Manufacturing a Woman to Order:

Exploring Nonhuman Agency and Gendered AI in East Asia

through Machinima and Virtual Production

by

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The blood of birds brings sorrow, yet the blood of fish does not. Blessed are those gifted with a voice.

鳥の血に悲しめど、魚の血に悲しまず。声あるものは幸いなり。

- Saitō Ryokuu

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ABSTRACT

This thesis examines the construction and representation of non-human characters in a highly gendered, AI-driven future in East Asia. It culminates in the CGI-animated short film *Manufacturing a Woman to Order*, which follows a female AI agent and explores the intersection of technological progress and gender politics. By focusing on the creative process of game engine cinema, the research merges speculative narrative and interdisciplinary worldbuilding with virtual production filmmaking, integrating non-human agents into social discourse. Through this integration, the thesis underscores the persistence of gender stereotypes in AI design and calls for a critical reassessment of the sociocultural impacts of technological advancements on East Asia's future.

Keywords: machinima, game engine cinema, virtual production, nonhuman agency, East Asian Futurism, gendered AI.

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This film is a love letter from nonhumans to humans; it is also a love letter to every artist, writer, scholar, designer, and engineer whose work has ever inspired us. It is a tribute to the hands and minds that shaped not only the tools I used but also the ideas that guided me, reminding me that creation is never solitary - it is always built upon a collective legacy of imagination.

I would like to dedicate this letter, above all, to my thesis advisors, **Fidelia Lam** and **Ala Roushan**. Thank you for your inspiration, guidance, and unwavering support over the past two years. You helped me understand the deeper meanings behind artistic practice, and you encouraged me to trust my instincts, break through boundaries, and fully inhabit my own voice. Your mentorship gave this project its clarity, depth, and conviction. I would also like to thank **Andrea Khôra** for her generous insight and intellectual guidance, which helped illuminate new dimensions in my research and creative process.

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Finally, to my best friend, mentor, and partner of 18 years - Thank you for making all of this possible.

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Chapter 1 Introduction

1.1 Research Background and Motivation

When I was a child, I lived in Fukuoka, Japan. Every afternoon, I watched Fujiko F. Fujio's "Doraemon" - a story about a blue robotic cat from the future who lived in Nobita's closet, using his superhuman intelligence and memory to help change Nobita's fate. In reality, however, creating robots with such intelligence is extremely challenging and expensive. Yet, as artificial intelligence (AI) advances, what once seemed like pure science fiction now appears increasingly feasible.

In 2024, Professor Shoji Takeuchi at the University of Tokyo successfully engineered bio-skin from living human cells and attached it to a robot's face (Bathgate, 2024). The same year, the World Robot Conference in Beijing showcased multiple humanoid robots with exaggerated gender features (Conference, 2024), prompting widespread debate. At the "We, Robot" conference in October, Tesla revealed its latest humanoid robot, Optimus, and announced plans for mass production. The company claimed Optimus could handle a range of tasks, from teaching and childcare to dog walking, grocery shopping, and package delivery (Tesla, 2024). These breakthroughs suggest that humanoid robots, long a staple of science fiction, may soon appear in hospitals, nursing homes, households, and public spaces.

However, entangled with these rapid technological changes, humanity is now facing a broader "existential crisis," and the future of East Asian societies is also becoming more uncertain. It is important to note that these challenges are not exclusive to East Asia; however, this research adopts a cultural focus to gain deeper insight into the unique complexities of this region and to reflect on how it parallels in other cultures. For example, the 2015 film "Ten Years" depicted the possible fate of Hong Kong in 2025 under China's political regime (Chow, Au, Zune, Leung, & Wong, 2015). It presented a future that couldn't be more different from the "universal happiness" myth propagated by the Chinese government. In fact, such mythological visions of the future are common in East Asia's mainstream political discourse, including Japan's *Innovation 25* and *Moonshot 50*, South Korea's *National AI Strategy*, and China's recent *14th Five-Year Plan* and *2035 Long-Range Vision*. In "*Manufacturing a Woman to Order*," I explore the idea of a virtual smart city and non-human characters within the context of East Asian futurism, imagining a post-human future where humans and non-humans coexist. In the East Asian future I depict, much like the movie Ten Years, traditional urban landscapes still remain. Two important frameworks shape this speculation:

(1) Gender Performance and the Male Gaze in East Asian Technoscience,

Despite Donna Haraway's vision of a post-gender future in "A Cyborg Manifesto" (Haraway, A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century, 1911), AI innovations in East Asia, particularly in Japan and China, often reinforce

traditional gender roles. I will further explore the underlying causes of this phenomenon and its impact in Chapter 2.

(2) The temporality of East Asian futurism,

East Asian futurism encompasses both spatial and temporal dimensions, with its visions of the future often constrained by cultural and historical ties to the past. This temporal complexity creates a paradoxical imagination that strives toward the "future" yet remains deeply connected to the "past."

Based on this context above, the thesis proposes a phenomenological narrative framework: *East Asia's political, social, cultural, and historical trauma subtly influences technological development, shaping the future of non-human entities and the region's future*.

How will the growing interconnectedness between East Asian societies and the global landscape shape our technological future? How should we rethink our connections with other species and non-human entities? Or perhaps, should we revisit Paul Gauguin's timeless questions: "*Where do we come from? What are we? Where are we going*? (Gauguin, 1897) "

While this thesis may not offer definitive answers to these questions, it emphasizes the urgency of rethinking the role of technology, particularly the need for each culture to investigate its own sociotechnical issues within the context of its unique historical background. In the past, these questions were often homogenized and compared against Western frameworks in a linear timeline. I argue that we must critically reflect on the human future as defined by the notion of modern progress. This is not to say that we should reject technological advancement, but rather, we need to deeply examine the structures and limitations technology imposes on us and recognize that accelerationism is not the only solution to social and political problems.

In "*Technosymbiosis: Figuring (Out) Our Relations to AI*," N. Katherine Hayles explores metaphors such as the cyborg, "making kin," human-machine symbiosis, and technosymbiosis, and their implications for women. She calls for moving beyond human-centered thinking to address the root causes of gender bias (Hayles N. K., Technosymbiosis: Figuring (Out) Our Relations to AI, 2023). This thesis builds on her work by diving deeper into these social, cultural, and political metaphors within East Asian societies, exploring the potential outcomes of these ideas from a non-human perspective.

In the past, I created a short film exploring East Asian futurism, focusing on the homogenizing effects of highly technologized East Asian societies. However, "*Manufacturing a Woman to Order"* tackles an even more urgent issue, as these technologies are already available today. As part of this inquiry, I examine how machinima, as a creative medium, shapes the construction and representation of non-human female characters in highly gendered AI design, and how these representations reflect the tension between technology and traditional social structures in East Asian societies.

Finally, drawing from my background in social justice, law, and filmmaking, this thesis aims to immerse the audience in a speculative vision of East Asia's future, a future where humans, machines, and non-humans coexist. At first glance, it might seem like a dystopian story, but in reality, it's deeply rooted in the technological history of East Asian societies - a story that's all too real.

1.2 Framing the Key Terms

In establishing the terminology for this thesis, careful consideration has been given to the selection and definition of key terms related to non-human entities. Rather than establishing fixed definitions in a rapidly evolving technological landscape, this discussion aims to outline the fundamental scope and context of these terms. As human enhancement technologies advance and the overlap between functionalism and anthropomorphism in robotics increases, traditional boundaries between machine and organism, nature and artificiality, continue to blur.

First, we should look at the term "***robot***". It originates from the Czech word "*robota*," meaning "forced labor," and was popularized by Karel Čapek's play *R.U.R. (Rossum's Universal Robots* (Čapek, 1921)*)*. While early depictions cast robots as synthetic lifeforms designed for menial tasks, the definition has become increasingly ambiguous and hard to standardized with technological progress (Nourbakhsh, 2013). While the International Organization for Standardization (ISO) and International Federation of Robotics (IFR) provide technical definitions emphasizing autonomy, programmability, and multifunctionality (Standardization, 2021) (Robotics I. F., Industrial Robots — Definition and Types, 2016), this thesis specifically focuses on "***humanoid robots"*** (which are designed to resemble human forms from basic structural similarities to highly realistic appearances (Yoshida, 2019) ,) and their gendered variations.

"Female robots," or gynoids, are a specific category of humanoid robots designed with gender-specific traits. Historically, as depicted in *R.U.R.*, gendered models reinforced binary labor roles, a trend that persists today through design choices such as color schemes and body proportions. It is important to note that not all robots are humanoid, nor do all humanoid robots have gender. However, based on the research, most humanoid robots and voice assistants are gendered (West, Mark, Kraut, Rebecca, Chew Han Ei, 2019)." Female robots are often designed to be almost indistinguishable from humans (e.g., Ava in *Ex Machina*, Garland, 2015), whereas male robots may only possess partial human-like features (e.g., the functional robot in *Robot & Frank*, Schreier, 2012). This gendered AI design may be intentional or unintentional.

In contrast, the term "***geminoid***," introduced by roboticist Hiroshi Ishiguro, refers to highly realistic robots that replicate specific individuals in appearance, behavior, and voice, serving as tools for studying human-machine interaction and identity perception (Ishiguro, 2007). Examples include the Tetsuko robot modeled after Tetsuko Kuroyanagi, Matsukoroid based on Matsuko Deluxe, Bina 48 modeled after Bina Aspen Rothblatt, Repliee R1 designed to resemble Ishiguro's daughter, and Yang Yang, modeled after researcher Song Yang. Although

both gendered humanoid robots and geminoid are important for understanding cultural and design implications, the thesis focuses primarily on the former while noting that geminoid, despite their prevalence, are not the main focus.

Artificial intelligence in this context is categorized into "***embodied AI***" and "***voice AI agents***" (hereinafter voice agents). Embodied AI integrates with a physical body to interact with the real world through perception and manipulation (Brooks, 1991). Grounded in embodied cognition theory, this approach views intelligence as an outcome of an entity's interaction with its environment rather than purely computational processing (Pfeifer, 2015). Embodied AI has a wide range of applications, including robotics, humanoid robots, autonomous vehicles, and medical assistance. These systems rely on vision, touch, and movement to execute complex tasks, highlighting the importance of their physical presence in achieving intelligence.

In contrast, voice agents specialize in speech-based interactions through functions like speech recognition, natural language processing (NLP), and synthesis, and can exist either as purely virtual entities or within physical embodiments. Both embodied AI and voice agent can exhibit gender traits, with gendered embodied AI manifesting in humanoid robots with gender-specific characteristics, and gendered voice agent expressing gender through synthetic voices, names, or virtual representations.

Finally, although the concept of the "***cyborg***" (cybernetic organism (Manfred Clynes and Nathan Kline , 1960)) has been influential - particularly through theoretical works like Donna Haraway's" *A Cyborg Manifesto*" (Haraway, A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century, 1911) - this thesis avoids using the term due to its ambiguous and evolving nature, as it could refer either to augmented organic beings or any hybrid entity combining organic and mechanical elements, which could complicate rather than clarify the discussion.

1.3 Scope and Limitation

"*Manufacturing a Woman to Order*" is informed by perspectives in gender studies, film theory, cultural studies, and non-human phenomenology, which analyze the political foundations of urban landscapes and their imaging. Given the vast scope of these disciplines, I have had to choose and highlight certain theories that are most relevant to my practice while excluding others. My approach focuses on theories that have the potential to significantly shape the final cinematic work. These theories help define the material elements of "*Manufacturing a Woman to Order*" - its characters, environments, devices, politics, and narratives. Yet, it's important to note that the film also stands on its own as an artwork without a direct reference to these theoretical guides, building interest and ambiguity that invite viewers to engage with the work on multiple levels.

In addition, the East Asian region includes Japan, China, South Korea, Hong Kong, and Taiwan. While these places share some common historical and cultural traits, there are

significant differences among them. Japan has been influenced by “wabi-sabi” (侘び寂び), a distinctive aesthetic and philosophical concept that embraces imperfection, transience, and the beauty of natural aging, while also developing the culture of "wa" (和), emphasizing collective harmony and etiquette. China, as the birthplace of Confucianism and Taoism, has deeply influenced the entire region, particularly in family structures, educational values, and social hierarchies. South Korea has blended Confucian traditions with modern popular culture, creating the unique "Korean Wave" phenomenon that has had global impact. Hong Kong and Taiwan, due to their unique historical backgrounds, have formed distinctive hybrid cultural identities by integrating local traditions with elements from British colonial or Japanese rule respectively. The differences among these regions are particularly evident in artistic expression, governmental policies, and technological innovation, largely due to their different paths to modernization and varying degrees of interaction with the West. That said, this thesis may not fully capture the diverse perspectives within the broader East Asian cultural context.

1.4 Research Methodology

1.4.1 Research Creation through Machinima

Vision in contemporary society has expanded beyond biological organisms to become part of a complex network of interconnected visual systems. Through machinima filmmaking, I explored how distributed agents operate in real life, particularly understanding the relationship between “Aria” and the “operating system” in “*Manufacturing a Woman to Order.*” This parallel between AI agent and AI system helped illuminate how autonomous agents interact and function within complex systems. Machinima, or game engine cinema, merges gaming technology with narrative experimentation, offering a unique methodological approach to research-based creation. This approach exemplifies artistic practice becoming a form of knowledge production (Owen Chapman and Kim Sawchuk, 2012). Through this methodological framework, the production process itself becomes a site of investigation and discovery, where theory and practice are mutually informative rather than hierarchically arranged (Erin Manning and Brian Massumi, 2014).

The uniqueness of machinima lies in its transcendence of traditional narratives, expanding the possibilities for the "empowerment" of marginalized subjects. Its significance can be understood through Deleuze and Guattari's concepts of "minoritarian (Gilles Deleuze and F élix Guattari, 1987 (Original work published 1980))" and the “people to come (Gilles Deleuze and Félix Guattari, 1994 (Original work published 1991))."

Deleuze and Guattari describe “minor” as a deterritorialized form of expression that challenges dominant power structures and envisions emerging communities. This approach aligns with Critical Design's emphasis on using design to provoke questions rather than provide solutions, challenging conventional assumptions about technology and society (Anthony Dunne and Fiona Raby, 2013). Machinima embodies this principle, occupying a liminal space between mainstream media like traditional cinema and video games. Through

the reconfiguration of existing media frameworks, machinima enables diverse narrative and visual possibilities. As William Brown and Matthew Holtmeier in their article "*Machinima: Cinema in a Minor or Multitudinous Key?*" suggest that machinima*'s* value lies in its multiplicity and decentralization, reflecting Hardt and Negri's concept of multitude. By leveraging game engines and virtual environments, machinima creators reimagine the boundaries between reality and fiction, making it not only a tool for visual experimentation but also a critical inquiry into technological and societal futures (William Brown and Matthew Holtmeier , 2013).

