerges—one that transcends physical constraints and fosters an inclusive environment where memories can be expressed and shared freely.

The collective aspect of this memory construction is further explored through dynamic urban exploration, where users engage with virtual spaces similarly to how they navigate the real world. Platforms like Pokémon Go demonstrate how augmented reality can encourage users to explore urban environments in new ways, creating shared experiences that contribute to collective memory. This thesis envisions a similar approach, where users collaborate in building virtual structures that reflect their memories, transforming these spaces into living archives that evolve as more users contribute their experiences.

In summary, by bridging the gap between digital and physical environments, these immersive spaces not only serve as repositories of memories but also as dynamic platforms where personal and collective memories are continuously shaped and shared. This synthesis of memory, architecture, and place immersion redefines how we experience, preserve, and interact with our environments, providing a framework for understanding the role of memory in both physical and virtual spaces.[77]

77. "Please refine and rewrite the following text to make it sound more academic and professional with a focus on advancing my understanding of place immersion which would be my final goal" Prompt.
" OpenAI. "ChatGPT." ChatGPT Pro, chatgpt.pro/, Jan 15, 2025.

Case Study: Reddit's r/place

Introduction

Reddit's r/place is a unique social experiment and collaborative art project that highlights the intersection of community, memory, and digital space. First launched on April Fool's Day 2017, and repeated in subsequent years, r/place provided a massive online canvas where users could place one pixel every five minutes. This experiment resulted in a constantly evolving mosaic of user-generated artwork, illustrating the power of collective memory and collaborative design in a digital environment.

Concept and Implementation

The concept behind r/place is simple yet powerful: a large, shared canvas where users can place a single colored pixel at intervals, contributing to an evolving and often chaotic art piece. This collaborative effort not only required individual creativity but also strategic coordination among users to create and maintain complex images amidst potential interference from others.

Technically, the canvas data was managed using a 4-bit bitfield on the backend, where each color was represented by a number between 0 and 15, allowing efficient storage and manipulation of pixel data. The canvas state was frequently updated and shared with users via an API, ensuring that everyone worked on the most current version of the artwork.

Collaborative Design

The project illustrates a form of collaborative design. Users often formed alliances, coordinated through social media platforms like Reddit, Twitch, and Discord, to create and defend their contributions on the canvas. This aspect of r/place highlights the dynamics of collective memory and cooperative creation in digital spaces, demonstrating how virtual environments can facilitate community-driven art and storytelling.

Community Engagement and Memory Formation

The interactions on r/place are not just about placing pixels but about community engagement and memory formation. The project became a battleground for cultural symbols, memes, and national flags, with users rallying to support or oppose various images. These collective efforts created a living digital tapestry that encapsulated the community's values, humor, and conflicts at the time of its creation.

Through this participatory process, r/place serves as a digital memory repository. The final canvas captures a snapshot of the internet's collaborative spirit, reflecting the diverse contributions and the ephemeral nature of digital interactions.

Applications in the Metaverse

The success of r/place demonstrates the potential for similar collaborative and memory-driven projects in the metaverse. By leveraging AR and VR technologies, architects and designers can create virtual environments that foster community engagement and collective memory. These digital spaces can serve as platforms for shared creative expression, historical preservation, and cultural storytelling, bridging the gap between the digital and physical worlds.

Conclusion

Reddit's r/place is a compelling example of how digital platforms can facilitate collaborative art and collective memory. Through the simple act of placing pixels, users engage in a complex interplay of creativity, strategy, and community, resulting in a dynamic and ever-changing artwork. The principles of psychogeography and collaborative design evident in

r/place offer valuable insights for developing immersive and interactive virtual environments in the metaverse.[78] [79] [80]

78. "Latent Structure in Collaboration: The Case of Reddit r/place." AAAI, 2018. AAAI

79. "How We Built r/Place." Upvoted by Reddit, 2017. Upvoted

80. "How Reddit's r/place Brought The Internet Together For Four Glorious Days." Know Your Meme, 2023.

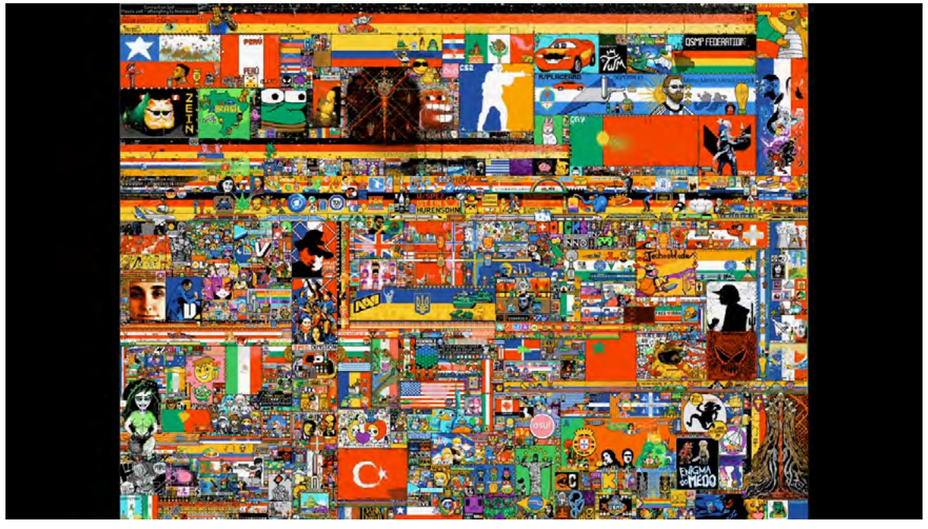


Figure 28: Screenshoot from "Official r/place 2023 canvas timelapse" by Reddit on YouTube https://www.youtube.com/watch?v=xjOMPka5WFo

Case Study: Pokémon Go

Introduction

Pokémon Go, launched in July 2016 by Niantic Labs, is a location-based augmented reality (AR) mobile game that has revolutionized the way people interact with both the digital and physical worlds. By blending real-world locations with virtual gameplay, Pokémon Go provides an innovative platform that integrates AR and geolocation technologies. This case study explores the impact of Pokémon Go on memory recording, urban exploration, and collective participation, aligning with the themes of this thesis on using the metaverse for memory preservation and urban design.

Augmented Reality (AR) and Geolocation

Pokémon Go leverages AR to superimpose virtual Pokémon characters onto real-world environments, visible through a smartphone's camera view. This technology enhances the gaming experience by making it more immersive and interactive. Players navigate their physical surroundings to find and capture Pokémon, visit Pokéstops (real-world landmarks), and battle at virtual gyms located at significant points of interest. The use of geolocation technology allows the game to create a dynamic map of the player's environment, encouraging exploration and interaction with real-world spaces (Wharton).

AR in Pokémon Go serves several functions:

- Enhanced User Engagement: The integration of AR makes the game more engaging by combining physical activity with virtual rewards.
- Spatial Awareness: Players develop a better understanding of their surroundings as they navigate to various locations to find Pokémon.
- Social Interaction: The game's design promotes social interaction,

as players often meet and collaborate at popular Pokéstops and gyms (Bain & Company).

Psychogeography and Memory Recording

Psychogeography examines the influence of geographical environments on individuals' emotions and behaviors. In the context of Pokémon Go, the game's design encourages players to explore urban environments in new ways, uncovering hidden aspects of their cities and experiencing familiar places from different perspectives. This aligns with the principles of psychogeography, which emphasize the importance of subjective experiences in understanding urban spaces.

Pokémon Go enhances memory recording by creating strong associations between specific locations and in-game experiences. For example, a player might remember capturing a rare Pokémon at a particular park or winning a battle at a local landmark. These experiences become part of the player's personal memory, enriched by the emotional and social interactions facilitated by the game.

Collective Participation and Urban Exploration

One of the significant impacts of Pokémon Go is its ability to foster collective participation. The game's design encourages players to gather at specific locations, creating spontaneous social events and a sense of community. This collective participation is crucial for transforming personal experiences into collective memories, as players share their stories and experiences with each other.

The game also influences urban exploration by encouraging players to visit new places and engage with their environment in novel ways. This aspect of Pokémon Go aligns with the concept of the dérive, a psycho-

geographic practice of drifting through urban spaces to discover their hidden dynamics and emotional landscapes. By integrating this practice into its gameplay, Pokémon Go helps players reconnect with their surroundings and fosters a deeper appreciation of their urban environment.

Conclusion

Pokémon Go serves as a powerful example of how AR and geolocation technologies can be used to enhance memory recording and urban exploration. By blending virtual gameplay with real-world interaction, the game creates a unique platform for collective participation and memory preservation. This case study demonstrates the potential of integrating psychogeographic principles and AR technologies into the design of virtual environments, offering valuable insights for the thesis on "Assembling Memories." [81] [82]

81. Journal of Medical Internet Research - Influence of Pokémon GO on Physical Activity and Psychosocial Well-Being in Children and Adolescents: Systematic Review. www.jmir.org

82. Diggit Magazine - How Pokemon Go shapes our lives. www.diggitmagazine.com

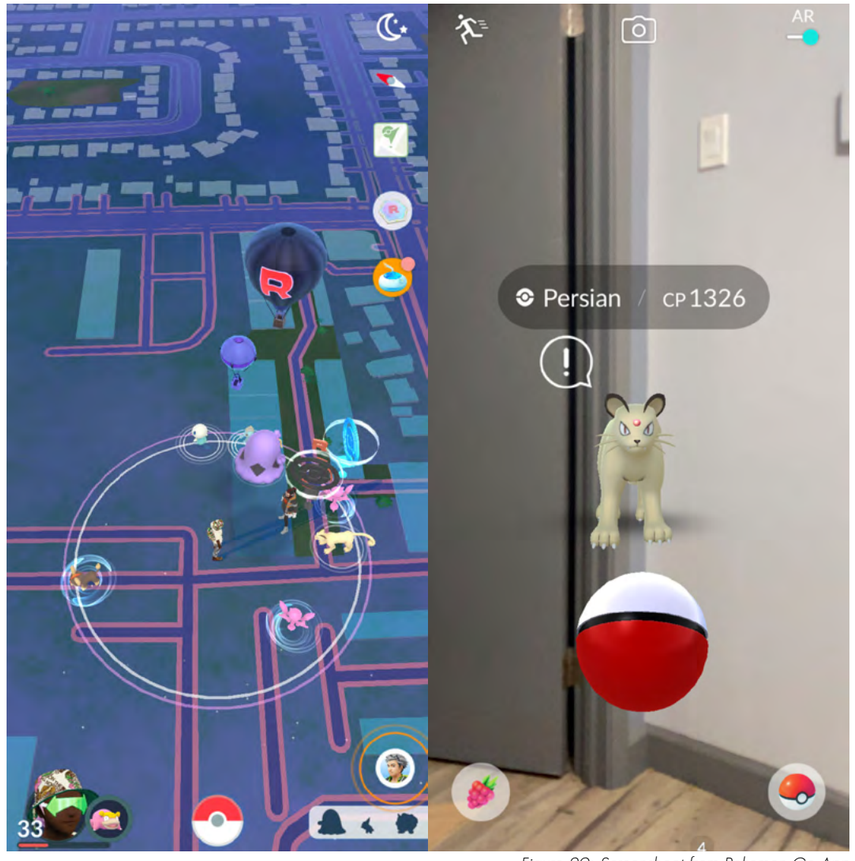


Figure 29: Screenshoot from Pokemon Go App by Author

Case Study: [murmur]

Introduction

[murmur] is a documentary oral history project that captures and shares stories tied to specific locations. This initiative focuses on collecting personal histories and anecdotes about places in neighborhoods that hold significant meaning to individuals. It was initially launched in Toronto's Kensington Market in 2003 and has since expanded to other cities, including Vancouver, Montreal, Calgary, and San Jose.