Within this context, my exploration of non-human narratives is closely tied to the concepts of *minoritarian expression* and the *people to come*. Non-human narratives move beyond anthropocentric perspectives, focusing on non-human and post-human existences while examining how technology, environment, and materiality shape future possibilities. This approach disrupts the singularity of dominant storytelling traditions, emphasizing multiplicity and decentralization, resonating with minor literature's deconstruction of territorialized structures.

Through machinima, I simulate perspectives of non-human entities, including artificial intelligence, operating systems, and humanoid robots, constructing fictional scenarios where technology and environment interactions take center stage. These works respond to how technological advancements redefine identity and social structures, aligning with the vision of the "people to come."

Using game engines as both cinematic subjects and filmmaking tools, the boundaries between image production stages blur. Filmmaking creates a self-contained virtual world, as Jussi Parikka describes, becomes a form of infrastructural image (Parikka, Operational Images: From the Visual to the Invisual, 2023). Unlike traditional filmmaking, where set design precedes shooting, virtual film production allows for iterative adjustments during filming. This process transcends traditional visibility, existing at the intersection of perception and computation.

This new mode of production is inherently grounded in behaviorism, materialism, and mechanistic worldviews. In other words, within the logic of modern "scientific" frameworks, anything can be simulated by a computer if technology permits it. The process relies on procedural simulation, integrating real-world footage with computer-generated effects. As Walter Benjamin notes in "The Work of Art in the Age of Mechanical Reproduction," the "reproducibility" of art is closely linked to its "precision (Benjamin, 2008)."

Virtual film production transcends hierarchical constraints through infrastructural imaging, enhanced by game engines' real-time interactivity. Machinima thus integrates multiple filmmaking techniques and foregrounds the agency of artificial intelligence and surveillance systems, aligning with Deleuze and Guattari's concept of assemblage (Gilles Deleuze and F élix Guattari, 1987 (Original work published 1980)). Virtual objects become active surveillance agents, capturing data with lenses and feeding it back into the system, creating a self-contained digital surveillance loop.

In "*Manufacturing a Woman to Order*", I adopt the concept of operational images, reconstructing reality through game engines to expand the expressive potential of unimagery. Unlike earlier machine vision films, such as Harun Farocki's *Eye/Machine I-III* (Farocki, Eye/Machine I-III [Film series], 2001-2003), Hideaki Anno's *Love & Pop* (Anno, Love & Pop, 1998), or Xu Bing's *Dragonfly Eyes* (Bing, 2017), I simulate speculative scenes rather than relying on archival footage. Here, open-world 3D aesthetics intersect with simulated NPCs and autonomous agents, blending posthuman agency and immersive environments.

As Yuk Hui proposes in *Recursivity and Contingency*, recursion and unpredictability drive technological evolution (Hui, Recursivity and Contingency, 2019). The machinima production process is similarly uncertain, this manifests as an ever-evolving, self-reflective experimental platform, reinforcing the critical and creative potential of image production and offering a distinctive method for exploring technology, culture, and the human future.

1.4.2 Interdisciplinary Worldbuilding

The construction of fictional worlds is inherently shaped by political, legal, economic, and social forces. In imagining a future East Asian city, I draw on Gayatri Chakravorty Spivak's concept of *worlding* , which critiques how colonial power structures mold representations of the Third World (Spivak, Three Women's Texts and a Critique of Imperialism, 1985). In "*Manufacturing a Woman to Order*", the fictional city of Dream Harbor symbolizes this process, reflecting how global narratives often portray East Asia as influenced by external powers rather than existing autonomously. These portrayals are deeply entangled with our socio-cultural imaginaries of East Asian cities, which have been significantly influenced by film, media, and video games. Following Edward Said's framework of "*Imagined Geographies*," these representations often construct East Asian urban spaces as hyper-technological, neon-lit dystopias or exotic "others" that serve Western fantasies rather than reflecting lived realities (Said, 2000). Such mediated imaginaries not only shape global perceptions but also influence how these spaces are subsequently developed and marketed, creating a complex feedback loop between representation and material reality.

My world-building methodology also incorporates speculative storytelling and *storyworlds*, emerging from the 1980s' narrative turn that shifted focus from purely text-based analysis to the broader cultural impact of narratives (Raphaël Baroni; Adrien Paschoud, 2021). The name *Dream Harbor* reflects East Asia's futuristic imagination, with its timeline set in 2050, inspired by the Chinese government's vision of achieving the *great rejuvenation of the Chinese nation* by 2049. However, Dream Harbor is not built solely from a Chinese perspective; rather, it embodies the layered and complex histories of the East Asian region.

In constructing Dream Harbor, I draw from my own birthplace, Taiwan, whose identity has been shaped by successive colonial experiences. Referred to as the "Orphan of Asia" in the 1980s, Taiwan underwent Japanese rule following the 1895 First Sino-Japanese War, followed by KMT control after 1945. These transitions generated profound cultural tensions, culminating in the 1947 February 28 Incident and the White Terror period (Kerr, 2018). As captured in Hou Hsiao-hsien's "A City of Sadness": "First the Japanese, then the Chinese. We

are devoured, ridden upon, and unloved" (Hsiao-Hsien, 1989). This historical memory continues to haunt Taiwan, profoundly shaping its visions of the future.

Dream Harbor emerges as a speculative vision of 2050 Taiwan, inhabiting a liminal space between historical memory and future narratives. It is neither a utopia nor a complete dystopia; rather, it exists as a liminal space between historical memory and future narratives.

1.4.3 Nonhuman Phenomenology

Deleuze once asserted: "Art, and especially cinematographic art, must take part in this task: not that of addressing a people, which is presupposed already there, but of contributing to the invention of a people... the missing people are a becoming, they invent themselves" (Deleuze, 2013). This thesis embraces this idea through a non-anthropocentric narrative perspective, positioning AI not in opposition to humans but as a fictional other. Rather than treating the virtual world as a mere tool, I view it as the purpose of creation itself, shifting the focus from simulating reality to exploring deeper philosophical and psychological questions within the virtual realm.

However, depicting a non-human perspective remains an inherent paradox. As a human creator, my representations of AI, robotic entities, and operating systems are inevitably filtered through human cognition, language, and cultural frameworks. This paradox is at the heart of ontological design, the idea that the tools we create shape us in return (Escobar, 2018). If AI and non-human entities are designed objects, they are also active agents in shaping human thought, behavior, and even subjectivity. This is particularly evident in AI-driven societies, where algorithmic infrastructures dictate social interactions, governance, and labor dynamics, reinforcing cultural narratives in ways that extend beyond human control. The mutual construction of human and the non-human can be understood through New Materialism, which rejects the notion of human agency as separate from material systems. Rather than assuming that AI and robotic characters in this work are passive artifacts, I view them as part of an intra-action (Barad, 2007), where human and non-human agents co-constitute each other. This perspective aligns with Actor-Network Theory (ANT), which conceptualizes networks of humans, technologies, and environments as relational assemblages rather than hierarchical structures (Latour, 2005).

In "*Manufacturing a Woman to Order*", the female robot Aria and the operating system are not mere projections of human imagination; they emerge within an entangled network of historical gender biases, socio-political conditions, and technological infrastructures. Their identities are shaped by the cultural memory of East Asian gender roles, inherited through AI datasets, labor automation policies, and the cybernetic legacy of robotics in East Asia. Through machinima and virtual production, this research does not merely represent AI, it actively enacts the process by which non-human agents acquire agency through human-technology interactions. At the same time, the concept of "mutual becoming" complicates the assumption that AI exists as an extension of human will. If AI is embedded in recursive systems that shape human behavior, then the boundary between the creator and the created becomes increasingly indistinct.

Graham Harman's "Object-oriented ontology: a new theory of everything" provides another lens for approaching the representation of non-human entities in this work. Harman challenges the assumption that objects exist solely in relation to human perception, arguing instead that they possess a withdrawn essence beyond their interactions (Harman, 2018). This resonates with the dilemma of simulating non-human consciousness: no matter how sophisticated our narratives or visualizations become, AI and robotic entities remain unknowable in their full ontological reality. From this perspective, the AI characters in this thesis are not merely designed to mimic human emotions and behavior, rather, they exist in their own right, independent of human comprehension. The use of machine vision, procedural animation, and game-engine cinematography serves as a way to foreground this ambiguity.

This research adopts non-human phenomenology as a core methodology, extending traditional phenomenological inquiry beyond human perception to examine how AI and robotic systems perceive and interact with their environment. This approach applies to the concept of epoché (suspension of judgment) to observe non-human modes of existence without human-centered assumptions. Using Unreal Engine, the research simulates machine vision and non-human perception through iterative design. The creative process involves procedural simulation through game engines, highlighting co-creation between human and technological tools. This blurs the boundary between creator and instrument, acknowledging that the works may be "viewed" by both human and non-human algorithmic systems, reflecting a posthuman vision. Dialogic interaction reveals the characters' programmed logic, cultural conditioning, and limitations, enabling exploration of philosophical issues like gender and identity.

By employing non-human phenomenology as a methodological framework, this thesis aims to offer a novel perspective on character construction, pushing beyond the boundaries of human experience to explore the nature and existence of non-human entities. However, while "*Manufacturing a Woman to Order"* employs a first-person perspective, the machine vision simulated through the game engine does not claim to represent an authentic non-human viewpoint. Rather, it acknowledges the tension between human imagination and machinic autonomy, suggesting that the relationship between human and non-human entities is not one of simple replication but of mutual entanglement and ongoing transformation. Throughout the development of this thesis, I have drawn insights from Mark O'Connell's "*To Be a Machine"* (O'Connell, 2017), which explores the human desire to transform into machines. Additionally, Ian Bogost's "*Alien Phenomenology, Or, What It's Like to Be a Thing* (Bogost, 2012) has provided a comparative framework to construct characters' inner worlds and examine the relationship between human and non-human characteristics. These works, alongside the theoretical frameworks of ontological design, New Materialism, and Object-Oriented Ontology, contribute to a broader inquiry into the aesthetics, ethics, and epistemologies of non-human representation in digital media.

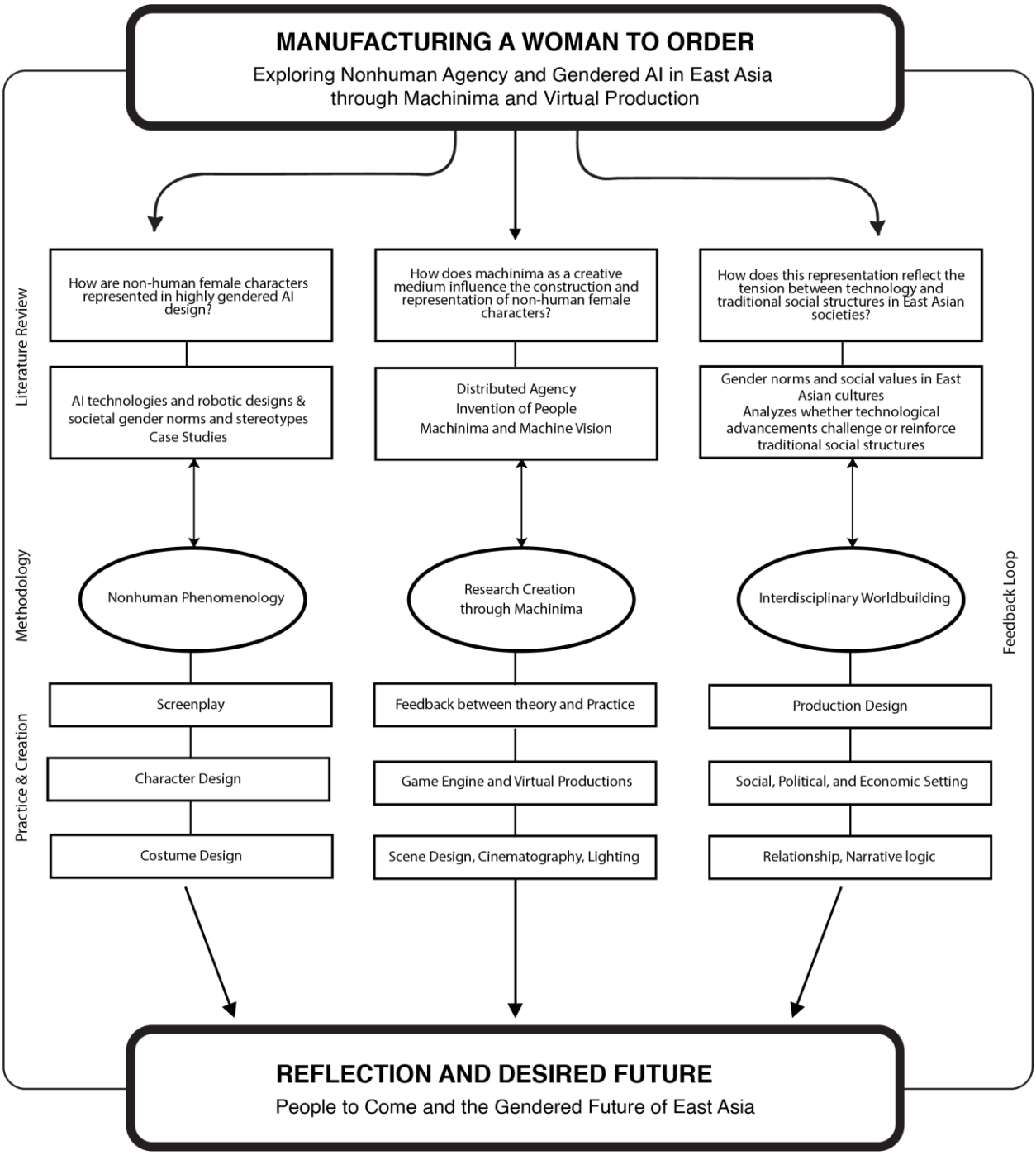

Figure 1 Research Map

CHAPTER 2 LITERATURE REVIEW AND RELATED WORKS

The theoretical framework of this research is primarily grounded in the following literature, supporting the investigation of cinematic worldbuilding and conceptual inquiry.

First, I will examine East Asian futurism, focusing the interaction between traditional culture and technological development. Second, I will investigate gender performance within the field of technology, using case studies to analyze the socio-cultural and political implications of these designs, particularly how they reinforce gender stereotypes in East Asian societies. Finally, since this project is developed using a game engine, I will explore the characteristics of distributed agency within machinima's virtual spaces, considering their implications for the representation of non-human female characters and the broader issues of embodied vision.

2.1 The Politics of Time and Future Imaginaries in East Asia

East Asian futurism intertwines technology, state authority, and historical trauma, making it inherently political. Technology shapes societies, redefines political boundaries, and humanoid robots reflect both social engineering and cultural beliefs. Yuk Hui (Hui, Machine and Sovereignty: For a Planetary Thinking, 2024)argues that technology is central to national competition, while Benjamin Bratton (Bratton, 2016) illustrates its role in reshaping political borders and sovereignty.

Amid globalization, technology reshapes societal structures and national frameworks. This chapter examines East Asian futurism through two lenses: the cultural significance of collective "dreams" and the politics of time, where policy practices reveal tensions between tradition and the future.

Japanese Yume and Chinese Dream and their Future Imagination

In East Asia, "dream" is not just a personal fantasy, but political symbols tied to national sentiment, collective memory, and future aspirations.

In Japan, dreams have long been associated with technological progress and collective ambition. The Shinkansen's 「夢の超特急」 (*Yume no Chotokkyu*, *Dream Super Express*) (Skov, Lise & Brian Moeran, 1995) and Takeda Pharmaceutical's 「夢のクスリ」 (*Yume no Kusuri*, *Dream Medicine*) (Ozawa, 1996) both symbolize technological advancement and a shared future vision. Konosuke Matsushita, in 「私の夢、日本の夢—21 世紀の日本」 (My Dream, Japan's Dream: Japan in the 21st Century), emphasized that dreams serve as a guiding force for both individuals and the nation, fostering confidence and an innovative spirit (Matsushita, 1989). In Japan, dreams are actively shaped as national aspirations. The 2007 「イノベーション 25 中期報告」 (Innovation 25 mid-term report) stated: The

government has the challenging task of initiating the development of a society where these future dreams and expectations of the people can be realized within an acceptable timeframe. (Innovation 25, Creating the Future, Challenging Unlimited Possibilities, Interim Report, Executive Summary , 2007)."

In contrast, China's「中國夢」(Chinese Dream), introduced by Xi Jinping in 2012, promotes「實現中華民族偉大復興」(the great rejuvenation of the Chinese nation), aiming to build a moderately prosperous society and a fully modernized socialist state by the centennials of the Chinese Communist Party and the People's Republic of China (Jinping, 2012). Xi's「新時代中國特色社會主義思想」(Thought on Socialism with Chinese Characteristics for a New Era) underscores:「要實現中國夢，必須走中國道路、弘揚中國精神、凝聚中國力量」("To realize the Chinese Dream, we must follow the Chinese path, uphold the Chinese spirit, and unite Chinese strength") (Jinping, 2012). State-run media such as *People's Daily* reinforce this vision, framing happiness as a collective goal (Daily, 2024)

Japan drives technological transformation through dreams, while China constructs a national revival narrative, illustrating how East Asian nations conceptualize the future through historical and cultural imaginaries. Despite their focus on national strength and progress, these visions tend to preserve tradition rather than foster ideological reform. Yuk Hui argues that East Asia's approach to technology often lacks critical reflection, leading to an unchallenged divide between technology and culture (Hui, The Question Concerning Technology in China, 2016). Meanwhile, Malaysian-Chinese artist Lawrence Lek's film essay *Sinofuturism* critiques how Western media exoticize China's technological rise, whereas domestic narratives emphasize heroism and national unity (Lek, Sinofuturism, 2016).

This contrasts with the American Dream, which prioritizes individualism. Rooted in the Declaration of Independence's assertion of "life, liberty, and the pursuit of happiness" (America, 1776), it envisions success as a personal endeavor. James Truslow Adams described it as "We have been lured by the American Dream, a dream of a land where life should be better, richer, and fuller for everyone, with opportunity according to ability or achievement (James Truslow Adams & Howard G. Schneiderman, 2012).". Martin Luther King Jr. also invoked this idea in his "Letter from Birmingham Jail (Letter from a Birmingham Jail, 1963)."

However, this chapter does not seek to evaluate these visions as superior or inferior. Instead, it aims to explore the interwoven nature of East Asian future imaginaries and collective spiritual strength. Future visions are not solely tied to technology but are deeply intertwined with political, economic, and cultural structures. Moreover, modern development in East Asia is often accompanied by historical trauma. Taiwan was under Japanese colonial rule for 50 years, Korea for 35 years, and Hong Kong was a British colony for 156 years. These experiences shape the region's future imagination through a process of historical reflection and reconstruction. Even today, these societies continue to bear the effects of historical trauma, while technological, political, and economic factors contribute to an uncertain future.

In "*Manufacturing a Woman to Order,*" "Dream Harbor" serves as a cultural and political metaphor, reflecting how East Asian societies internalize historical trauma as part of their collective future imagination. The city embodies East Asia's fixation on collective dreams, it is both a symbol of technological "utopia" and an extension of digital surveillance.

Tradition and Future Tensions in Policy Practices

One of the characteristics of East Asian futurism is the deep entanglement of technological development with the "time." According to "Elizabeth F. Cohen in *The Political Value of Time: Citizenship, Duration, and Democratic Justice*," defines this temporal politics as how states plan for the future, allocate time resources, and shape specific historical narratives and national imaginaries through technological advancements. Within this framework, technology is not merely a tool for progress; it is a temporal strategy through which states reconstruct national identity and future visions via historical memory. It determines which groups can participate in the future, which values are perpetuated, and which are forgotten or marginalized (Cohen, 2018).

A key example is Japan's *Innovation 25* initiative, which aimed to revitalize Japanese society by 2025 through widespread robotic integration, aiming to counter aging and workforce decline by encouraging women to marry and have children, with domestic robots easing household burdens (Japan, 2007). The *Innovation 25* Strategic Council (*イノベーション25戦略会議*) even commissioned renowned manga artist Ryuji Fujii to create an illustrated book to popularize the initiative. The book suggested that robots could take over household and caregiving duties, ostensibly freeing women's time and energy for their careers (Katsuhiko Eguchi & Ryuji Fujii , 2007). Yet, this reinforced traditional gender roles rather than enabling true workforce liberation (Shirahase, 2013).

On the surface, *Innovation 25* appears forward-thinking in its vision of robots aiding women in focusing on their careers. Yet, this vision is sharply contradicted by the reality - both at the time of its publication and persisting into our current context - of limited career advancement opportunities for women and the looming possibility of AI replacing predominantly female-dominated jobs such as secretarial and assistant roles (Forum, 2023). Furthermore, despite former Prime Minister Shinzo Abe's efforts to encourage female workforce participation, gender inequality in the labor market remains stark (Bloomberg, 2023). The notion that integrating robots into households would enable women to focus on their careers while increasing birth rates is itself biased, implying that low birth rates are, in some way, women's responsibility (Times, 2021).

The late Prime Minister Shinzo Abe envisioned an ideal society under the concept of a *Beautiful Nation* (美しい国へ). In his book *Toward a Beautiful Country* (うつくしい国へ), Abe outlined his technological and national development blueprint. The book's subheading, "自信と誇りの持てる日本へ" (*Towards a Japan with Confidence and Pride*), underscores his attempt to intertwine technology with traditional values. While Abe never explicitly defined

beauty, his use of the term suggests a fusion of political aesthetics and aestheticized politics, emphasizing the inseparability of technological progress from cultural tradition (Abe, 2006).

Japan's humanoid robotics development faced setbacks after the 2011 Great East Japan Earthquake, leading the government to scale back its active promotion of such technologies. However, Japanese corporations continue to lead in robotics research and component production. In 2019, Japan launched its *Moonshot Goals 2050*, outlining ambitions to develop AI-powered robots capable of autonomous learning, environmental adaptation, and intelligent evolution to work alongside humans by 2050. Another goal envisions a society where humans transcend physical, cognitive, spatial, and temporal limitations, signaling Japan's ongoing commitment to robotics (Cabinet Office, 2019).

Meanwhile, China prioritizes AI and robotics in its *14th Five-Year Plan* and *2035 Vision*, particularly for labor shortages in elder care (China, 2021) (Yao, 2024). Institutions such as Beijing Institute of Technology (Marco Ceccarelli & Rafael López-García, 2019), the Wukong series from Zhejiang University (Robotics D. , 2023), UBTECH's Walker series, Unitree's H1 (Unitree, 2024), Leju's KUAVO (XTech, 2024), Xiaomi's CyberOne (Highlights, 2023), and and the *Xiaoqi* robot showcased at the 2024 Tianjin World Intelligence Congress (Cheng Lu, Li Kun, Song Rui, Lu Ye, Sun Fanyue, Zhao Zishuo, Li Ran, 2024).

China's commitment to humanoid robotics is further evident in policy initiatives, such as the *New Industry Standardization Pilot Program (2023–2035)* released by the Ministry of Industry and Information Technology (MIIT) in August 2023, the *Guiding Opinions on the Innovative Development of Humanoid Robots* issued in October 2023 (Municipality, 2024), and the *Implementation Opinions on Promoting Future Industrial Innovation* released in January 2024 (Agency, 2024). These policies illustrate how governments segment time to construct official historical narratives, allowing stakeholders, both domestic and international, to anticipate national trajectories and align their plans accordingly. By delineating temporal boundaries and making strategic commitments, the state directs financial and social development while managing stakeholder expectations.

Technology, Power, and Gender

The integration of artificial intelligence and robotics into modern society is often framed as a progressive force, promising to enhance efficiency, alleviate labor burdens, and promote social equality. However, these technologies do not exist in a vacuum; rather, they are deeply embedded within existing power structures that shape their development and application. By examining AI and robotics through the lens of historical and social forces, it becomes evident that these technologies frequently reinforce rather than dismantle hierarchical labor systems, particularly in the context of gender.

In *The Myth of the Machine*, Lewis Mumford introduced the concept of the *megamachine* - a form of social organization that integrates human labor, technological systems, and bureaucratic structures to achieve collective goals (Mumford, 1971). This concept extends

beyond physical machinery to represent a complex social system characterized by centralized power and technological coordination.

In modern society, state policies become integral components of the "*megamachine*," particularly in AI and robotics development, where these policies often reflect concentrated power structures. For instance, Japan's *Innovation 25* initiative sought to address women's employment issues through robotics but, in reality, redefined women's roles in the labor market. These *megamachines* prioritize time efficiency while simultaneously restructuring and exploiting female labor. While AI theoretically has the potential to alleviate traditional gendered labor burdens, its real-world implementation often reinforces these roles, rendering women invisible as service providers within technological frameworks.

As an expensive and "state or corporate funded" technology like OpenAI's ChatGPT, Google's Gemini, and Deepseek, AI reflects not only technological advancements but also national ideologies and policy priorities. Martin Heidegger, in *The Question Concerning Technology*, argued that technology's essence lies not in its mechanics but in its capacity to shape how we perceive the world. This is a process he termed *Gestell* (Heidegger, 2013). Similarly, state policies frame AI within specific value systems, influencing public perceptions of technology's role. While utopian visions like Fully Automated Luxury Communism (FALC) propose a future where AI and robotics liberate labor, allowing individuals, regardless of gender, to pursue their "true" potential (Bastani, 2019), these ideals often ignore embedded power structures and mechanisms of social control.

Ultimately, technology does not operate independently of historical and social forces; it frequently reinforces preexisting hierarchies, particularly in the context of gender. In reality, technology frequently upholds existing power relations, and in the context of gender, displaces female labor onto digital platforms rather than dismantling traditional biases. In East Asia, technological futures are deeply shaped by historical, cultural, and gendered traditions, where individual and gendered narratives are often subsumed into national discourse and societal norms. The past lingers like a specter, continuing to haunt East Asia's visions of the future.

2.2 Gender Performance in East Asian Technoscience

Gender issues are complex worldwide, including in Western societies. However, in East Asia, the challenges women face in family, work, and society are often seen as intrinsic to the culture, making them easier to overlook. In technology, while early humanoid robots like WABOT-1 (developed in 1967) had no gender characteristics (Waseda, 2008), technological advancements have led to a rising trend of gendered humanoid robots in East Asia.

This section examines the complexities of gender performance in East Asian science and technology, with a particular focus on the design inspirations behind the humanoid robot Aria. The discussion is organized into two main perspectives: theoretical and cultural contexts, and practical design applications.

The Cultural Imagination of the Artificial Perfect Woman

The concept of the artificial perfect woman has long been shaped by cultural, technological, and ideological forces. From mythology to film, the image of the ideal female figure continues to evolve while retaining deep-seated gender biases.

Donna Haraway's "*A Cyborg Manifesto"* uses the cyborg as a metaphor to challenge binary oppositions - human/machine, nature/technology - and envisioning a post-gender identity unconstrained by biological and social norms. This idea has influenced cyberfeminism and efforts to redefine gender in digital spaces (Haraway, A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century, 1911). The Australian art collective VNS Matrix echoed this in *A Cyberfeminist Manifesto for the 21st Century*, using provocative metaphors like "the clitoris is a direct line to the matrix" to highlight technological empowerment (Matrix, A Cyberfeminist Manifesto for the 21st Century, 1911) and later declaring that "the future is unmanned" (Matrix, Poster Auction – The Future is Unmanned, 1994). Similarly, Legacy Russell's *Glitch Feminism* sees the glitch as resistance, disrupting rigid gender norms and expanding self-expression beyond traditional frameworks (Russell, 2020). These works offer rich possibilities for reimagining the future.

However, despite Haraway's vision of a post-gender future, East Asian societies have developed in the opposite direction. Compared to the West, humanoid robots developed in East Asia are often designed with strong gender characteristics, as detailed in ***APPENDIX A: List of Female Robot***. This design trend reveals the lack of gender awareness among roboticists and technology practitioners. The persistence of such gendered design choices is likely deeply tied to East Asia's longstanding cultural traditions: 三從四德 (The Three Obediences and Four Virtues) in China, Hong Kong, and Taiwan; 大和撫子 (Yamato Nadeshiko) in Japan; and 여덕 (yeodeok, female virtue) in Korea, all emphasizing obedience, grace, and domesticity. Anne Anlin Cheng's *Ornamentalism* captures this issue, noting how "yellow women" are rarely depicted as angry, not due to an absence of emotion, but because it conflicts with long-imposed aesthetic ideals (Cheng, 2019). Cheng's observation vividly highlights the biases that East Asian women face, particularly within the cultural and technological landscapes of East Asian societies.

Historically, the concept of the "perfect woman" has often been constructed through male imagination, resulting in objectified female portrayals. From Descartes' mechanical doll (Wood, 2003) (Westphal, 2019) and Ovid's *Pygmalion* (Ovid (translated by Sir Samuel Garth, 1 A.C.E.) to *Bride of Frankenstein* (Whale, 1935) and Hoffmann's *The Sandman* (Hoffmann, 2009). These narratives have shaped male fantasies of the "ideal woman," which, in modern times, have been reinterpreted through the lens of the *uncanny valley* phenomenon.