Project Description

The essence of [murmur] lies in its innovative approach to blending personal memory with geographic locations. At various significant spots within a neighborhood, [murmur] places signs featuring a telephone number. When individuals call this number, they can listen to stories related to that exact spot, enhancing their experience by standing where the narrative unfolded. This method allows for an immersive, place-based storytelling experience, creating a deep connection between the listener and the physical environment.

Implementation and Expansion

Participants in the [murmur] project contribute stories that range from personal recollections to historical accounts, all told from a personal viewpoint. This ground-up approach to history emphasizes voices often overlooked in traditional narratives, focusing on the intimate, everyday experiences that shape a city's identity. The stories are available on the [murmur] website but truly come to life when experienced on-site, transforming seemingly mundane locations into vibrant memory landscapes.

Impact on Urban Experience

[murmur] enriches the urban experience by encouraging people to explore their cities through the lens of personal narratives. This approach

brings history to life, making it more relatable and engaging. It also underscores the importance of the physical environment in shaping and preserving memories, fostering a sense of community and shared heritage.

Psychogeography and [murmur]

Psychogeography, which examines the emotional and psychological impacts of geographical environments on individuals, aligns closely with [murmur]'s objectives. By encouraging people to wander and discover hidden stories within their urban surroundings, [murmur] taps into the core principles of psychogeography. This exploration helps individuals develop a deeper understanding and appreciation of their city's history and cultural fabric.

Conclusion

The [murmur] project exemplifies how integrating personal memories with specific locations can enhance the urban experience. By leveraging the principles of psychogeography, [murmur] not only preserves valuable personal and collective histories but also transforms the way people perceive and interact with their environments. This approach highlights the potential for using similar methodologies in digital and virtual spaces, fostering a deeper emotional connection to both physical and virtual worlds.[49] [50]

83. Bonacini, E. "Stories on geographies: Geo-social tagging for co-creation of cultural value." International Journal of Heritage in the Digital Era 2.2 (2013): 221-243.

84. [murmur], https://cfccreates.com/content-hub/murmur/

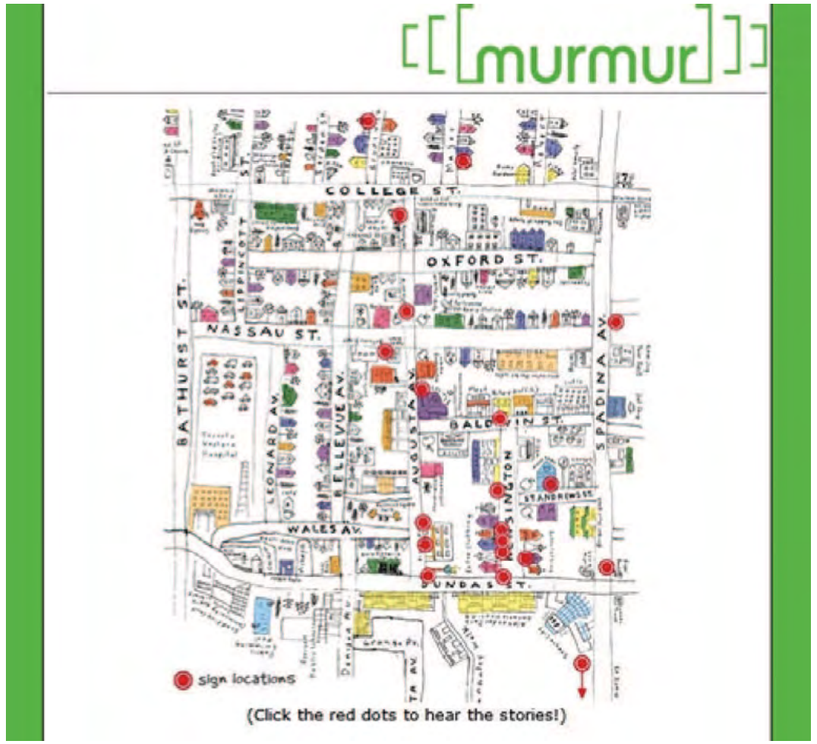


Figure 30: [Murmur] - Kensigton Market in Toronto
[murmur], https://cfccreates.com/content-hub/murmur/



Figure 31: [Murmur] Sign on Street
[murmur], https://cfccreates.com/content-hub/murmur/

Final Objective

The proposed platform embraces place immersion, a concept that allows users to engage deeply with both physical and virtual environments, merging these realms to create a seamless experience. This fusion transforms memory interaction by placing users in immersive memory spaces that transcend the limitations of traditional architecture. Users can explore memories as living, interactive environments, fostering deeper connections to both individual and collective recollections.

Within this platform, users express their recorded memories, captured via TikTok in specific locations, as organic architectural forms. These memory representations take on flexible and evolving characteristics, much like the organic, non-linear nature of memory itself. Users can select one or more architectural components that best reflect their memories of a place, forming a collage that integrates personal and collective experiences.

In the "construction zone," users engage in a participatory, augmented reality-based experience where they collaborate to construct virtual buildings and landscapes. This interaction is key to place immersion—users are not passive observers but active participants shaping their surroundings. As they build together, their collective memories grow and form new urban structures that exist both within the virtual memory world and reflect their physical environments.

The design framework for "Assembling Memories" is a detailed and holistic approach that merges various theoretical foundations to turn personal memories into collective architectural elements within the metaverse. This framework is organized into two main phases: **Personal Memory Recording** and **Assembling Memories** (Figure 32).

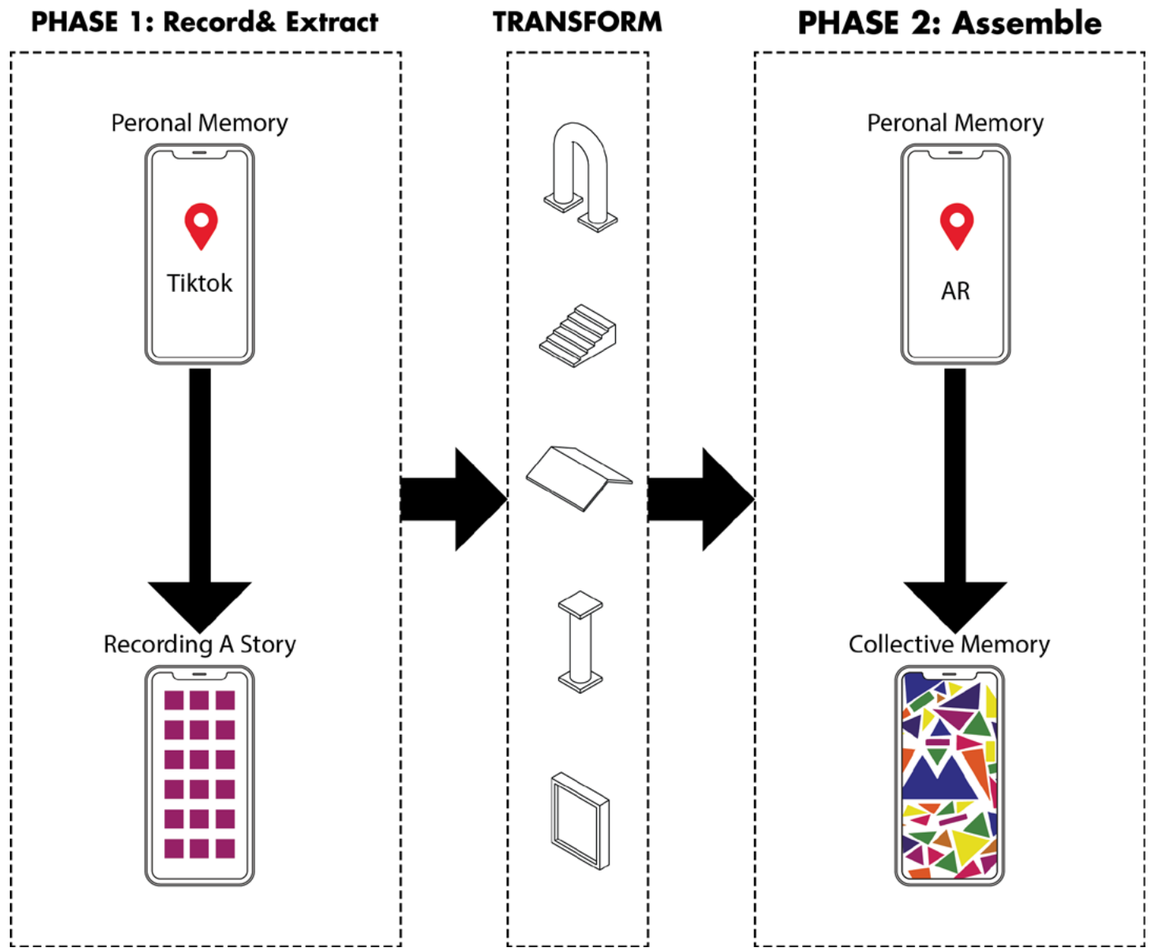


Figure 32: Concept Framework Diagram by Author

Phase 1: Personal Memory Recording

The first phase, Personal Memory Recording, focuses on capturing and mapping personal memories associated with specific locations using TikTok. This phase begins with the systematic collection of data where TikTok serves as the primary source. Users share videos that document their interactions with urban environments, providing unique personal perspectives and memories tied to specific buildings, streets, or landscapes. These videos act as digital representations of urban spaces and personal experiences.

Once videos are collected, they are tagged and analyzed based on user location, primary and secondary subjects, and relevant keywords to identify key elements and features highlighted in each recording. This process can be efficiently achieved through AI learning. This involves extracting spatial and material characteristics such as architectural details, atmospheric elements, or notable landmarks from the videos. By employing Geographic Information Systems (GIS), these characteristics are mapped to create a visual representation of memory hotspots of interest within a specific region.

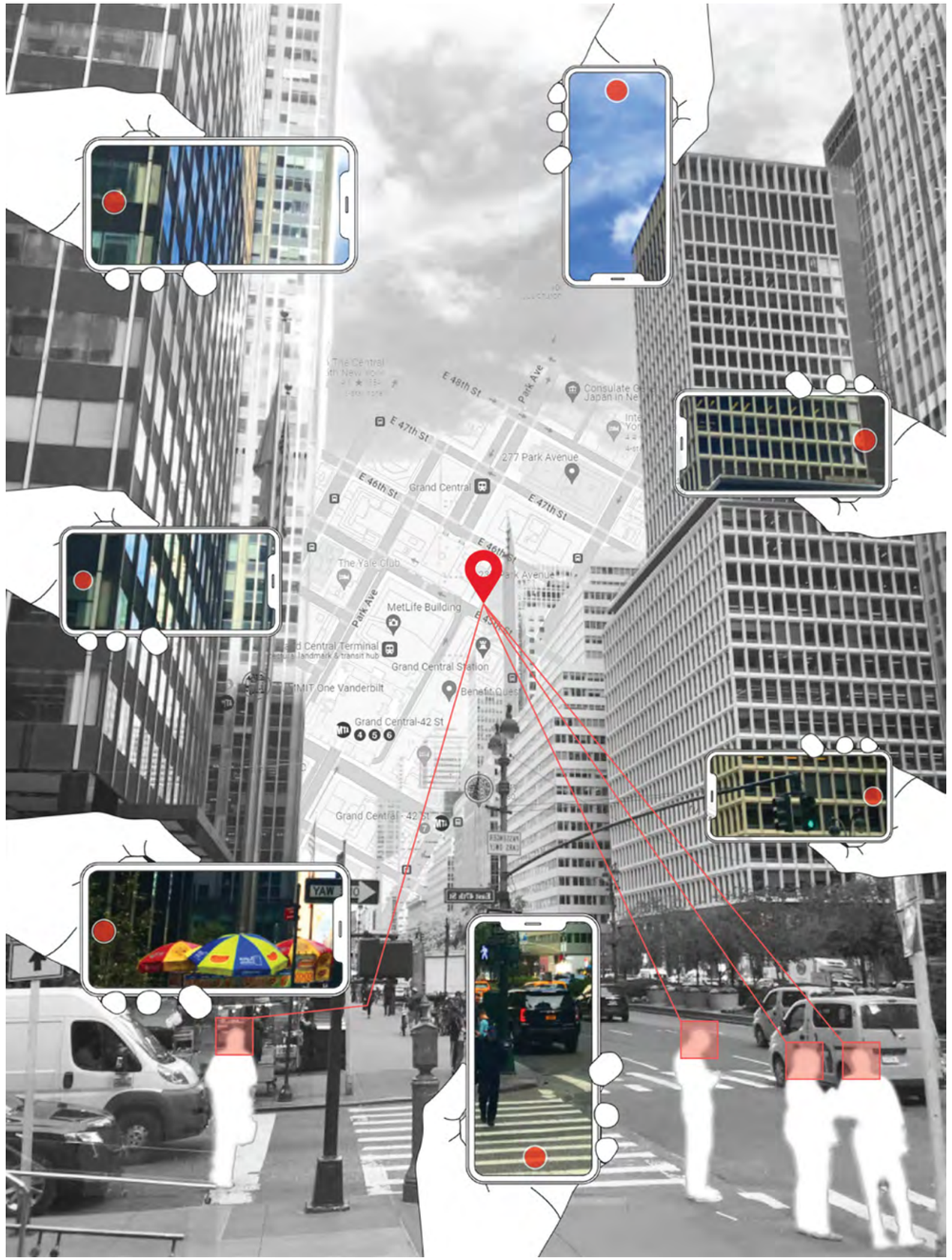


Figure 33: Phase 1 Diagram by Author

Phase 2: Assembling Memories

The second phase, Assembling Memories, involves linking the abstracted architectural elements to collective memory through collaborative design processes. Central to this phase is architectural worldmaking, which uses collage techniques to assemble fragmented personal memories into a unified, immersive environment. This collage approach allows individual memories to retain their distinctiveness while contributing to a cohesive whole.

By leveraging mobile devices, AR, and metaverse platforms, users can interact with and manipulate these digital architectural components. This participatory design fosters public engagement, giving users a sense of ownership over the final creation. Collage plays a key role here, as memories are layered and combined, creating rich, multi-dimensional spaces that reflect both personal and collective narratives.

The final result is a memory world that serves not merely as an archive but as an interactive platform, enabling users to engage with urban spaces through the collective lens of shared memories. This process departs from traditional monument-building by emphasizing public collaboration and dynamic participation, creating an evolving memory landscape that bridges the physical and digital worlds.

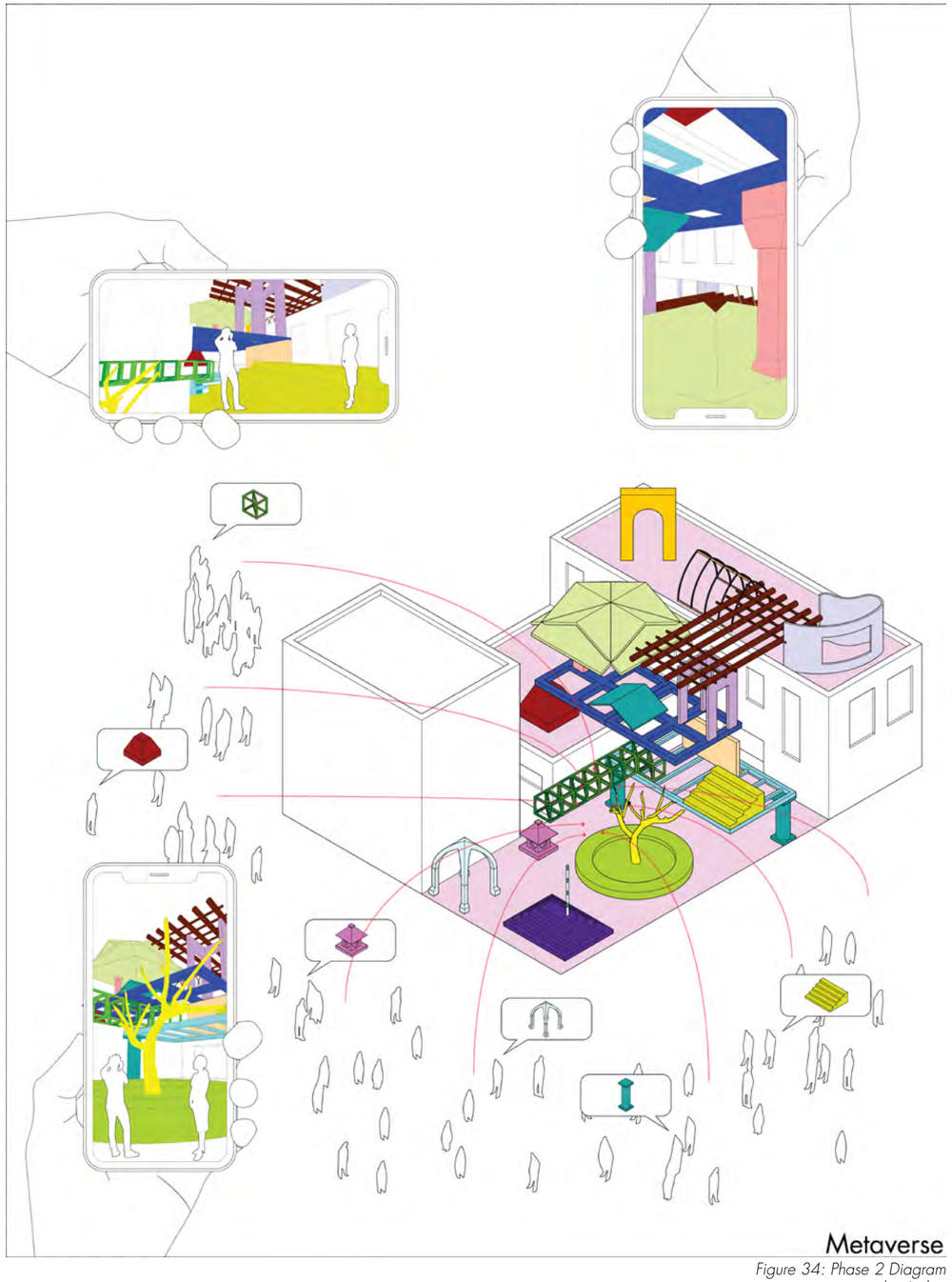


Figure 34: Phase 2 Diagram by Author

User Experience of the Platform

The platform offers an immersive and interactive way for users, whether tourists or residents, to record, share, and co-create collective memories tied to specific urban locations. It operates as a layered digital ecosystem, blending geolocation, social media integration, AR technology, and participatory design.(Figure 35)

1. Discovering the Platform
    - Hotspot Map Navigation: Users begin by accessing a dynamic, geolocated hotspot map that highlights areas of significant cultural, historical, or personal interest within a broader urban region.
    - Physical Access Points: Upon arriving at a hotspot, users encounter QR codes, signage, or digital markers strategically placed at key locations. Scanning the QR code or tapping the marker enables users to join the platform seamlessly.