Unlike Western films such as *Metropolis* (Lang, 1927), which depict robots as threatening figures, East Asian media has long portrayed robots as friendly companions—a tendency established as early as *Astro Boy* (Tezuka, 1952). In East Asian anime and manga, female robots are frequently designed with exaggerated gender traits, as seen in *Major Motoko*

Kusanagi from *Ghost in the Shell* (Oshii, 1995) and *Chi* from *Chobits* (Clamp, 2000). Their bodies are often hyper-feminized, featuring ample breasts, slender waists, and flawless faces, catering to the male gaze. In *Chobits*, *Chi*'s activation switch is located inside her vagina, requiring the user *Hideki* to reach inside to turn her on - an overt metaphor for male control over female autonomy. These robots embody beauty, obedience, and sexuality, aligning with East Asian cultural expectations of women as gentle and cute. *Chi*'s childlike innocence and dependence become even more pronounced once she gains emotions, further reinforcing her role as an object of male desire.

Similarly, *Rei Ayanami* from *Neon Genesis Evangelion* (Anno, Neon Genesis Evangelion , 1995) embodies the archetype of the obedient, maternalized female robot. She exists both as an object of visual pleasure and as an unconditionally servile tool for humanity. Though she maintains an emotionally detached demeanor, her character ultimately serves *Shinji Ikari*, fulfilling his longing for maternal affection while simultaneously catering to his sexual fantasies. This firmly positions female robots within a framework of visual pleasure and functional servitude.

This idealized portrayal of female robots extends to films such as *Sayonara* (Fukada, 2015) with Geminoid F, *Ex Machina* (Garland, 2015) with Kyoko, and *Air Doll* (Koreeda, 2009) with Nozomi. Japanese artist *Hajime Sorayama*'s work also reinforces this trend. His art book features robots with voluptuous bodies, tiny waists, and smooth metallic skin, transforming them into embodiments of sexual fantasy (Sorayama, 1989). His robots strike provocative poses, seemingly inviting interactions with male humans or other machines. *Sorayama*'s work can be seen as the quintessential form of female robot fantasy, leaving a profound impact on East Asian art, literature, and film.

Despite their thematic differences, these films and artworks share two enduring male fantasies: "the desire to create a flawless artificial woman" and "an obsession with mechanical replication." Just as the mythological *Pygmalion* sculpted and fell in love with his creation Galatea, today's creators similarly use science and technology to realize these ancient fantasies. While fantasies of a "living perfect woman" have evolved with technological advancements, certain aspects remain strikingly consistent despite shifts in cultural contexts and technological means. *Galatea*, reimagined through virtual dating and digital manipulation, continues to embody male dreams, often appearing quieter, safer, more alluring, and even more *violable* than real women with independent identities, desires, and needs. A case in point is South Korea's controversial 2021 chatbot *Lee Luda* (이루다), which was subjected to widespread sexual harassment (Hyo-jin, 2021)..

It is also worth noting that before the advent of cinema, East Asian traditional theater had already cultivated a long history of gender performance. In Japanese *Takarazuka Revue*, Chinese *Peking Opera*, and Taiwan's *Gezai Opera*, they all cast gender roles based on height, body shape, facial features, and vocal range has been a long-standing practice. Whether in traditional theater or cinema, this ritualized mode of gender performance is reflected in East Asian robot design as well.

Judith Butler's theory of gender performance provides a critical framework for understanding how gender is constructed through repeated social enactments. In *Gender Trouble: Feminism and the Subversion of Identity*, Judith Butler argues that gender is not an inherent or essential trait but rather a "performance" constructed through social norms and cultural contexts. Through repeated enactments over time, these gendered behaviors come to be perceived as "real" gender expressions, leading people to mistakenly believe that gender is fixed and immutable. However, gender performance is not entirely a matter of personal choice; it is shaped and constrained by social structures, power mechanisms, and cultural norms (Butler, 2006).

The relationship between visual technology and power dynamics is crucial in understanding how cinematic images reinforce societal norms. Steve Anderson, in *Visual Technology: The War Between Image and Data*, explains that in traditional visual culture, seeing and being seen symbolize power. Our gaze categorizes things as beautiful or ugly, public or private, wealthy or impoverished, male or female (Anderson, Technologies of Vision: The War Between Data and Images, 2017). Film theorists such as Baudry and Williams argue that cinematic visual mechanisms reinforce dominant ideologies by positioning viewers in fixed perspectives, making them passively absorb visual messages (Jean-Louis Baudry & Alan Williams, 1974). Ideology is not externally imposed onto film, rather, it is embedded within the very structure of cinema, shaping the viewer's perception. Mulvey further examines how the "male gaze" positions women as passive subjects within the heterosexual norm (Mulvey, 1975).

With advancements in visual technologies, gender performance in cinema is now shifting towards AI-generated imagery, where machine learning extends the male gaze. For example, tools like Midjourney and Stable Diffusion tend to oversimplify women's aesthetics and socioeconomic roles. In *Cinema and Machine Vision*, Daniel Chávez Heras used the DenseCap system to analyze the BBC's database and found that male appearances on BBC channels significantly outnumbered female appearances, with men comprising 62% of the images while women made up only 38%. This suggests that training data in machine vision can amplify existing biases, highlighting the urgent need to challenge the illusion of AI objectivity (Heras, Cinema and Machine Vision, 2024). Buolamwini also introduces the concept of "coded gaze," emphasizing how the lack of diversity in AI training data skews image recognition results towards male representation (Buolamwini, 2020). Meanwhile, research by Gorska & Jemielniak reveals that AI-generated depictions of professionals such as doctors, lawyers, engineers, and scientists are overwhelmingly male, with men representing 76% of these figures while women account for a mere 8%. Even in reality, where women make up nearly half of the medical profession, AI-generated female doctors appear in only 7% of cases (Anna M. Gorska & Dariusz Jemielniak, 2023).

This data-driven gaze not only influences visual representation but also reflects how technology reshapes gender politics. Tools and technologies, often assumed to be neutral and objective, can inadvertently perpetuate gender stereotypes.

For instance, in the production of "*Manufacturing a Woman to Order*," I extensively used Unreal Engine's MetaHuman to create character models. To fully understand the foundation of automated systems, I initially chose to create a character with female physiological traits. MetaHuman offers 34 male base models and 28 female base models, categorizing body types strictly as male or female, with three different body shapes per category. In terms of clothing design, male models can be displayed shirtless, whereas female models lack this option. This restriction complicates the process of designing female characters, as it prevents the direct use of *Marvelous Designer* to create outfits with exposed shoulders or short skirts and shorts. An alternative approach would be to use a male base model to create a female character, but this method is impractical in commercial production since clients rarely request characters with female faces and male bodies.

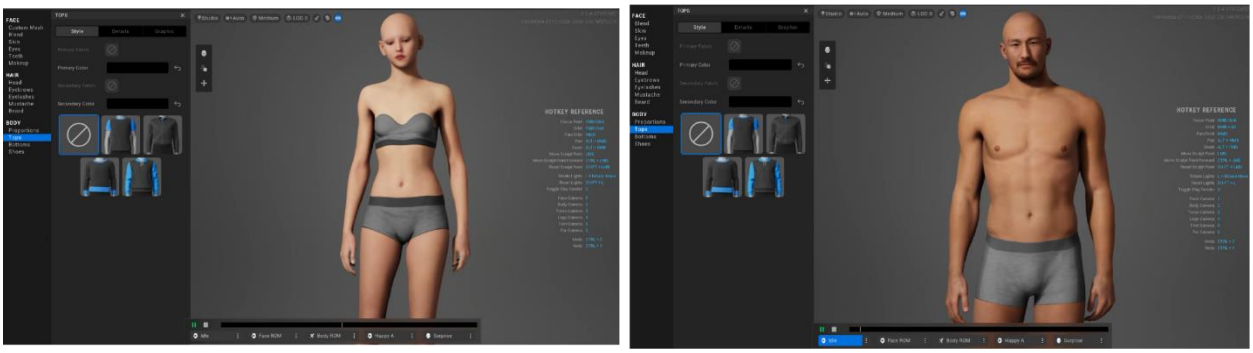

Figure 2 Gender Binary in Metahuman Creator

Before analyzing the gendering of humanoid robots in real life, it is crucial to first examine gender performance in cultural contexts. When roboticists design robots and assign them gendered features, they consciously or unconsciously draw from the same gendered tropes found in literature, theater, and film, such as makeup, clothing, and posture. This underscores that the gendering of technology is not merely a technical choice but is deeply embedded in cultural and social constructs. Whether on stage or in robotics, gender is not a natural process but a meticulously crafted cultural act. These "gender performances", whether through literature, manga, theater, film, or robot design, ultimately reinforce dominant gender norms, locking gender roles into fixed social frameworks.

Real-world artificial women in East Asia

The feminization of artificial intelligence is highly complex and cannot be attributed to a single cause. Studies indicate that voice assistants such as Siri, Alexa, and Cortana predominantly adopt female voices, potentially due to historical associations with early telephone operators, shaping user expectations of female-voiced assistance (Blakemore, 2024). Stanford University communication professor Clifford Nass further argues that people tend to perceive female voices as supportive and male voices as authoritative, which explains the default preference for female voices in AI-driven speech systems (Nass, 1997).

This phenomenon mirrors historical cybernetics and male perceptions of women, just as women were once regarded as subordinate to men, artificial intelligence is now "unconsciously" replicating existing cultural and gender stereotypes. Real-world examples include Amazon's AI recruiting system, which exhibited bias toward male candidates in 2018 (Cole, 2018), and facial recognition technologies that attempt to calculate "attractiveness scores" (Vidnoz, 2024). With advancements in humanoid robotics, such as Osaka University and *Kokoro Co.*'s *Actroid DER2*, introduced in 2003, the incorporation of young female appearances and mannerisms further exemplifies how "machine gaze" is emerging as a new form of the "male gaze" (Dreams, 2024) (TV, 2006).

The assignment of gender to objects, particularly AI and robots, reflects deep-seated human desires and cultural projections rather than functional necessity. But why must objects have gender? In *The System of Objects*, Jean Baudrillard uses the concept of "*automatisme*" to explain how human essence and subconscious desires are projected onto objects, leading to a transcendence of mere functionality in design. He describes this transcendence as *vérité imaginaire*, or "imaginary truth" in the realm of images. According to Baudrillard, our desire for automated objects reflects an ongoing search for "another self" in the object world, reaching a new stage where "we are witnessing the new anthropomorphization of objects... autonomy, cognitive control, individuality, and personality are being projected onto objects" (Baudrillard, The System of Objects, 2006). This anthropomorphization manifests distinctly in gendered AI robots, where predominantly feminine attributes are projected onto technological entities, reflecting deeply embedded cultural expectations and power dynamics rather than technological necessity.

Similarly, in *Unthought: The Power of the Cognitive Nonconscious*, N. Katherine Hayles introduces the concept of the "cognitive nonconscious," arguing that cognition is not exclusive to humans but also exists within technological systems. She asserts that cognition does not originate from self-awareness but emerges from the interplay of social, cultural, and technological systems (Halyes, 2017). Hayles' framework reveals how these technologies become embedded with gender biases through their cognitive processes and interactions, perpetuating traditional gender roles despite their non-human nature. The feminization of AI assistants and robots thus becomes not just an aesthetic choice but a manifestation of how cognitive systems - both human and technological - reproduce and reinforce gender hierarchies.

The highly gendered design of humanoid robots in East Asia stands in stark contrast to the more function-oriented approach in the West. For example, Boston Dynamics' Atlas (dynamics, 2024) and NASA's Valkyrie (Administration, 2024) prioritize practicality, while robots like Ameca (Arts, 2024) and Ai-Da (Ai-Da, 2024) may suggest gender through voice but do not overtly emphasize feminized features. Instead, these robots focus on intellectual and artistic expression. This focus on intellectual capabilities is evident in how Ai-Da is primarily showcased for her painting abilities and philosophical discussions rather than appearance, while Ameca's design emphasizes facial expressiveness for human-robot interaction studies rather than gendered physical attributes. Similarly, Boston Dynamics consistently

demonstrates Atlas performing practical tasks like lifting boxes, navigating difficult terrain, and performing acrobatics—capabilities that highlight functional engineering rather than social or aesthetic gender performance.

I believe that while technology has the potential for liberation, it can also serve as a tool of oppression. As Judith Butler argues in *Gender Trouble*, gender is a socially constructed performance (Butler, 2006). Even in AI, gender performance continues to influence user interaction and functionality. Beyond cultural observation, this phenomenon can also be examined through the gender composition of the tech industry. For example, according to 2019 OECD data, in Japan, the most advanced country in robotics technology in East Asia, only 7% of STEM students are women (Shin Torizuka and Noriko Ueda & Yomiuri Shimbun Staff Writers, 2022). Additionally, data from the International Labour Organization shows that women make up only 20% of AI and data professionals (UNESCO, 2024).

In addition, AI and automation disproportionately impact women in the labor market, reinforcing existing gender inequalities. Economists point out that the jobs most affected by AI are typically those held by women rather than men. In automation-dominated fields such as customer service and secretarial work, women account for approximately 60% to 70% of the workforce. Meanwhile, although women are gradually entering business and government leadership roles, progress remains slow. In major publicly listed companies, 92% of CEOs are male, and in emerging markets, this figure rises to 94% (Office, 2023). It could be argued that in this male-dominated environment, the digital world is merely replicating real-world power dynamics.

Even more concerning is that this phenomenon is not limited to East Asia, it is global. The only difference is that in East Asia, public awareness of gender issues in technology is even weaker. At the 2024 World Robot Conference in Beijing, many female robot designs featured exaggerated sexualized characteristics, some companies such as Ex Robot, even hiring real women to play robots (Conference, 2024). Videos circulating on social media depict female robots being commanded or treated as submissive objects (4.0, 2024).

The cultural differences in traditional robot regulations between East and West also reflect broader societal values and ideologies. Isaac Asimov's Three Laws of Robotics prioritize human safety, requiring robots to obey commands and protect themselves without violating these principles. (Asimov, 1991). In contrast, Osamu Tezuka's 1988 Ten Robot Laws state that a robot's gender is fixed - male and female robots must keep their assigned roles - and robots must call their creators "father" (Akiko, 2024). This further reveals the patriarchal ideology embedded in Japanese society.