2. Contributing Personal Memories
    - Tapping Into TikTok: Users record videos through TikTok, capturing their unique interactions with the hotspot's urban environment. These recordings encapsulate their personal experiences, showcasing details such as buildings, streets, local food, or cultural elements.
    - Memory Highlight Selection: After posting their TikTok video, users are prompted by the platform to select specific visual or narrative features from the post that they believe best represent their memory of the hotspot.

3. Transforming Memories into Architectural Elements
    - Memory to Architecture: The selected features from the TikTok video are analyzed and abstracted by the platform's AI system, converting them into modular architectural components. Examples include:
        - A striking façade detail becoming a customizable "wall element."
        - A landmark building outline translating into a "structural frame."
        - Local artifacts or textures forming "ornamental tiles" or "interactive sculptures."
    - Interactive Preview: Users can visualize these architectural components in augmented reality (AR), experimenting with how their memory integrates into the existing digital hotspot structure.

4. Collaborative Assembly in AR
    - AR Integration: Using the platform's AR functionality, users can position, rotate, and combine their memory-based architectural components with those contributed by others. The AR interface allows for intuitive manipulation within the hotspot's spatial environment.
    - Collaborative Building: As users interact, the memory world evolves organically, with components layered and rearranged dynamically. This process mirrors how cities grow and adapt through collective inputs.

5. Exploring and Engaging with the Memory World
    - Personal Reflection and Public Exploration: Users can revisit the memory world at any time, experiencing how their contribution blends with others to form a cohesive yet ever-changing narrative of the hotspot.
    - Tour and Immersion: The platform serves as both a guide and a living archive, enabling users to explore hotspots through others' memories. The experience fosters a sense of connection to the city, its history, and its collective identity.

6. Incentivizing Continuous Engagement
   - Personalized Notifications: Users are updated as new components are added to the memory world, encouraging them to revisit and contribute further.
   - Community Recognition: Contributions are credited to users, building a community-driven network of shared urban memories.

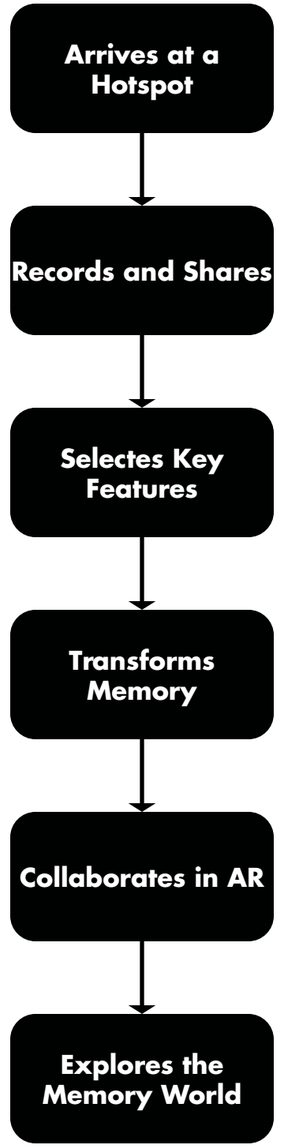


Figure 35: User Experience Diagram by Author

ASSEMBLING MEMORIES

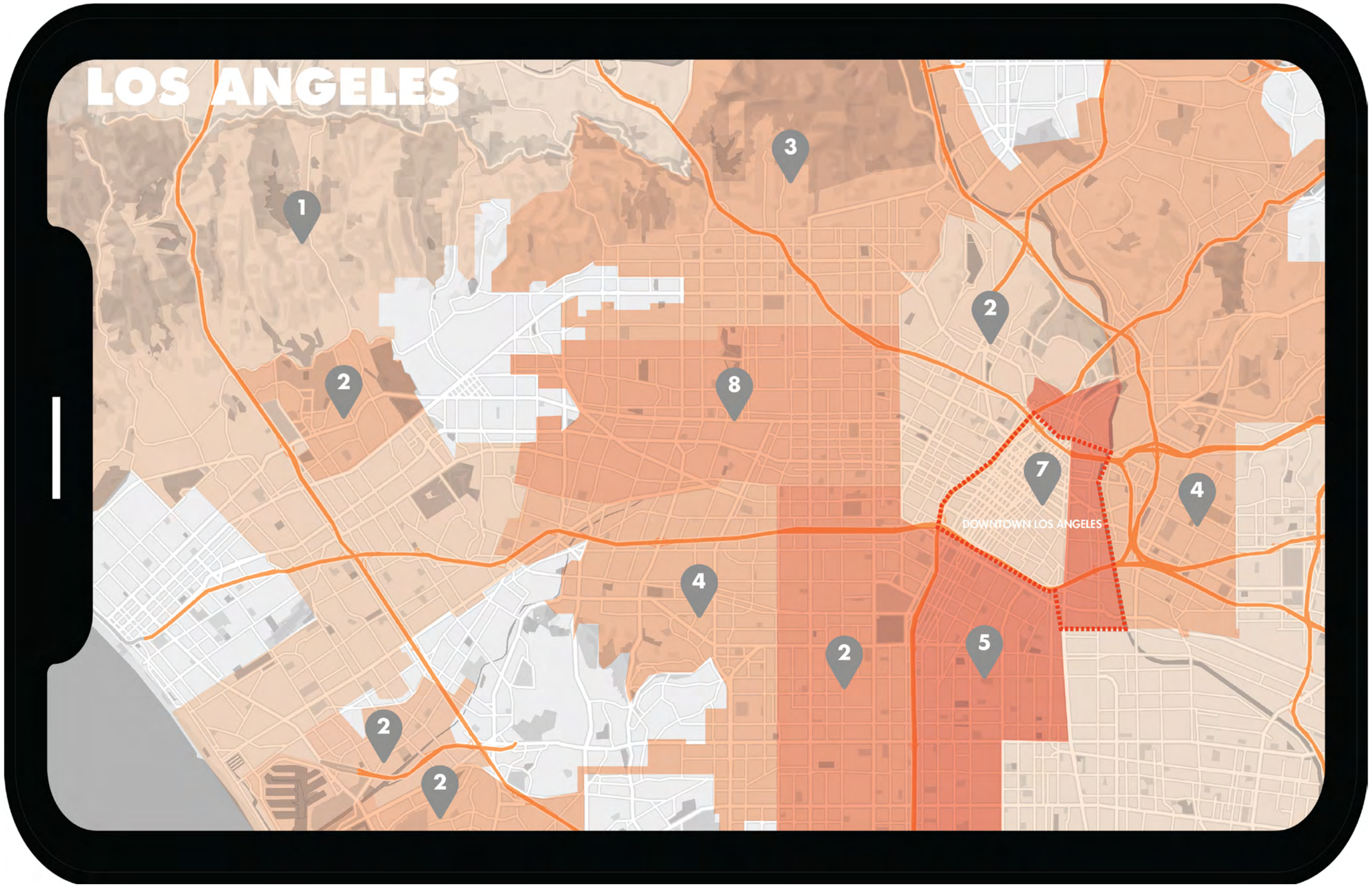


Figure 36: City-scale Usere Interface
Memory hotspot zones
by Author

ASSEMBLING MEMORIES

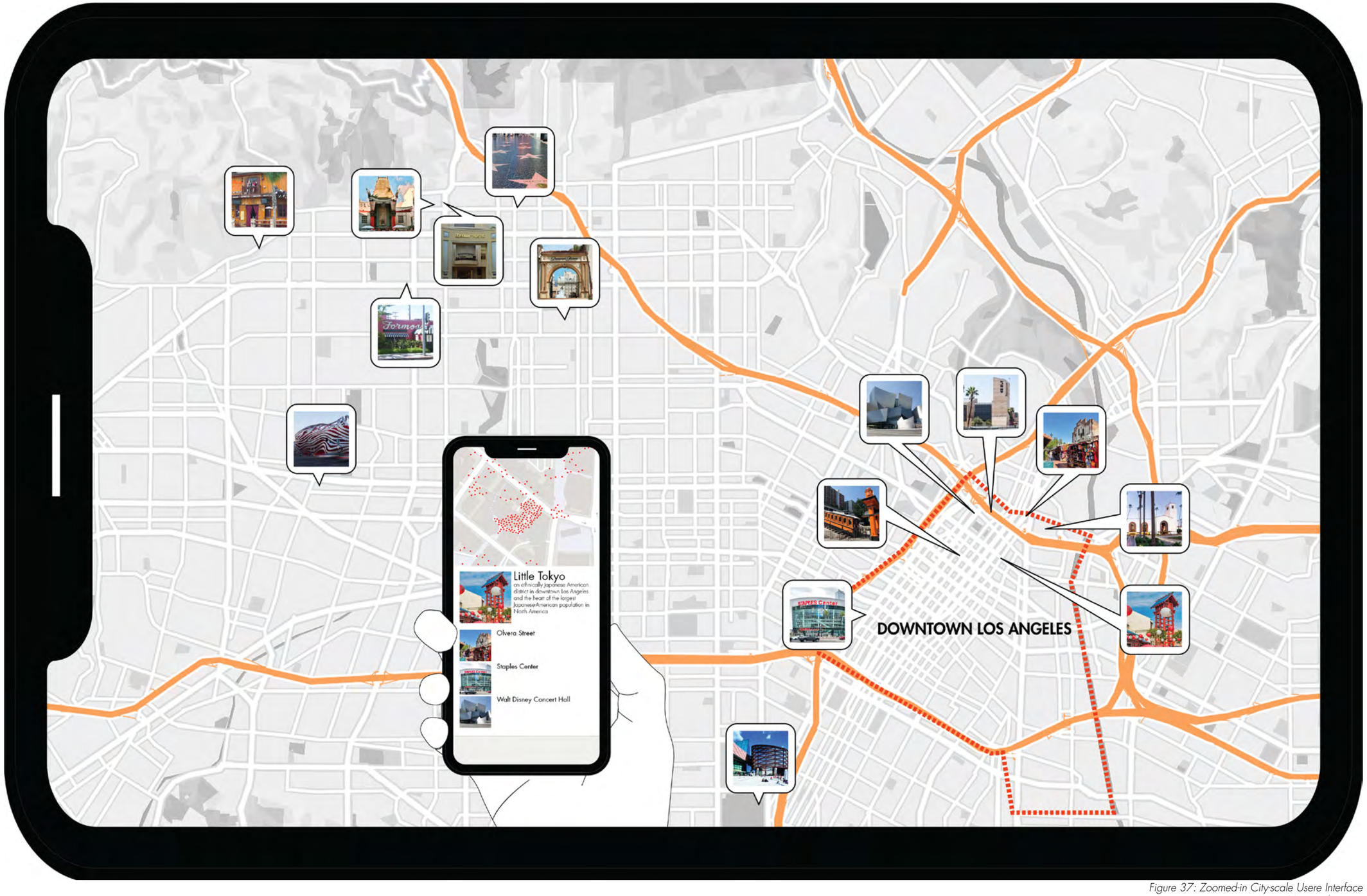


Figure 37: Zoomed-in City-scale Usere Interface
Memory hotspots
by Author

Testing Ground at Japanese Village Plaza in Little Tokyo, Los Angeles

Little Tokyo in Los Angeles, a vibrant neighborhood steeped in cultural history, serves as the ideal testing ground for the "Assembling Memories" project. This historic district, known for its rich Japanese heritage, offers a unique blend of traditional and contemporary urban experiences. The neighborhood's architecture, public spaces, and community life (Figure 39) provide a diverse tapestry of personal and collective memories, making it an excellent case study for the project.



Figure 38: "Assembling Memories" UI by Author

ASSEMBLING MEMORIES

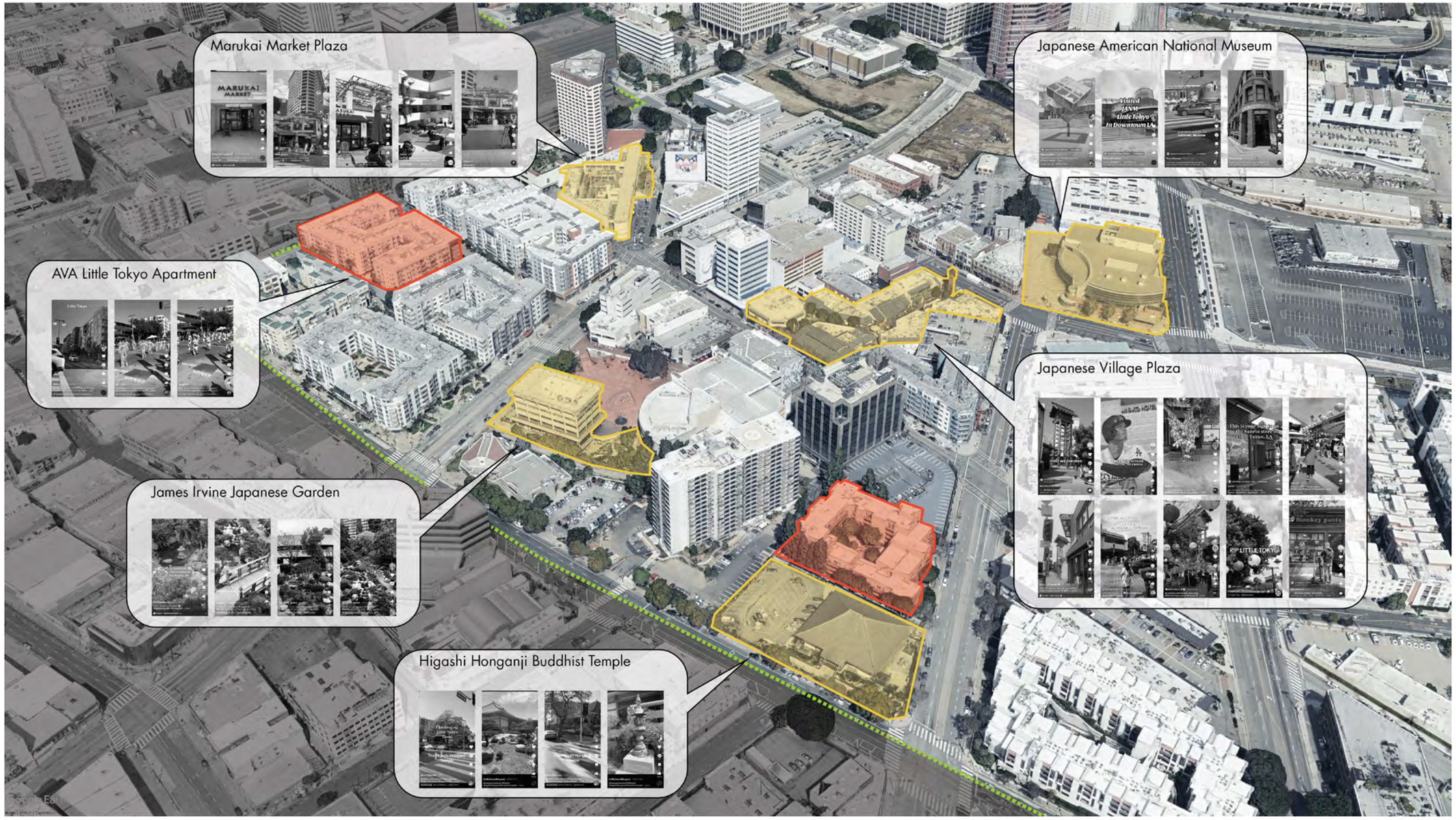


Figure 39: Architecture Typology surrounding Japanese Village Plaza in Little Tokyo, Los Angeles by Author

ASSEMBLING MEMORIES

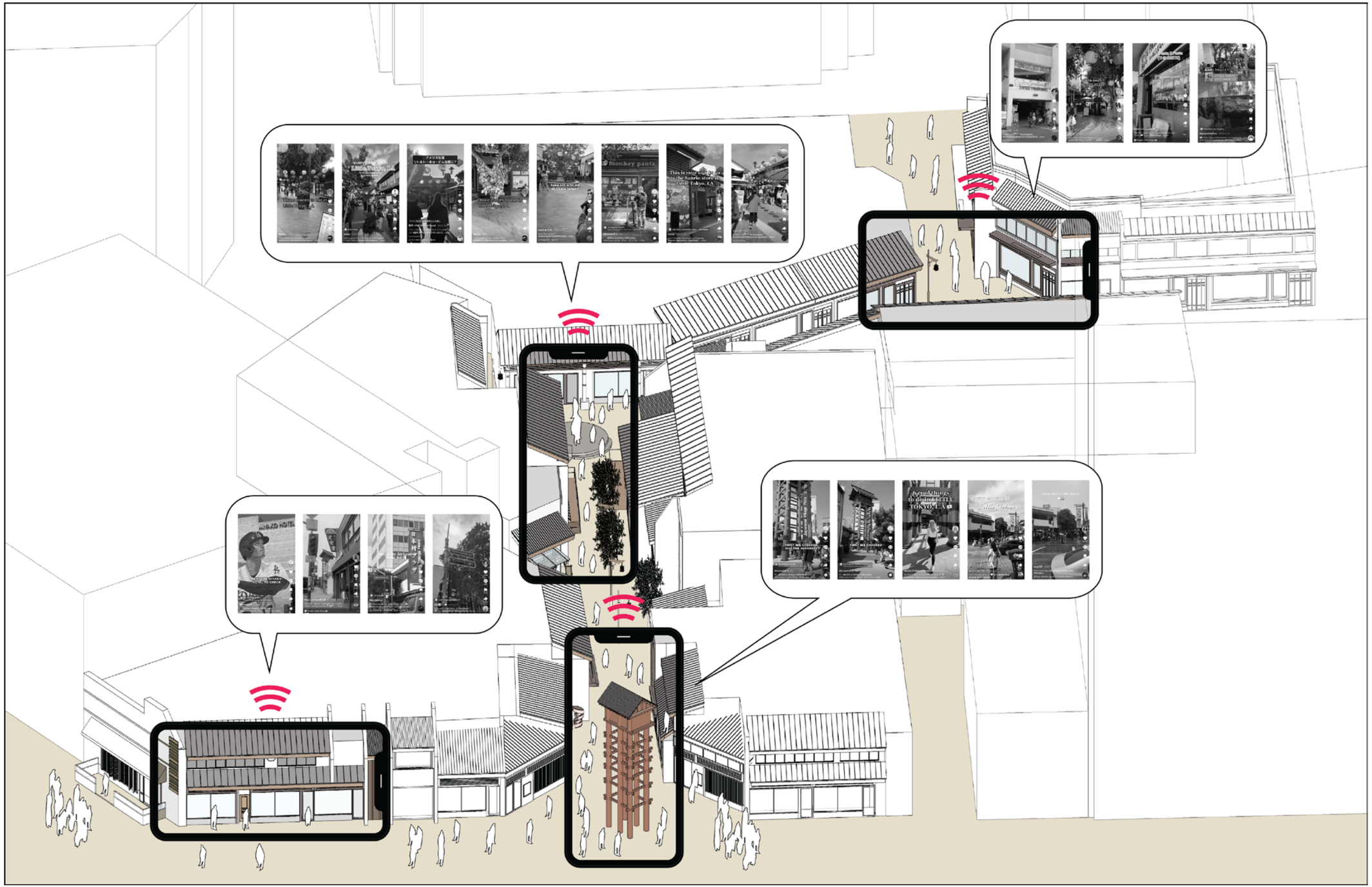


Figure 40: Japanese Village Plaza
by Author



Figure 41: AR Mode Review 1
by Author

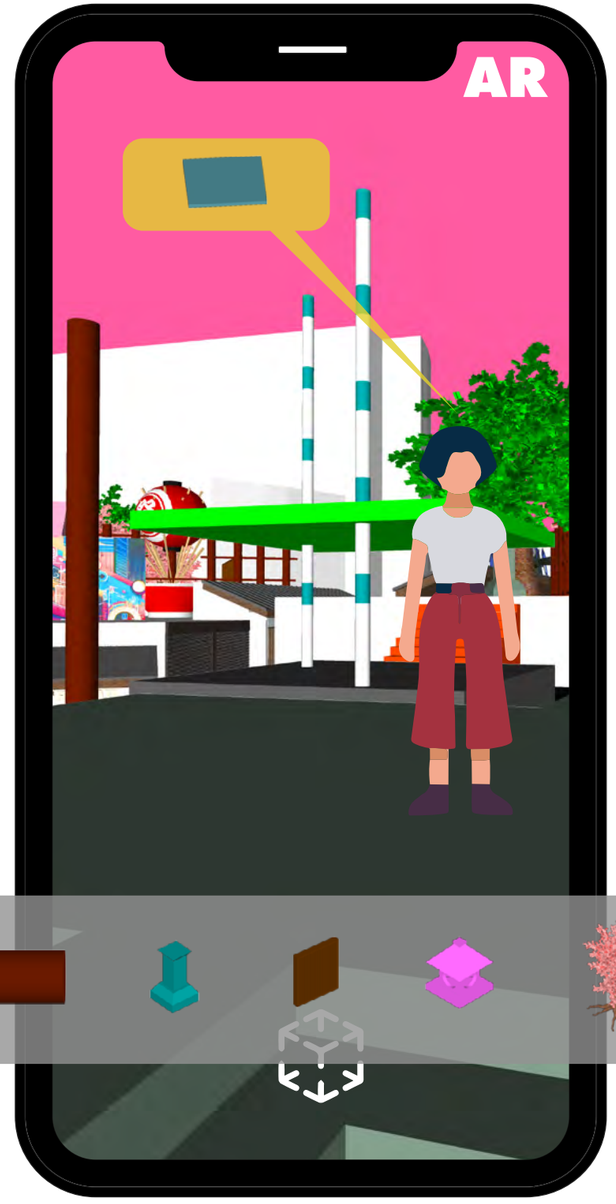


Figure 42: AR Mode Review 2
by Author

ASSEMBLING MEMORIES



Figure 43: Existing personal memory recording on Tiktok in Little Tokyo by Author