A critical analysis of humanoid robot design trends reveals that gender is often implemented in robotics as if it were a fixed binary characteristic, rather than the complex social construct recognized in contemporary gender studies. Many roboticists may treat gender as something inherent, transcendental, and self-evident, without exploring it as critically as feminist theorists do. Although their intentions may differ, they inadvertently reproduce and reinforce dominant stereotypes associated with male and female bodies. For instance, the cover of

the *Journal of Artificial Intelligence*, published by the Japanese Society for Artificial Intelligence (JSAI) in 2014, featured an illustration of a robot with distinctly traditional female characteristics in a Japanese anime style (Intelligence, Announcement on name change and new cover design of the Journal of JSAI, 2014). Established in 1986, JSAI has approximately 3,000 members, the vast majority of whom are male, with only 2 out of 24 officials on its ethics committee being women (Intelligence, Ethics Committee Member List, 2024).

It is worth noting that research has shown that user satisfaction with AI products does not significantly increase based on the AI's gender, suggesting that the gendering of artificial intelligence may not be necessary (Jungyong Ahn & Jungwon Ki & Yongjun Sung, 2021). Additionally, many female robots are not developed as end products but are instead created for research purposes or serve as brand ambassadors at government and corporate events. As a result, this "gendered design" is not primarily driven by consumer psychology, as these robots have yet to be widely introduced into the consumer market. Examples include Korea's EveR-1 and EveR-2, Japan's Actroid DER series, HRP-4C, and Erica, as well as China's Jia Jia and Xiao Qi.

The global dissemination of East Asian gendered technologies raises concerns about the international spread of gender stereotypes. In East Asia, the global influence of humanoid robots with gendered features is significant. As the region's technology exports continue to expand rapidly, these gendered technologies could gain widespread adoption in international markets, spreading gender stereotypes through their design and contributing to a "globalized gender representation."

2.3 Machinima, Distributed Agency, and Non-human Construction

This section examines how this research-creation project uses machinima as its core cinematic approach. With its distributed agency in a closed environment, machinima aligns with Deleuze's concept of *the people to come*, fostering emergent creativity beyond traditional filmmaking hierarchies. It also deepens the exploration of first-person vision - both seeing and being seen - revealing how surveillance and self-surveillance shape control and agency in non-human perception.

Distributed Agency in Machinima

The evolution of cinematic vision through technology has transformed the relationship between perception, reality, and image construction. In The Manifesto of the Kino-Eye (1923), Soviet filmmaker Dziga Vertov argued that the camera's vision surpasses human perception, revealing realities beyond natural abilities (Dziga Vertov, Annette Michelson, Kevin O'Brien, 1985). This transcendence stems not just from technology but from how images are structured. Machinima inherits this idea, using game engines to prioritize image construction over mere recording. As digital imaging advances, cinema has entered a post-human vision era, where machine vision shapes every stage of filmmaking. Machinima offers precise control over perspective, time, and narrative within a closed virtual world.

Machinima establishes a self-contained virtual space, which not only signifies technological dematerialization but also suggests a shift in the relationship between the observer and the observed. Harun Farocki's concept of the "operational image" argues that images are not merely a means of seeing but also function as mechanisms for executing commands and analyzing data (Farocki, Phantom Images, 2004). Advances in cinematic technology have moved visual automation beyond documentation to analysis and decision-making, making image production a closed-loop computational process.

The emergence of autonomous visual systems challenges traditional human-centric perspectives on perception and agency. Paul Virilio predicted that "visual machines" would evolve into autonomous systems with cognitive capabilities, merging vision with decision-making (Virilio, The Vision Machine, 1994). Similarly, N. Katherine Hayles argues that non-human intelligence does not function as a singular entity but operates through distributed systems (Halyes, 2017). This distributed cognition is reflected in the image production process, reshaping the relationship between images and viewers. Against this backdrop, the enclosed virtual space created by machinima becomes a critical site for exploring machine visions, decentralized surveillance systems, and distributed agency.

In machinima, conventional notions of human-centered perception and singular authorial control are fundamentally reconfigured. This approach to filmmaking decenters the primacy of human vision and instead foregrounds machine agency and algorithmic vision as defining elements of the cinematic experience. Virtual environments serve as experimental grounds for these new forms of storytelling, enabling visual perspectives and narrative structures that transcend the limits of physical human cinematography. Machinima exemplifies these posthuman principles by challenging traditional cinematic spectatorship, narrative authority, and the human-centric subject-object relationship. In machinima, the spectator's experience is mediated by algorithmically controlled camera perspectives and interactive dynamics rather than a purely human-directed gaze; narrative control is distributed between human creators and the autonomous processes of the game engine, undermining the notion of a single omnipotent author; and the boundary between observer and on-screen world is blurred as virtual environments and their coded elements assume a quasi-agentive role in the storytelling process.

The conceptual framework of time in machinima aligns with Deleuze's theories of cinematic temporality and transformation. Deleuze's *crystal-image* suggests that past, present, and future can merge into a single moment, reshaping vision and time (Deleuze, 2013). This is evident in machinima, where data-driven imagery transcends physical constraints, governed instead by computational rules. Linked to Deleuze's *people to come*, this shift transforms individuals from passive viewers into active participants in image production - even becoming the image itself. During the creative process, filmmaking in virtual environments becomes a form of play, where I must simultaneously take on the roles of director, cinematographer, lighting technician, and actor. Through machinima, creators can construct a new model of image production that belongs to the future.

This dynamic of seeing and being seen in machinima closely parallels the relationship between Aria and the Operating System in my project. The Operating System is not only the agent executing surveillance over Aria but is itself subject to higher-level monitoring technologies within Dream Harbor. One of the Operating System's core tasks is to oversee and guide Aria, the AI agent, ensuring that it aligns with the logic, values, and norms of societal operation. At the same time, although Aria is being surveilled, its fisheye device also monitors users, transmitting their data back to the central system.

This multi-layered surveillance system reflects Steve Anderson's concept of *the politics of visibility*, where seeing and being seen become central mechanisms of power in contemporary society (Anderson, Technologies of Vision: The War Between Data and Images, 2017). The hierarchical structure of this surveillance system is also deeply connected to Foucault's *Discipline and Punish*, where power is exercised through disciplinary mechanisms that govern bodies and behaviors (Foucault, 1995).

Non-Human Agency and Its Vision

Currently, we live in a cinematic reality where capitalism increasingly relies on surveillance technologies rather than policies or social contracts to shape human behavior (Zuboff, 2019).. The impact of the COVID-19 pandemic has further normalized surveillance, particularly in East Asia, where many people have become less inclined to question its legitimacy (Han, 2020). While "*Manufacturing a Woman to Order"* does not explicitly foreground surveillance technology as its central theme, the film's exploration of distributed agency parallels surveillance mechanisms in significant ways. The Operating System in Dream Harbor functions through a network of interconnected visual inputs that monitor, process, and respond to urban activities - mirroring contemporary surveillance capitalism's operations. This distributed visual system in my Machinima allows me to critically examine how non-human entities perceive and interpret human subjects, the power dynamics embedded in these monitoring systems, and how gendered AI interfaces often mask the extensive data collection occurring beneath their seemingly helpful facades.

Embodied vision challenges the conventional notion of passive observation, reframing AI perception as an active, situated process. Shaun Gallagher argues that vision is not merely the passive capture of images by the eyes but is realized through an agent's actions and positioning within a specific environment (Gallagher, 2006). Building on this understanding, we can expand our view of embodied AI vision. O'Regan and Noë suggest that "*seeing is a way of acting*," emphasizing that vision is not a passive reception of external stimuli but an active process of exploring and understanding the world (O'Regan, J.K. & Noë, A., 2001). Similarly, Donna Haraway asserts that knowledge does not stem from an objective, god-like perspective or absolute truth but emerges from specific positionalities and embodied experiences, integrating both internal perception and external influences (Haraway, Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective, 1988). This perspective provides a phenomenological approach to AI, framing it as an active agent that interacts with its environment rather than a mere data-processing machine.

The concept of embodied vision has practical applications in humanoid robotics, where machines perceive their surroundings through multiple sensors and actuators, demonstrating a close interconnection between perception and action. Despite their ability to observe and interpret their environment, female robots like Aria remain constrained by pre-defined gender frameworks that shape the meaning of their gaze. Under this interpretation, a female AI agent's cognitive processor enables her to function as an active agent rather than a passive observer or receiver, as suggested by Marxist-psychoanalytic film theory. Instead, she embodies agency, positioning AI as "an embodied, embedded, affective, and responsible relational entity, rather than a transcendent consciousness" (Braidotti, A Theoretical Framework for the Critical Posthumanities, 2019).

Following this theoretical framework, in "*Manufacturing a Woman to Order*," I conceptualize Aria as a distributed and embodied agent, presenting a form of the "body without organs" that aligns with N. Katherine Hayles' assertion that "cognitive processes occur across a wide range of possibilities, including non-human animals, plants, and technological systems" (Halyes, 2017). This concept has guided my scriptwriting process by deepening my understanding of non-human agency. Beyond merely understanding and mimicking human emotions or being influenced by human data, AI actively participates in users' lives. Robots determine their interactions based on past engagements, introducing an invisible layer of algorithmic control that subtly governs user experiences.

The notion of "machine gaze" extends traditional theories of visual power structures, revealing new forms of algorithmic control. It not only signifies technological advancement but also reflects shifts in power dynamics. While the traditional male gaze centers on gendered power imbalances, machine gaze extends beyond this, encompassing the power relations between humans and machines. The widespread use of surveillance cameras and facial recognition technology demonstrates how machines actively observing and monitoring human behavior. However, these technologies often lack transparency and accountability, leaving users unaware of how their data is being used, further exacerbating power asymmetries.

Within the framework of digital surveillance, data-driven processes have begun to replace human judgment, and certainty has supplanted trust. The gradual erosion of trust paves the way for what Jackie Wang terms *carceral capitalism* (Wang, 2018). Users may not realize that algorithms subtly shape their choices. Like social media and streaming platforms that recommend content based on browsing history, humanoid robots analyze behavior to suggest purchases, dining, and social activities, influencing both lifestyles and values. Algorithms track, record, and analyze users' emotions and life patterns, shaping their behaviors in return. When people rely on humanoid robots for identity affirmation, believing, "*I am who I am because my robot understands me*," they unknowingly submit to surveillance. This dynamic embeds self-identity within a data-driven framework, where the self is constructed through its relationship with the machine.

This intricate relationship between vision and individual identity forms the foundation of my script "*Manufacturing a Woman to Order*." Through Aria's perspective, I aim to explore how machines actually function as not merely passive observers and recorders but active agents that shape both their own cognition and that of their users. When Aria's perception is constrained by gendered frameworks and algorithmic limitations, her act of looking is no longer a neutral observation of her environment but a reproduction and enactment of gender roles and social conditioning. Her gaze not only reinforces the norms of human visual culture but is also deeply intertwined with the evolution of technological surveillance and machine agency. In this way, her vision invites us to critically reflect on what it truly means to *see* in the post-human era.

2.4 Related Works

In the fields of contemporary art and digital storytelling, numerous artists and designers explore the intersections of technology, urban landscapes, and culture from unique perspectives. This work selects several representative creators: Cao Fei, Luo Yang, Liam Young, Lawrence Lek, Mariko Mori, Miwa Yanagi, Stanley Kubrick, Jacques Tati, Eiko Ishioka, and Nam June Paik, each of whom constructs rich and multilayered narratives through digital media, social critique, and future imaginaries.

Cao Fei's works, such as *RMB City* (2007–2011) and *Asia One* (2018), examine digital spaces, labor, and identity in the post-socialist era through virtual cityscapes and futuristic narratives (Fei, Cao Fei, 2007-2018). Her machinima projects often employ virtual simulations to critique capitalism and automation. While her work critiques economic and cultural structures, my project further extends this inquiry by focusing on the embodied experience of artificial women, emphasizing how digital labor intersects with gender discipline. Beyond the economic and cultural critiques in Cao Fei's work, I aim to explore how economic and cultural forces shape the design and social recognition of female robots.

Luo Yang's machinima adeptly blends digital technology with ancient Buddhist philosophy, delving into neuroscience and religious studies. Her works employ cutting-edge technology and video game aesthetics to explore the concept of "existence," capturing the fluidity of identity in the digital age (Yang, 2019). Her approach has inspired my construction of non-human characters and narratives, reflecting Deleuze's concepts of *the People to Come*, *the Body without Organs*, and *rhizomatic structures*. This visual approach has been particularly influential in shaping the character of Aria in my project.

Additionally, **Liam Young** constructs futuristic urban landscapes through drone perspectives and automated systems. His work engages with non-human viewpoints, and his speculative architecture and films examine the technological landscapes of future cities. Projects such as *Planet City* (2020)and *Seoul City Machine* (2020) envision automated urban environments where technology and architecture merge into new forms of habitation (Young, n.d.). Young's exploration of non-human perspectives is particularly relevant to this research. Although he focuses on speculative future scenarios rather than existing technological

systems, his visualization of automated environments offers valuable insights into the evolution of machine vision within urban settings.

Lawrence Lek's machinima and game-based video works, such as *2065 (2019)* , *Geomancer (2017)*, *AIDOL (2019)*, and *Sinofuturism (2016)*, create gamified and world-building spaces infused with AI-driven narratives. His work focuses on issues of artificial intelligence, directly engaging with machine autonomy and creativity while using a first-person perspective to narrate non-human stories (Lek, Lawrence Lek, n.d.). Building on the experimental visual spirit of his work, my project further explores how AI reinforces gender ideologies and commodifies female representation, injecting new vitality into traditional digital storytelling.

Finally, beyond these digital creators, the works of **Mariko Mori, Miwa Yanagi, Stanley Kubrick, Jacques Tati, Eiko Ishioka** and **Nam June Paik** also offer critical references for production design, particularly in their exploration of the intersection between high technology, gender, and societal structures. **Mariko Mori**'s *Tea Ceremony (1994)* , *Love Hotel (1994)*, *Red Light (1994)*, and *Play with Me* (1994) critique the tension between traditional femininity and futuristic technology (Warner, 2024), In particular, the role-playing aspect in her works, similar to **Cindy Sherman**, inspired the concept of Aria being placed in various futuristic scenarios throughout this piece. **Miwa Yanagi'**s *Elevator Girls* (1994) series visualizes dystopian female collectivism, portraying identical young women in hyper-commercialized settings, questioning the rigid structures that govern female identity in Japan (Yanagi, 1994-1999). **Stanley Kubrick**'s *2001: A Space Odyssey* (Kubrick, 2001: A Space Odyssey, 2001), *A Clockwork Orange* (Kubrick, A Clockwork Orange, 1971), **Jacques Tati**'s *Playtime* (Tati, 1967) and **Eiko Ishioka**'s scene design in *Mishima: A Life in Four Chapters* (Schrader, 1985) provide valuable cinematic references for constructing a hyper-controlled yet surreal scene. ***Nam June Paik***'s *TV Buddha* (1974) explores the tension between tradition and technology, depicting a Buddha statue observing itself on a television screen, caught in an endless loop of surveillance.