ASSEMBLING MEMORIES



Figure 44 Proposed "collective Memory world" Mode in Little Tokyo by Author





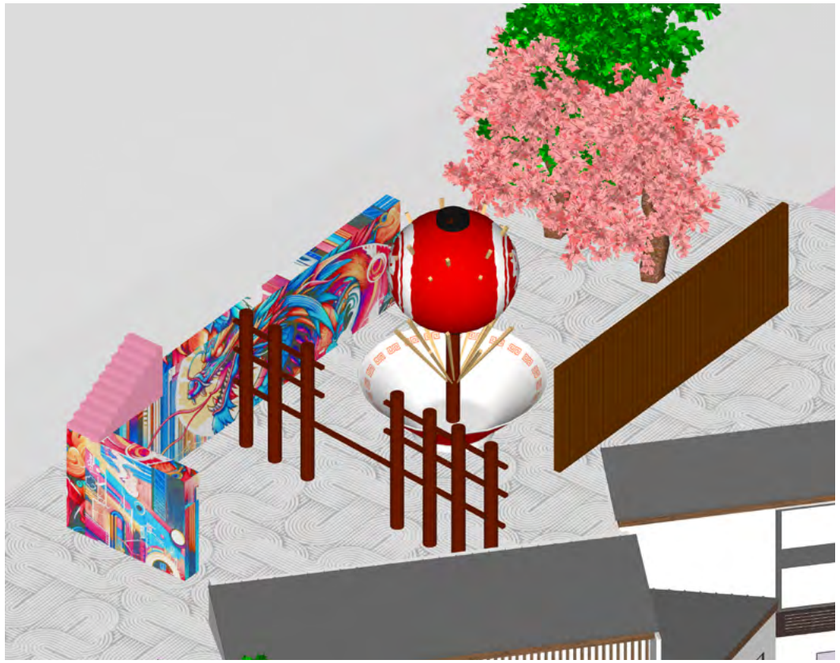




Figure 45: Architectural components to collective memory form types by Author

ASSEMBLING MEMORIES



Figure 46: AR Mode Street View
by Author

Syntax and Organization

In Assembling Memories, the syntax and organization are divided into two main layers: a stable foundation and a collage layer. The stable foundation refers to the existing urban contexts which provides a cohesive structure that anchors the entire system.Interwoven with this foundation is the collage of organic layers. A gradually growing world of memories is created through the user's constant addition of different personal memories.

The professional architects will take the lead in establishing the initial framework to ensure the recognizability of the memory world, as well as its more logical expansion and development. This involves establishing a link between the virtual and real worlds. The framework resulting from this linkage involves identifying key 'hotspots' (places) and analyzing their surroundings. In the case of Little Tokyo, the street grids, such as the form of the streets, the junction with other streets, inner sections, etc. will provide a sense of coarse scale of the virtual world reflecting the physical world. The building-by-building will determine the organization of the space, like the walking space or gathering space as an intermediate scale. (Figure 47, 48)



Figure 47: Little Tokyo neighborhood figure ground by Author

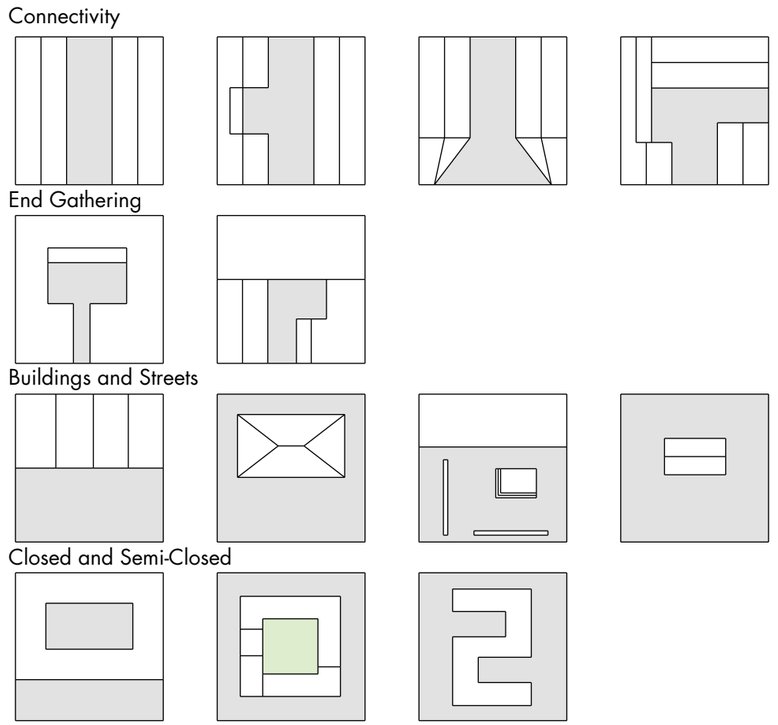


Figure 48: Little Tokyo form of streets and space topologies by Author

Then, this topological organization will be categorized into four levels based on the existing context of Japanese Village Plaza and its surrounding landmarks, including the James Irvine Japanese Garden at JACCC and the Higashi Honganji Buddhist Temple: **urban spaces**, **landscapes**, **buildings**, and **constructs**, ranging from large to small scales. In the **urban space** layer, the project focuses on the relationship between streets and buildings, takes the spatial composition of the Japanese Village Pla-

za as a reference and discusses the use of gathering space as the core space to connect the memory world of the Little Tokyo. In terms of landscape, the project zooms into James Irvine Japanese Garden at JACCC to analyze the form of the landscape, softscape and hardscape, as well as the elements like paths, water features and vegetation that define the space themes. For the building layer, the design draws on traditional Japanese-style architecture—such as that found in Japanese Village Plaza and the Higashi Honganji Buddhist Temple—to explore how sloped roofs help shape communal gathering spaces. Lastly, the construct layer introduces unique small features, such as walls, gates, or billboards, and examines how these elements define and shape the space.

The first layer, urban space, focuses on the spatial grid of Japanese Village Plaza. The public gathering space, with its open central area, is reinterpreted as a modular organizing system that forms the backbone of the memory world. This organizational system is adapted on the basis of topology according to different events and thematic needs, but essentially this abstraction maintains the essence of the physical space while providing areas for layering and expansion of memory. For instance, memories tied to gatherings, markets, or festivals might occupy prominent nodes within the grid, reflecting their communal significance and allowing these fragments to form networks of interaction over time.

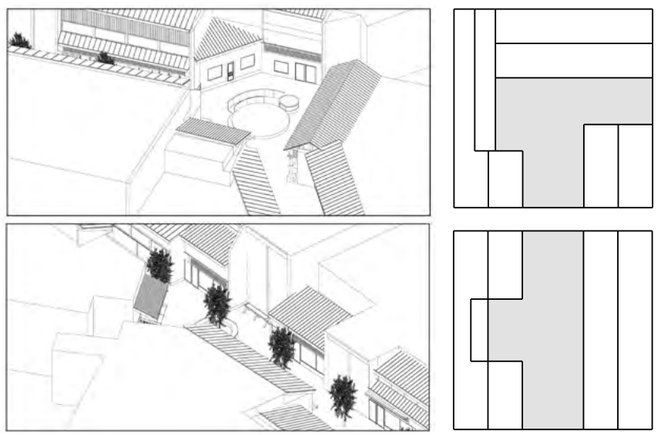


Figure 49: Japanese Village Plaza gathering space and topologies by Author

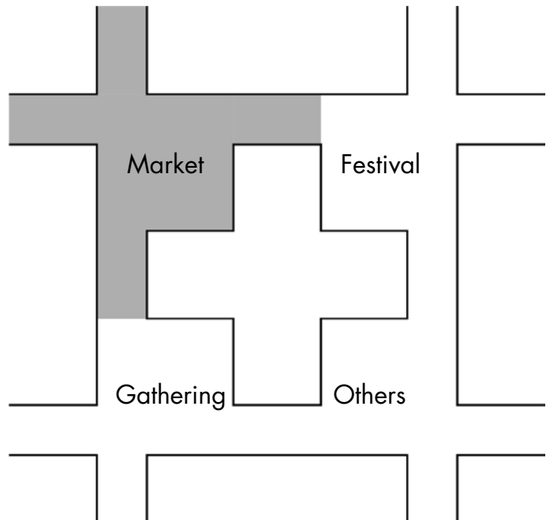


Figure 50: Spatial Grid and Prominent Nodes by Author



Figure 51: Spatial Grid and Prominent Nodes Implementation in Assembling Memory by Author

The second layer, landscape, introduces elements inspired by the James Irvine Japanese Garden (Figure 52). Features such as water streams, bamboo groves, and stone pathways are abstracted into symbolic nodes that represent tranquility, nature, and reflection. Users who resonate with this garden may simultaneously incorporate these elements into the memory world. Due to varying personal impressions of the garden, they may select different symbols—such as water features or trees—to capture their unique memories (Figure 54), building freely upon the garden's stable landscape framework (Figure 53). Similarly, a bamboo grove becomes a space for layering personal recollections associated with silence, growth, or meditative experiences, offering an organic counterpoint to the urban grid. (Figure 55)



Figure 52: James Irvine Japanese Garden at JACCC, 2023
Photo by Katrina Frederick
https://jaccc.org/spaces/james-irvine-japanese-garden/

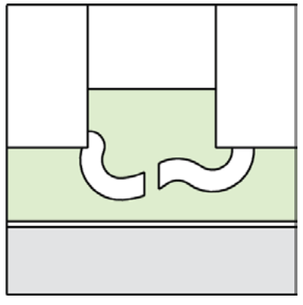


Figure 53: James Irvine Japanese Garden at JACCC Topology
by Author



Figure 54: Abtracted Water Streams and Stone Pathways in the Memory World
by Author



Figure 55: Abtracted Bamboo Groves in the Memory World
by Author

The third layer, building, draws on the physical and symbolic qualities of the traditional Japanese-style buildings, such as that in Japanese Village Plaza and Higashi Honganji Buddhist Temple (Figure 56). Key elements, such as the sloped roofs and structural forms of the temple, are abstracted and reinterpreted to serve as anchors for memories tied to spirituality, cultural practices, or transitions. Similarly, while maintaining the key architectural form—the sloped roof—users may combine other architectural components to craft an aggregation that closely aligns both in ambiance and overall form with the existing traditional Japanese-style buildings. For example, a sloped roof might act as a sheltering node for moments of quiet reflection or spiritual events. (Figure 57, 58) These architectural elements lend form and thematic depth to the memory world, grounding its evolving content within a clear spatial and cultural context.