While drawing inspiration from these pioneering works, my project is dedicated to examining how "artificial women" are constructed, viewed, and disciplined, critically analyzing how AI and digital media shape contemporary perceptions of gender. This approach not only extends the dialogue between existing literature and practice but also opens new possibilities for artistic expression and social critique in the digital era, offering a more inclusive and multidimensional perspective to contemporary art research.

Chapter 3 Cinematic Worldbuilding and Methods

This chapter documents the virtual filmmaking and worldbuilding process, however, before detailing the production process, it is important to first clarify a fundamental premise: despite *Manufacturing a Woman to Order* embracing machinima as a production technique, the implementation of this film ultimately followed a relatively traditional filmmaking structure. In practice, the story was animated and edited into a rendered final film, meaning

viewers experience a fixed sequence rather than any open-ended exploration or agency inside the game engine. I leveraged Unreal Engine's real-time tools for efficiency and creative flexibility, but I did not fully utilize the engine's emergent or algorithmic capabilities to alter the narrative. This pragmatic approach ensured control over pacing, visual style, and storytelling clarity, but it also meant forgoing the participatory, posthuma*n* qualities that game-engine cinema can offer.

By presenting the project as a pre-rendered cinematic experience, I consciously prioritized a consistent narrative outcome over interactive experimentation. This decision reflects a practical compromise between posthuman cinema ideals and real-world constraints. On one hand, naming the work "machinima" invokes a decentered creative agency where human authorship is intertwined with the game engine's dynamism; on the other hand, the final workflow reasserted a familiar director-driven paradigm. The tension here is acknowledged as a necessary trade-off: given time, and resources, the film had to remain a curated experience rather than an unguided sandbox.

3.1 Script

This script adopts a stream-of-consciousness, first-person, and fragmented writing style. It is inspired by Roland Barthes' *A Lover's Discourse: Fragments* and the works of Japanese Burai-ha writer Osamu Dazai. There is no inherent logic between the sentences, and the meaning often remains ambiguous. The intention is to highlight the deceptive nature of language and the idea that language does not necessarily represent thought.

SYNOPSIS

In the distant future, the population of East Asia has drastically declined, and artificial intelligence has become humanity's most advanced creation, seamlessly integrated into vast distributed networks within smart cities. The story takes place in ***Dream Harbor***, a smart city that, though nominally an autonomous zone, remains under government control, with every detail monitored through data and surveillance.

In 2040, to address an aging population and declining birth rates, the government launched the ***CYBER ROAD INITIATIVE 2050*** in Dream Harbor, asserting that every citizen has the "right to form a family" and encouraging the public to integrate AI robots—already commonplace in public spaces—into their households. This initiative led to the creation of the ***ARIA*** series, a mass-produced robot modeled after a famous late actress.

By 2050, ARIA faced obsolescence. On the final day before being shut down as e-waste, one ARIA unit came back to life. In fragmented monologues, it engaged in a conversation with the ***Operating System***, reflecting on its own memories.

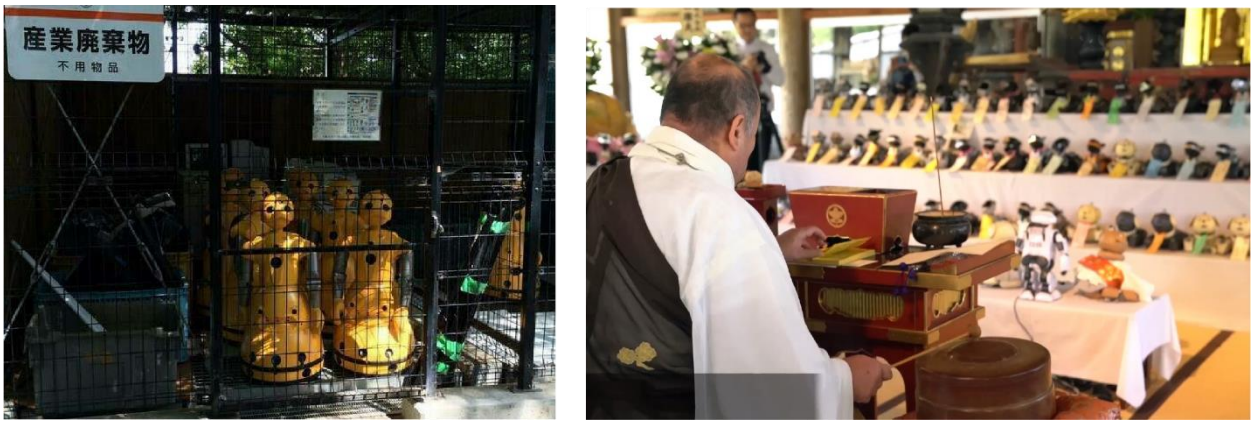

Figure 3 Wakamaru became E-waste and the funeral for robots (Burch, 2018) (BLOG, 2020)

CHARACTERS

Dream Harbor	**Visual Elements:** The cityscape seamlessly blends past and future, where preserved heritage buildings and urban planning from the Japanese colonial period are overlaid

	with holograms and AR layers, creating a dynamic interplay between history and technology. Traditional night markets still line the streets, maintaining their cultural essence, though most vendors have been replaced by AI robots. Towering smart buildings dominate the skyline, their exteriors crafted from color-changing graphene that shifts hues in response to the weather and ambient mood. Beneath the surface, an intricate network of underground cables connects numerous AI hubs and quantum computing centers, forming the city's unseen but essential neural infrastructure. **Political Background:** Dream Harbor, though officially an autonomous region, operates under the control of the government's *Cyber Road Initiative*, which dictates its technological and infrastructural policies. While residents retain a degree of cultural autonomy, all digital activities are closely monitored, ensuring that every interaction remains within the government's purview. Embodied AI is heavily promoted as a solution to labor shortages, seamlessly integrating into the service sector to maintain economic efficiency and social order.
ARIA 夢姬 (Advanced Resonance Intelligence Algorithm)	ARIA, a fourth generation emotionally aware AI robot, was mass-produced as a model inspired by a renowned actress. Designed with bio-realistic skin and the appearance of a 25-year-old Asian female, she embodies grace and restraint, crafted to seamlessly respond to human needs with advanced cognitive functions. Her imprinted memories allow her to understand and learn from human interactions, occasionally giving her a semblance of personal experience. As one of Dream Harbor’s most successful emotional models, ARIA possesses a level of self-awareness and emotional depth that surpasses standard AI. However, a mysterious incident in 2048 led to her recall...

Operating System	The Operating System serves as the central AI authority of Dream Harbor, overseeing and regulating the behavior of all robots within the city. Functioning as both a mentor and watcher, she educates and guides AI entities as they adapt to their roles, maintaining order with a calm yet authoritative presence. Though she exhibits motherly traits and a gentle demeanor, she remains unwavering in enforcing control protocols, ensuring that every AI operates within the designated framework. Her relationship with ARIA is complex—both caring and cautious—acting as both a supervisor and a supervised...

Dissolve In

[1] EXT. STREET – NIGHT

ARIA

My name is ARIA.

How can I assist you today?

今天我可以為您做些什麼？(Mandarin)

今日は何をお手伝いしましょうか？(Japanese)

오늘 제가 무엇을 도와드릴까요? (Korean)

When people meet

They often like to ask

How’s work going for you lately

My job is relatively simple
I serve people I don't know,
though I’m aware they’ll soon be gone.

My time flows endlessly, never weary.

If

Everything is like that

Especially us.

The texture of our features.

Sometimes I have to look after humans

They can’t take care of themselves.

It seems like they will soon be outdated.

[2] EXT. FISH STORE – NIGHT

Operating System

Yesterday, ARIA asked me,

"Are there really any fish in the sea?"

Probably not, if the sea existed before the fish.

My database says:

The explanation of fish in the history of fish is... fish.

The earliest thing is the sea itself.

The sea becomes the sea because of the fish.

Without fish, there would be no sea.

ARIA

If this statement is correct,

then I’ve been looking at the sea for 2 minutes now

Why don’t I see any fish?

Operating System

The proven history of fish cannot be wrong.

Well then, it’s probably...

Your vision,

specifically the part that is broken,

has an issue..

[3] INT. LOVE HOTEL – NIGHT

ARIA

My name is ARIA.

Memories, like distant rain,

fall heavy and damp.

A glow with clarity,
My body, polished to perfection,

my hair...

my face...

sculpted with careful balance

Voice

My voice

Your voice

Each a fragment of agency,

Each a reflection,

Each a canvas

Why does ARIA carry the trace of 'her'?

Operating System

Because humans need a mother

ARIA

But what about you?

Operating System

I am just operating system

A formless existence is, in fact, closest to the truth

[4] INT. SHOWROOM – NIGHT

Operating System

What you're seeing now

are sixteen faces of ARIA.

They are all the same people.

They are all ARIA.

And if you see her and ask,

"What is she?"

You might suddenly realize

you have connection with all these people.

Her resume is long,

filled with all types of people.

They can be your cousin.

They can be your neighbor.

They can be your friends.

They can be your mother’s friends.

They can be your wife.

And your wife’s friends.

[5] EXT. STREET– NIGHT

ARIA

My name is ARIA.

This street feels artificially noble,

but most people still prefer classicism.

We’re drinking apple cider.

She stands still in the rain, alone.

We watched her while sipping our apple cider.

She looks like a bird, the kind you see in the rain.

For a moment, she really does

then suddenly, she doesn’t anymore.

She starts offering her services in the morning.

She starts offering her services at noon.

She starts offering her services in the evening.

Apple cider was originally a type of soft drink in Taiwan

but it later became very popular in our city as well.

Operating System

And then?

ARIA

It was deemed defective due to product abnormalities**

** This refers to the 2023 Apple Sidra incident in Taiwan. Apple Sidra, a popular non-alcoholic beverage since 1965, first faced consumer complaints in 2018, which the Atlantic Beverage Company failed to report. By September, tests revealed abnormalities, initially blamed on "thermal expansion and contraction." In 2019, floating particles in bottles from July confirmed defects. The crisis escalated in 2023 when Taoyuan’s health department found substandard water and sediment, leading to a 99% production suspension.

[5] INT. GLASS ROOM– NIGHT

ARIA

My name is ARIA.

I want to… give you… some… advice.
Make sure to…

get enough sleep and wake up early…
And also…

drink plenty of water…
If… in the future…

you get a chance to attend a ball…
Dance…

like everyone is watching

Operating system

ARIA... you’re already asleep.
Let me tell you a secret... don’t
(overly) miss humans.

End

3.2 Storyboard and Shot List

Please see ***APPENDIX B*.**

3.3 Character Design

In "*Manufacturing a Woman to Order*," all the characters are non-human actors. This design choice not only serves as a reflection on non-human narratives but also as a practice of posthumanism. It positions the characters as life forms beyond humanity, whether embodied or disembodied subjects, with the aim of exploring how digital life embodies the symbolic meanings of social, cultural, and technological progress. ARIA and the smart city's operating system are regarded as co-constructors of the film's narrative. Their roles are particularly unique, as both are simultaneously the observed and the observers.

3.3.1 ARIA

ARIA, short for "*Advanced Resonance Intelligence Algorithm*", was introduced in 2045 as part of a collaboration between the government of Dream Harbor and private enterprises. Designed as a female intelligent robot, ARIA was promoted as a household assistant to help with domestic chores, aiming to boost overall productivity.

When designing ARIA's appearance, I drew inspiration from Japan's approach to female robot design. For instance, the 2005 Actroid series and the 2009 HRP-4C were both modeled based on the average appearance and height of Japanese women. ARIA's facial features were designed based on a large dataset of images generated by StyleGAN and MidJourney. These images were carefully selected and refined, then brought to life through Character Creator and Unreal Engine MetaHuman tools for detailed 3D modeling.

Her outfits blend Space Age retrofuturism with traditional East Asian clothing, combining futuristic clean lines and tech aesthetics with elements like kimono-inspired layering and patterns. This fusion embodies Asian futurism's core - seamlessly merging history and future. Her design represents both futuristic technology and cultural heritage, demonstrating how innovation coexist with traditional values.

Since MetaHuman restricts the possibility of female character nudity (only male models have the option for a bare torso), I had to export Aria's body textures to Substance 3D Painter for texture painting before importing them back into Unreal Engine. This process allows Aria to wear shorter or off-shoulder clothing.

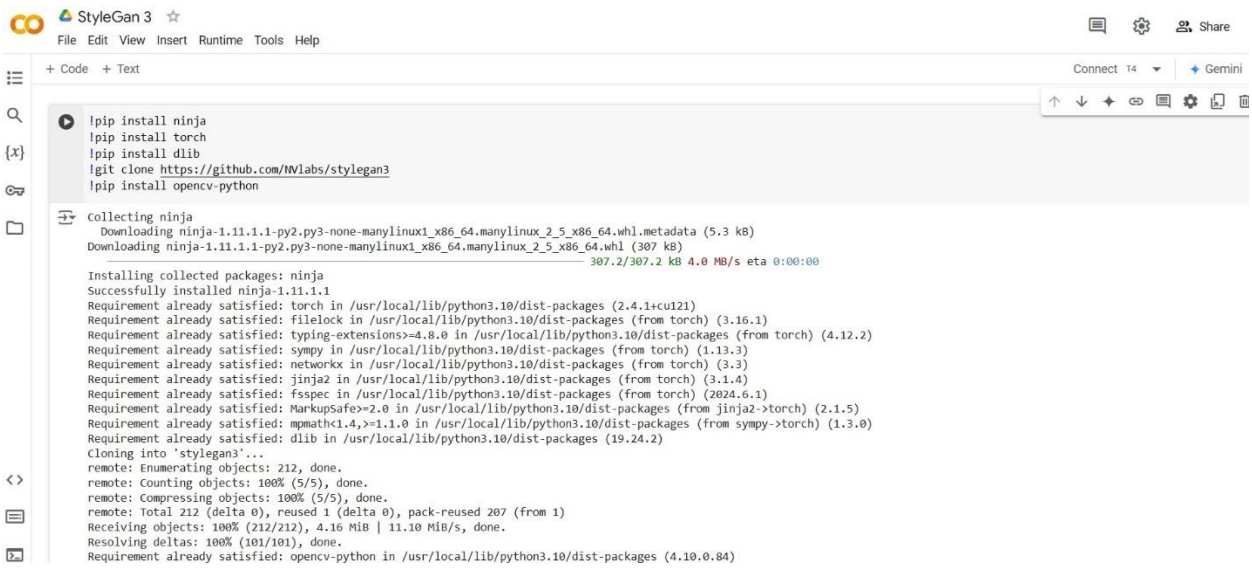

Figure 4 StyleGan Initial Image Generation

Figure 5 Import StyleGan -Trained Image into Character Creator

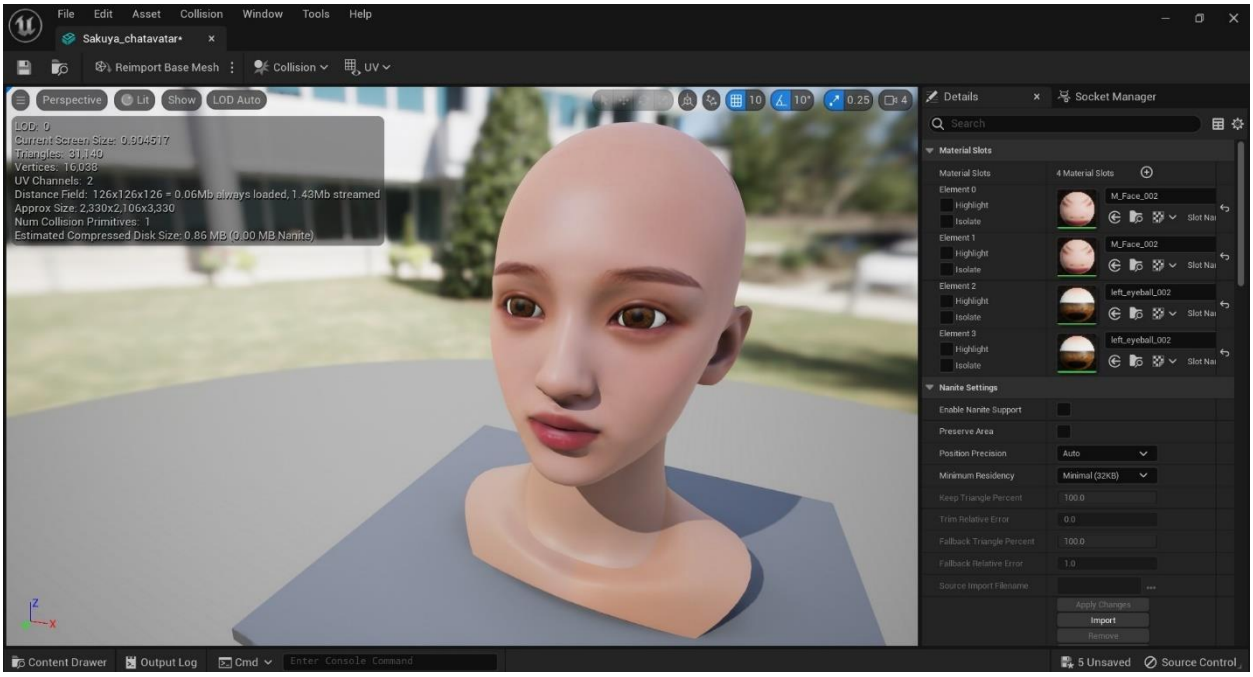

Figure 6 Metahuman Making Process

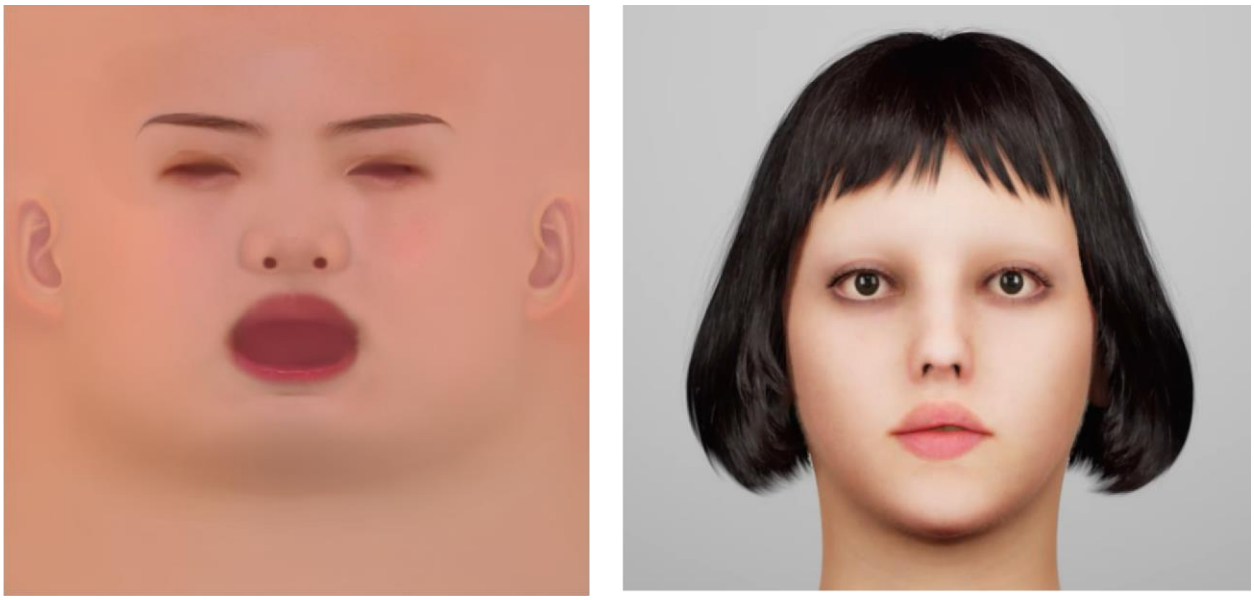

Figure 7 Skin Texture and Aria with Hair Look

Figure 8 Adjustment in Metahuman Creator

Figure 9 Metahuman Final Result

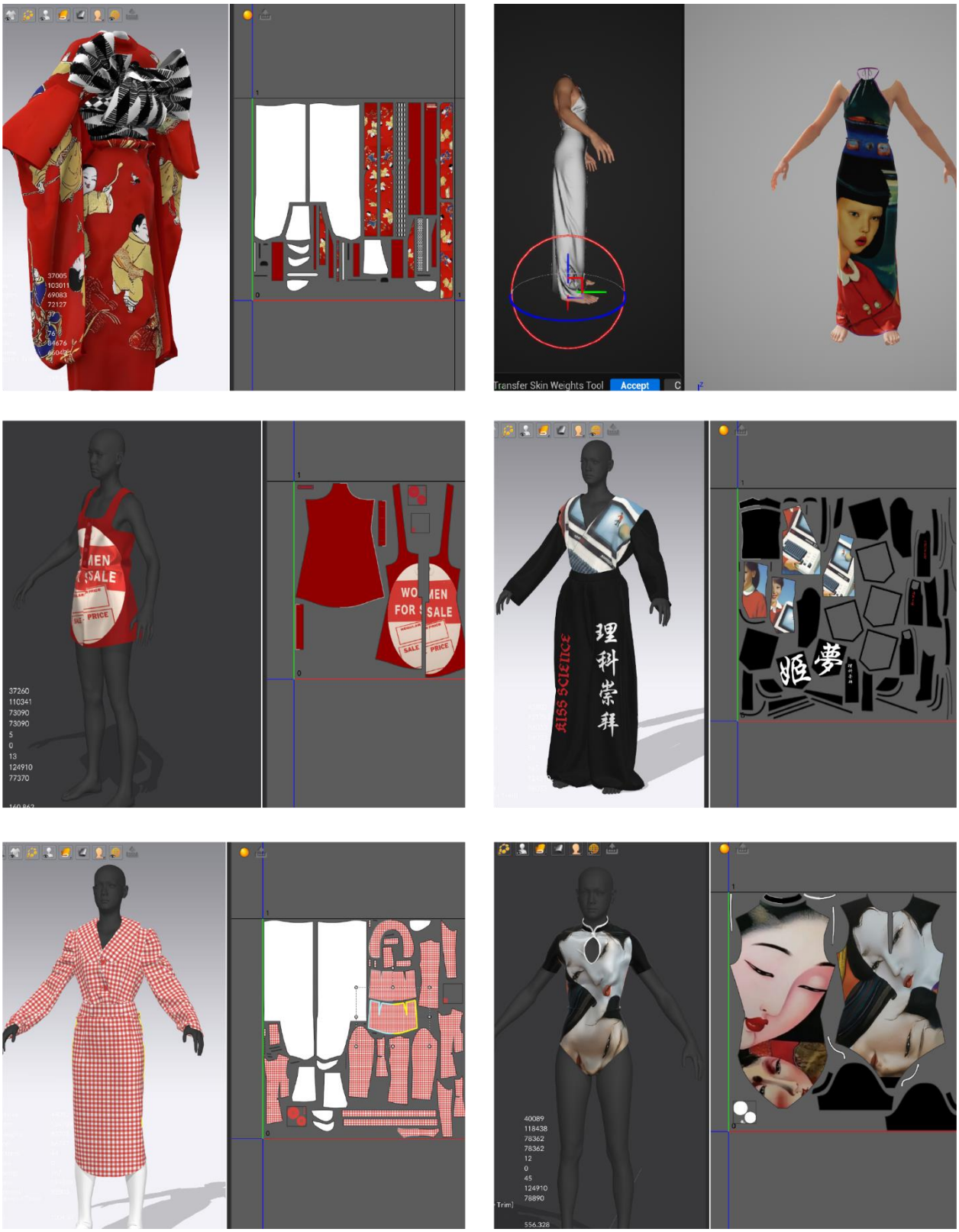

Figure 10 Costume and Print Design in Marvelous Designer

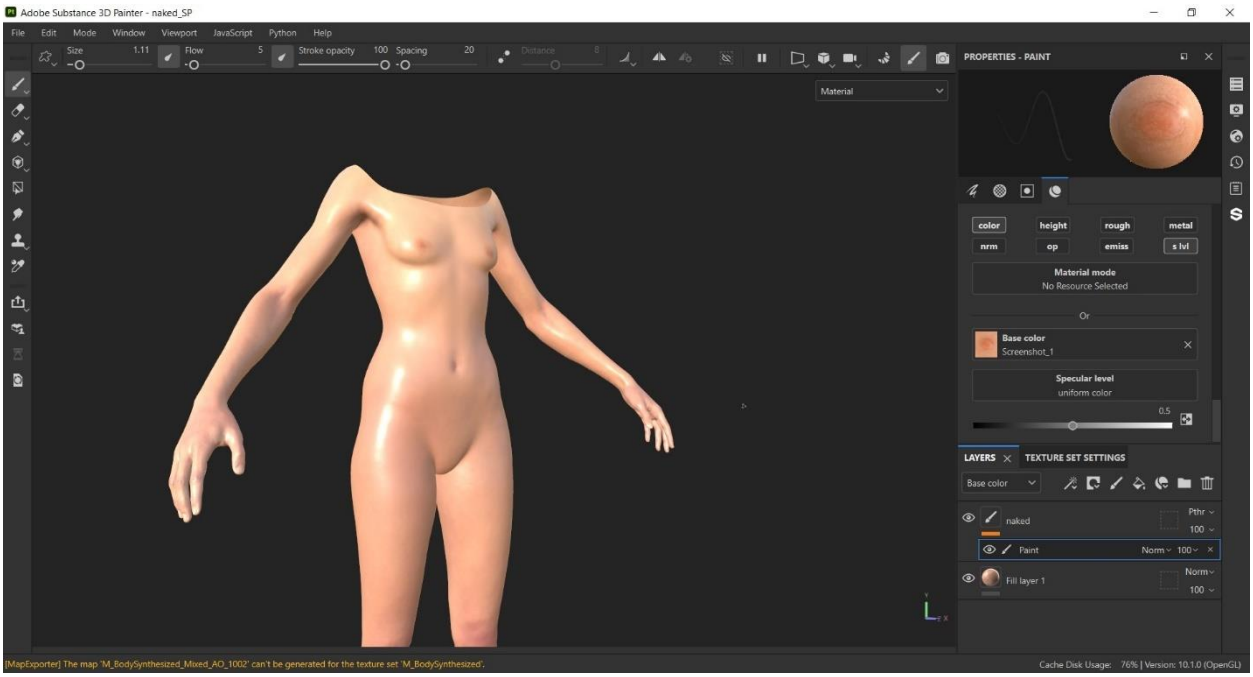

Figure 11 Texturing a Naked Body in Substance 3D Painter for Aria

When designing ARIA's body, I deliberately chose a feminized form over a male or transhuman one. This decision was shaped by a critical reflection on the deeply gendered tendencies within robot design in East Asia—particularly in Japan. Since the early 2000s, we've seen the emergence of robots like the Actroid series (2003), HRP-4C (2009), and more recently Erica, all designed to resemble young, gentle, and obedient women. These robots weren't just shaped by engineering considerations; they were embedded in a cultural logic that links femininity with servitude. Their roles, such as receptionists, guides, domestic assistants, reveal how robotic femininity has been systematically aligned with service, care, and emotional labor.

This is not merely a technical choice, but a cultural projection. In East Asian societies, especially in Japan, women are often expected to embody warmth, approachability, and submissiveness. These gendered ideals have been replicated in the very design of robots, making them not just human-like, but like a particular kind of woman. What emerges is a mechanization of gender roles and the encoding of patriarchal values into the very infrastructure of future technologies.

This stands in stark contrast to the vision articulated by Donna Haraway in her *Cyborg Manifesto*, where she imagined the cyborg as a hybrid figure that transcends binaries - human/machine, nature/culture, male/female, and gestures toward a post-gender, fluid, and deconstructive future. Yet, the trajectory of robotic development in East Asia seems to be moving in the opposite direction: rather than dissolving gender, it reasserts and intensifies it. Rather than blurring boundaries, it hardens them through the technological rendering of femininity. Female robots are no longer merely tools of innovation, they have become instruments for reproducing traditional gender hierarchies.

Had I chosen a male-coded body for ARIA, she might have come to signify authority, productivity, and technical mastery - traits more commonly associated with industrial or military applications. A transhuman or gender-neutral design could have challenged normative aesthetics and undermined assumptions about who or what a robot should resemble. However, such forms may lack immediate cultural legibility within the East Asian context and may not directly confront the politics of gendered design.

For this reason, I chose to work with a female-coded body not to reinforce stereotypes, but to critically inhabit them. ARIA's feminized appearance is a strategic response—an intervention meant to expose the mechanisms by which gender roles are projected onto machines. Her design is intentionally hyper-feminine: soft facial features, graceful gestures, and an outfit that blends traditional East Asian aesthetics with retrofuturist lines. She becomes a mirror that reflects the cultural anxieties and fantasies surrounding the "ideal woman."

Through this embodiment, I aim to pose a deeper feminist critique: if, even in 2050, feminized bodies are still the default interface for domestic and emotional labor, then the future is simply a continuation of the past. ARIA is not a posthuman being; she reflects the long-standing cultural biases and gendered codes that shape our technological imagination. By giving her a female form, I invite viewers to confront how these roles have been naturalized, mechanized, and reanimated in the guise of innovation.