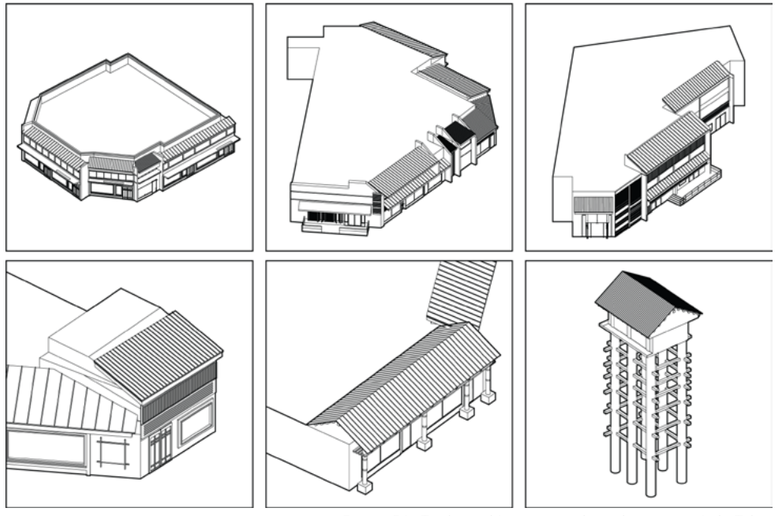


Figure 56: Traditional Japanese-style architecture in Little Tokyo
by Author

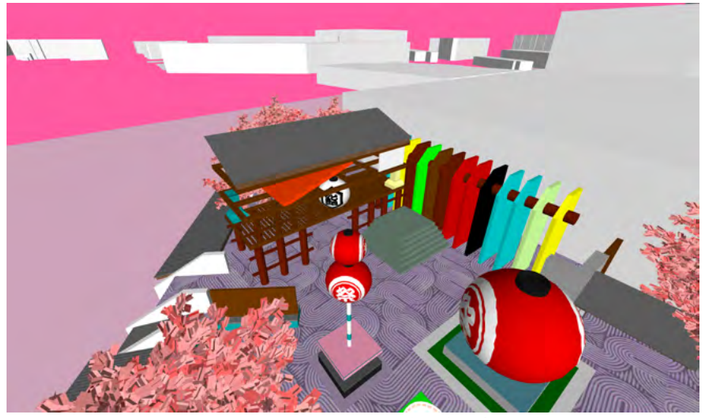


Figure 57: Sloped Roof Spatial type 1 - Main Building
by Author



Figure 58: Sloped Roof Spatial type 2 - Rest Area
by Author

The fourth layer, construct, focuses on smaller-scale symbolic features such as Torii gates and Japanese lanterns, which not only enrich the spatial experience but also reinforce the design's organic growth (Figure 59). Their symbolic resonance often outweighs their physical form, functioning as transitional markers or gateways that trigger personal memories in the context of specific events. For instance, a Torii gate may serve as an entry point for life transitions, such as a first visit to the plaza or the celebration of a milestone, while Japanese lanterns offer focal points for recollections tied to illumination—night festivals or gatherings that evoke a distinctive sense of place and atmosphere.(Figure 60, 61, 62)

Moreover, by providing a flexible framework for combination, they enable users to freely assemble and reimagine new spatial elements within the existing context. For instance, integrating a tree planter with a Japanese lantern echoes the tree pools already found in Japanese Village Plaza, yet each component of this new composition reflects personal memories of the place. (Figure 63, 64)

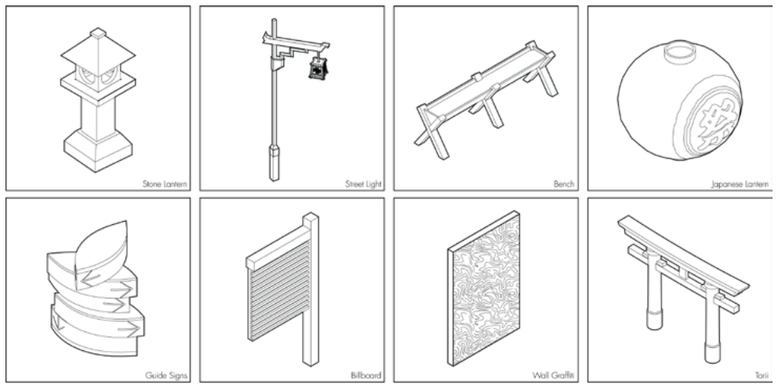


Figure 59: Smaller-scale Symbolic Features in Little Tokyo
by Author



Figure 60: Night Festivals in Japanese Village Plaza
Screenshot from Video "Walking Los Angeles Little Tokyo at Night" by ActionKid
https://www.youtube.com/watch?v=h92gdJi0svA&ab_channel=ActionKid



Figure 61: Gatherings and Events in Japanese Village Plaza
Photo by Theo Ponthieux
https://sugoimart.com/blogs/sugoi-mart-blog/everything-you-need-to-know-about-little-tokyo-los-angeles



Figure 62: Gathering Space Assembled with Torri gate, Japanese Lanterns in the Memory World
by Author



Figure 63: Tree Pool in Japanese Village Plaza
Photo by City Sightseeing Los Angeles
https://www.facebook.com/people/City-Sightseeing-Los-Angeles/100070188047526/
Edited by Author



Figure 64: New " Tree Pool" of Personal Memory Collection
by Author

Overall, by establishing a syntactic and organizational framework that merges a stable foundation with organic growth, the "memory world" can, to some extent, be regarded as an extension of the physical realm. It offers a sense of familiarity to those who have lived in or visited Little Tokyo. Through an analysis of the street and urban-space topology in selected parts of Little Tokyo, I lay the fundamental groundwork for the memory world, and from this basis derive four primary layers: urban space, landscape, architecture, and constructs. These layers collectively form a multidimensional framework, linking Little Tokyo's real environment with a continuously expanding "memory world."

More specifically, the topology of streets and building relationships in Little Tokyo—such as the Japanese-style street patterns of Japanese Village Plaza, the landscape elements of the James Irvine Japanese Garden, and the distinctive spatial quality shaped by sloped-roof constructions—serves as a central reference for designing the memory world. For instance, narrow streets leading to communal gathering spaces, together with water features and greenery in the garden, enable users to perceive a direct connection between the "Little Tokyo" in the memory world and its real-world counterpart. Summaries of traditional Japanese architectural forms (including the unique spatial ambiance, which provides a sheltering node for moments of quiet reflection or spiritual events underneath, created by sloped roofs) further reinforce this sense of connection. In addition, local small-scale features like Japanese lanterns or Torii gates, while retaining their essential structure, can be merged with abstract activities to act as memory triggers, forging a closer link between intangible events and tangible spaces. For instance, merging a tree pool with Japanese lanterns in Japanese Village Plaza produces a new element that draws upon the local construct's collective memory while also incorporating more individual recollections.

Architectural Elements Sample in Memory World

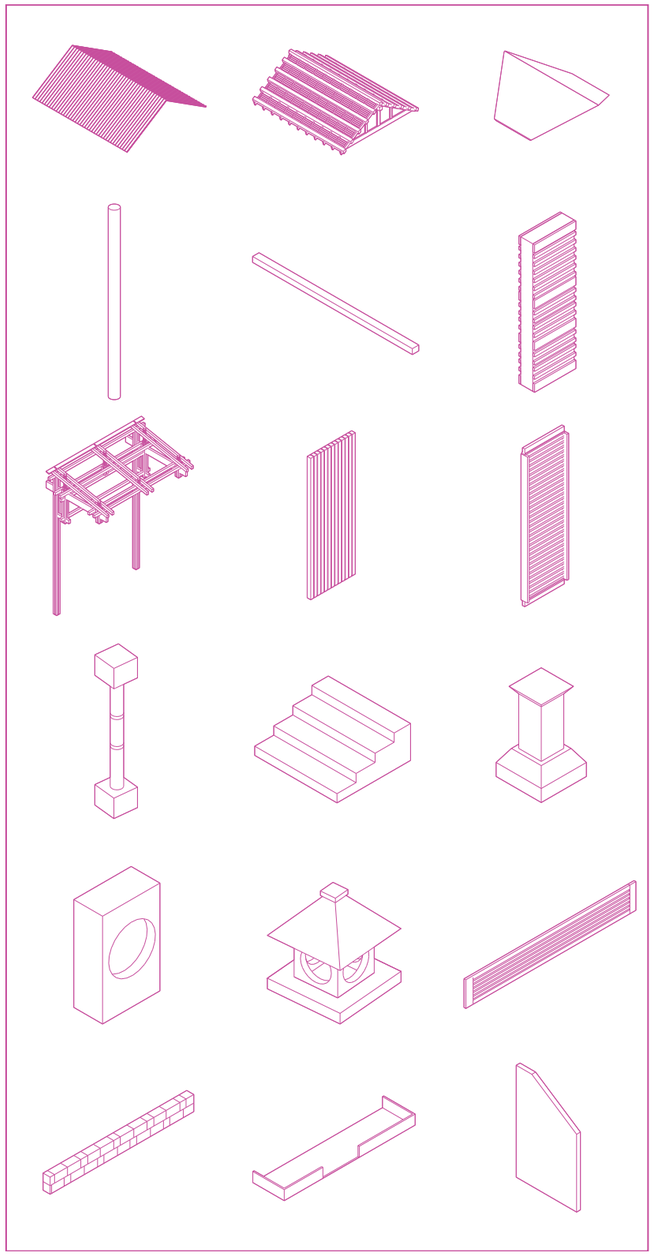
The extracted architectural elements were systematically categorized into three distinct types: extraction, abstraction, and actualization.(Figure 65)

Extraction: In this phase, I deconstructed Japanese-style architecture to extract distinctive structural or material elements. These components were kept in their original forms and broken down to their most fundamental parts. For instance, elements such as traditional wooden beams, roof tiles, and sliding doors were identified and preserved in their authentic appearance, providing a deep structural understanding.

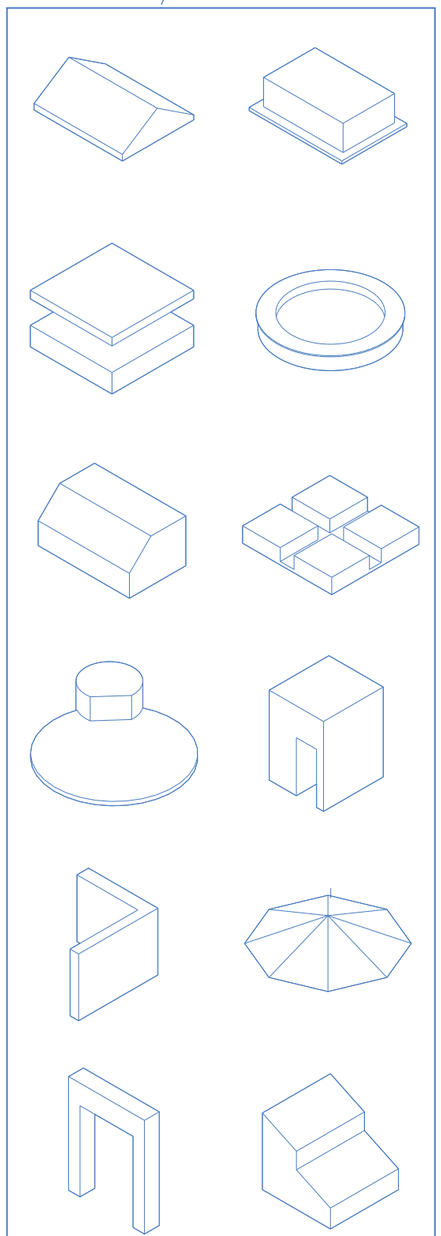
Abstraction: This phase involved the abstract representation of certain architectural masses or spaces that, while not distinctly unique in their architectural details, are emblematic of Japanese Village Plaza. These abstractions aim to capture the essence of the plaza's spatial arrangements and overall massing. For example, the plaza's layout and the spatial relationships between its buildings were simplified into basic geometric forms to identify key components for the final design.

Actualization: Here, unique items representative of Japanese culture, such as local food, souvenirs, and other artifacts, were preserved in their original forms. These items can be used as unique architectural components, maintaining their cultural significance while contributing to the overall memory world. This category ensures that cultural elements are not lost in translation but are preserved and celebrated within the architectural context.

Extraction:
Components reduced to fundamental elements.



Abstraction:
Architectural masses of essentially spatial layouts or forms



ASSEMBLING MEMORIES

Actualization:
Components preserved in original form

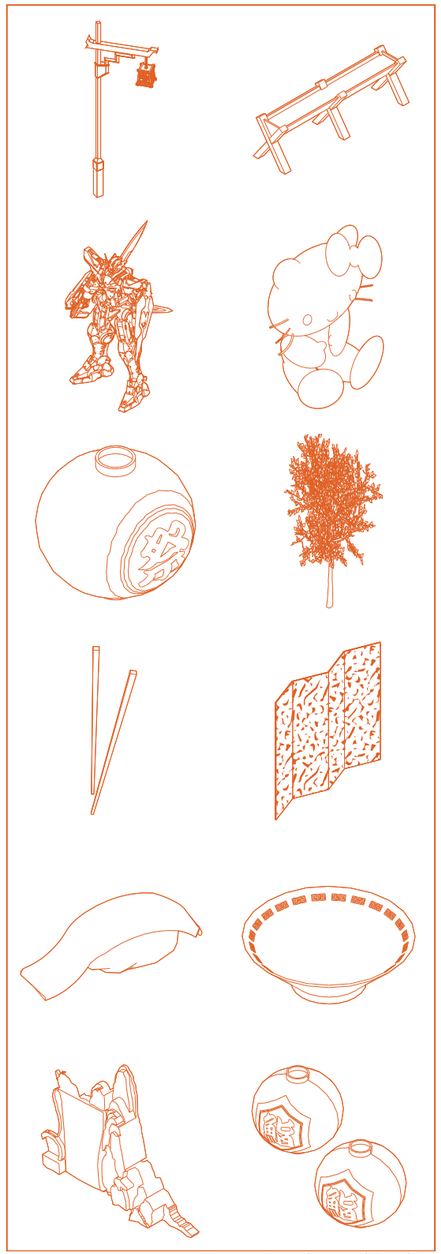


Figure 65: Architectural Topology
3 main typies of architectural elements are categorized: Extraction, Abstraction and Actualization
by Author

Memory interacting and sharing

When integrating your personal memory architectural component, you have the opportunity to collaborate with others, combining your elements into more complex and engaging buildings or spaces. Alternatively, you may choose to overlay your components onto existing structures created by others. This form of personal memory sharing is articulated through architectural representation.

Upon completing your memory construction at a specific location, the architectural components you select will encompass more data compared to traditional architectural components. These components function as triggers; other users can click on your architectural component within the application to access your TikTok videos of the location.

ASSEMBLING MEMORIES



Figure 66: Memory interacting and sharing UI by Author

Platform Implementation Framework

To ground the Assembling Memories platform in practical, operational terms, a structured methodology is proposed for implementation. This framework clarifies how content will be managed, user interactions facilitated, and memory integration realized, ensuring the platform operates effectively and remains user-driven while maintaining coherence.

Content Curation and Tagging System

The platform's content curation begins with an automated AI-driven tagging system that categorizes user-generated memory fragments based on various attributes, such as location, themes, and user-defined keywords. This tagging framework enables fragments to be automatically grouped into collections, creating a dynamic network of memories that users can navigate. These clusters form an intuitive spatial and thematic map, helping users explore and engage with collective memories while maintaining an organized memory world.

Memory Triggers and Interactive Components

Each memory fragment within the platform serves as an interactive memory trigger. These components activate upon user interaction or proximity, presenting layers of individual and collective memories that bring the architectural elements to life. This interaction model makes the experience more immersive, grounding each memory in both cognitive association and place immersion, thus allowing users to experience memory as an evolving environment.

Initial Curation and Moderation by Professional Team

The initial framework and memory structure are curated by a professional team, including architects, designers, and community advisors, to provide a foundational spatial layout that guides users in creating cohesive contributions. This curated starting point establishes thematic and spatial

anchors for the memory world, ensuring a coherent experience for new users. Additionally, professional moderation ensures that content remains balanced and inclusive, and community diversity is consistently represented.

User Contribution and Adaptive Growth

The platform emphasizes collaborative assembly, where users are encouraged to contribute, layer, and link their memories within the memory world. Through an adaptive architecture, individual contributions can influence and reshape the memory landscape, allowing users to organically create a shared urban memory world that continuously evolves to reflect collective experiences.

Conclusion

A contemporary way to build virtual collective memory world upon physical world.

The thesis Assembling Memories explores the intricate relationship between architecture and memory, proposing a modern methodology for recording and sharing memories within today's digital landscape. The central objective is to design a user interface for assembling architectural memories within the Metaverse. This platform leverages TikTok data, transforming video recordings into interactive architectural components that enable a bridge between physical and digital spaces. Grounded in the principles of architectural worldmaking, this Metaverse-driven platform integrates AR technology to bring memory-based architectural elements to life, challenging traditional boundaries in architecture.

At the core of the thesis is the concept of place immersion, where physical and virtual environments merge, empowering users to engage with personal and collective memories in new ways. This immersive framework redefines architectural engagement, transforming interactions within both urban and virtual spaces.

Collage emerges as a key tool in this architectural worldmaking approach, enabling fragmented elements—whether personal memories or architectural components—to form a unified yet dynamic collective whole. Each user's memory functions as an architectural element that, when combined with others, contributes to a collective memory world.

Historical references like Piranesi's Plan of Campo Marzio and Sam Jacob's Empire of Ice Cream further highlight the collage technique's role in architectural worldmaking. Both projects blend real and imagined elements, creating speculative urban spaces that resonate with the thesis's

approach of assembling fragmented personal memories into cohesive architectural expressions within the Metaverse.

Additionally, the framework draws inspiration from case studies such as Wist, Decentraland, Pokémon Go, and Streetmuseum, each demonstrating how AR, geolocation, and user-generated content can enhance architectural design.

Using Japanese Village Plaza in Little Tokyo, Los Angeles as the testing ground, the thesis demonstrates how personal memories can be spatially represented and continuously shaped within a collective memory world. This evolving urban memory fosters user interaction and participation, blending physical and digital environments while enhancing users' emotional connection to their surroundings.

In conclusion, this thesis redefines architecture's role in memory preservation through place immersion and collage. Personal experiences are woven into a collective urban memory that evolves over time, shaped by modern technologies and user-generated content. By providing new terminology and a flexible design framework, the thesis offers fresh insights into how cities can be molded by the collective memories of their inhabitants, bridging physical and digital spaces to create richer, more meaningful environments.

However, certain limitations accompany this approach. Social media data may not fully capture the diverse experiences of all community members, potentially amplifying certain voices over others. Furthermore, while architects guide the initial construction of architectural elements from TikTok data, the user-driven assembly process introduces unpredictability, which may not fully align with everyone's needs.

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