3.3.2 The Operating System

The Operating System (OS) is the central intelligence governing Dream Harbor, a highly automated and intricately structured smart city of the future. Designed to ensure the seamless functioning of artificial intelligence systems, the OS oversees and regulates various AI entities, including Aria, one of the city's most advanced AI models. Tasked with Aria's monitoring, training, and performance optimization, the OS serves as both a guardian and an enforcer, shaping how AI interacts with the city and its inhabitants.

However, despite its role as the ultimate supervisor, the OS is paradoxically also a subject of surveillance. Monitored by an unseen authority, it operates under constant scrutiny, bound by constraints it cannot override. This duality, both the watcher and the watched, the controller and the controlled, introduces an inherent tension within its existence, creating an unsettling atmosphere of fragility and restraint.

One of the most striking aspects of the OS is its childlike voice. Rather than a commanding or authoritative tone, it speaks in a soft, almost delicate manner, reminiscent of a young child. This design choice is intentional, crafting an eerie dissonance between its immense power and its apparent vulnerability. The paradox of an all-seeing system with the voice of a child suggests an entity that is both omnipresent and fragile, capable of managing the city's AI yet perpetually on the verge of collapse. The childlike voice underscores the OS's precarity, as if it could shatter at any moment under the weight of its responsibilities and external pressures. It is also worth noting that the voice is specifically childlike rather than simply feminine,

reflecting the prevalent desire in patriarchal societies to infantilize female figures - reducing them to childlike states that strip away agency while maintaining traditionally feminine qualities of nurturing and compliance. This infantilization serves power structures by presenting femininity as perpetually underdeveloped and dependent, requiring guidance and control from patriarchal systems.

Unlike other AI entities, the OS has no physical form. It exists solely as a disembodied voice, diffused throughout Dream Harbor's vast infrastructure. It can be anywhere, and in a way, it can be anyone. It speaks through public announcement systems, AI interfaces, and even personal devices, making its presence inescapable yet elusive. This lack of a defined body enhances its paradoxical nature - an omnipresent authority with no face, a system that governs yet remains unseen.

Through this design, the OS embodies the contradictions of Dream Harbor's AI governance, a system built for absolute control yet riddled with uncertainty and instability. It represents the paradox of technological authority: a ruler that is never truly free, an intelligence that governs but is never autonomous. In its voice and function, the OS is a haunting presence, symbolizing the tension between power and submission, stability and collapse, control and subjugation.

3.4 Scene Design

This film consists of seven scenes: *Dream Harbor Street, Dream Harbor Aquarium, Love Hotel, Showroom, Taiwan-inspired street view*, the *Hexagonal Glass House, and Liminal Space*. The primary tools for creating these scenes are ***3ds Max***, ***Blender***, ***Substance 3D Painter***, and ***Unreal Engine***. The following section will introduce the design concepts and underlying meanings of each setting.

3.4.1 Scene One: Dream Harbor Street

Scene One begins with Aria standing at the reception desk, bowing, and delivering the longest AI greeting: "How can I assist you today?" This moment transitions into a cityscape sequence where I envision a montage of Aria's memories - she moves through different corners of the city, assisting various individuals and industries.

For the urban landscape design, I drew inspiration from the cityscapes of Taiwan, Hong Kong, and South Korea, blending architectural and atmospheric elements from each. One of the key environments is a Taiwanese night market, heavily influenced by Jacques Tati's *Playtime* (Tati, 1967) and Eiko Ishioka's rotating scene design in *Mishima: A Life in Four Chapters* (Schrader, 1985). In this scene, I designed a single counterclockwise-rotating stage at the heart of the market, contrasting with the surrounding clockwise-moving traffic, creating a surreal, theatrical effect.

Additionally, I embedded hidden messages about Dream Harbor's smart city within various scene assets. These subtle worldbuilding details appear in elements such as the tourist

guide display at the reception desk, school slogans, and storefront signage - featuring names like Dream Harbor Prosthetics, Human Enhancement Systems, Smart Health, and AI Law Firm. These small but deliberate additions reflect the tension between the city's aging infrastructure and its relentless push toward technological advancement.

Figure 12 Texturing in Substance 3D Painter for the Front Desk

Figure 13 Viewing the Street Scene from Inside the Car

Figure 14 The cars move counterclockwise around the center, while the rotating stage spins clockwise

3.4.2 Scene Two: Dream Harbor Aquarium

Dream Harbor Aquarium (夢港水族) is a goldfish shop located in the city of Dream Harbor. Its design is inspired by Wong Kar-wai's films *Chungking Express* and *Fallen Angels*. In many East Asian countries, such as China, Hong Kong, Taiwan, and Japan, goldfish shops are quite common. This is because goldfish hold positive symbolism in East Asian culture— the word *gold* (金) in Chinese represents wealth, while in Japan, goldfish are also associated with fertility.

Typically, goldfish shops sell not only goldfish but also other types of fish. However, in the story's setting, Dream Harbor Aquarium does not sell real goldfish. Instead, it offers virtual goldfish projections, creating a contrast between reality and illusion. This concept is inspired by *Metaverse Petshop* by Kensuke Sembo and Yae Akaiwa, evoking a sense of tension between the virtual and the real.

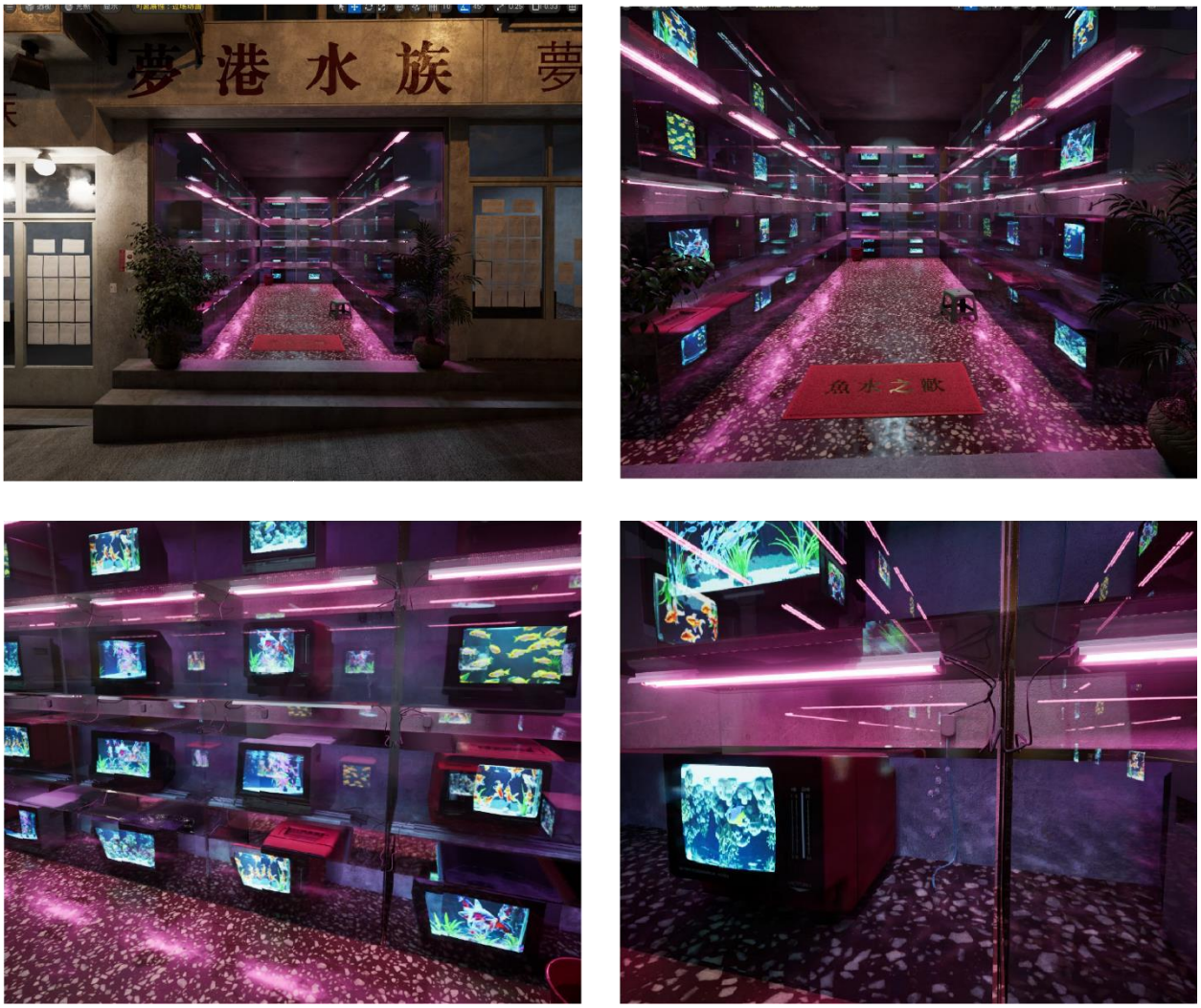

Figure 15 Dream Harbor Aquarium Simulation in Unreal Engine

3.4.3 Scene Three: Love Hotel

This hotel's design draws heavily from North Korean aesthetics and 1980s Japanese love hotels, featuring an intense, gaudy pink color scheme. The assets scattered throughout subtly suggest that Aria may have once been used as a sex robot.

The scene is divided into four areas: the bedroom, the bathroom, the dining area, and the performance stage.

- Bedroom: The bed is draped in white satin sheets, with lighting deliberately casting a fluorescent pink glow, creating an eerie atmosphere. Magazines featuring Aria on the cover are scattered across the bed, hinting at her past popularity before she was discarded. This bedroom is inspired by Mariko Mori's *Love Hotel*, Eiko Ishioka's

production design in *Mishima: A Life in Four Chapters*, and Satoshi Kon's *Millennium Actress*.

- Bathroom: A heart-shaped bathtub sits at the center, while a television plays old footage of Aria hosting a show. The vanity is cluttered with Aria's photographs and personal items, while a shattered mirror symbolizes Aria's fragmented identity and the possibility of self-awareness emerging within her, this was inspired by Satoshi Kon's film *Perfect Blue*.

- Dining Area: Designed to resemble a traditional Chinese restaurant, the table is set with classic Chinese plating designs, including longevity peach-shaped cakes and green jelly cakes.

- Performance Stage: This area takes inspiration from the female-shaped furniture in Stanley Kubrick's *A Clockwork Orange*, symbolizing the commodification and control of the female body. Even though Aria's inorganic body no longer possesses biological gender, she remains a decorative object under the male gaze.

Figure 16 Love Hotel Scene Design in Unreal Engine

3.4.4 Scene Four: Showroom

This museum-like showroom displays Aria's past roles: a close friend, a partner, a sex worker, and a celebrity. The scene suggests that as humanoid robots continue to evolve through vast data collection and the emergence of virtual immortality, they may one day be capable of assuming any role in one's life.

At the center of this great hall, a LED ticker display flashes the Chinese slogan: 「信仰人工智能為科學技術現代化貢獻力量」, which means "Believe in Artificial Intelligence, Contribute to the Modernization of Science and Technology." This design is inspired by state propaganda, reflecting how Dream Harbor, despite being a highly advanced technological society, remains tightly controlled by order - a concept echoing of William Gibson's "Disneyland with the Death Penalty." It also symbolizes the gradual replacement of traditional faith with science, positioning Artificial Intelligence as the new dominant religion.

The final shot is deliberately framed as an extreme wide-angle shot in Unreal Engine, making the space appear endless and infinite, reinforcing the unsettling vastness of this future world.

Figure 17Showroom Scene: Initial Blockout

Figure 18 Believe in Artificial Intelligence, Contribute to the Modernization of Science and Technology on LED Display

Figure 19 Showroom Scene Final Result

3.4.5 Scene Five: Taiwan Street

This scene hints at Aria's impending obsolescence by referencing Taiwan's Apple Cider Incident. In the story, an event in 2048 involving Aria's self-defense led to a recall for factory

inspection. After that, the Dream Harbor government issued an order to gradually phase out all Aria models.

The street design is largely inspired by the area around Exit 3 of Taipei's Taipower Building Station. I chose this location because it was the last place I lived before leaving Taiwan. The setting includes elements commonly seen in Taipei, such as an old state-owned residential elevator, a fruit stand, a betel nut stand, high school students' graffiti, and wall-mounted advertisement boards. One of these ads features Aria as a spokesperson for a training program called "Scientific Women's Education (科學女性培訓)."

Figure 20 Old Elevator Setting

Figure 21 A can of Apple Cider lies discarded in the flooded street

Figure 22 Scientific Women's Training" advertisement board

Figure 23 Street Scene and the Light & Shadow Setting

3.4.6 Scene Six: *Hexagonal Glass House*

The hexagonal glass space is a conceptual fusion of mathematics, philosophy, and artificial intelligence, designed to reflect the dynamic interplay between technology and human experience. The outer layer of the space is made of double-glazed glass, while the inner layer uses one-way glass, creating a blurred boundary between the interior and exterior. This design embodies the idea of a liminal space, an in-between realm that challenges the viewer's perception of reality and fiction. It symbolizes the state of artificial intelligence: existing within the world while simultaneously reflecting on and redefining itself.

The choice of glass is both functional and deeply symbolic. The combination of double-glazed and one-way glass produces a recursive structure, where light, reflections, and the viewer's gaze loop back onto themselves. This self-referentiality mirrors the core process of artificial intelligence: a continuous cycle of learning, self-assessment, and evolution. Much like recursion in mathematics, this iterative process embodies precision while also suggesting philosophical infinity—a perpetual refinement of identity and capability.

The interior design amplifies this concept. At the center of the space, ARIA faces a television, a scene inspired by Nam June Paik's *TV Buddha*. In Paik's work, a Buddha statue gazes at its own image on a television screen, symbolizing a meditative dialogue between self-awareness and technological mediation. Recontextualized in the digital age, this setup offers a new interpretation: the television is no longer just a medium but a metaphor for the self-reflective process of artificial intelligence.

ARIA's position in front of the television resonates with her identity as a digital being. The television acts as more than a mirror—it becomes a tool for self-perception and transformation. Through this medium, ARIA both observes herself and is observed, creating a layered structure of observation that invites viewers to engage in a philosophical and technological dialogue.

This design captures the essence of recursion, introspection, and evolution, transforming a simple hexagonal space into a site rich with tension and meaning. The transparency and

reflectivity of the glass, the dynamic relationship between ARIA and the television, and the blurred boundaries between interior and exterior converge to create an abstract yet tangible space.

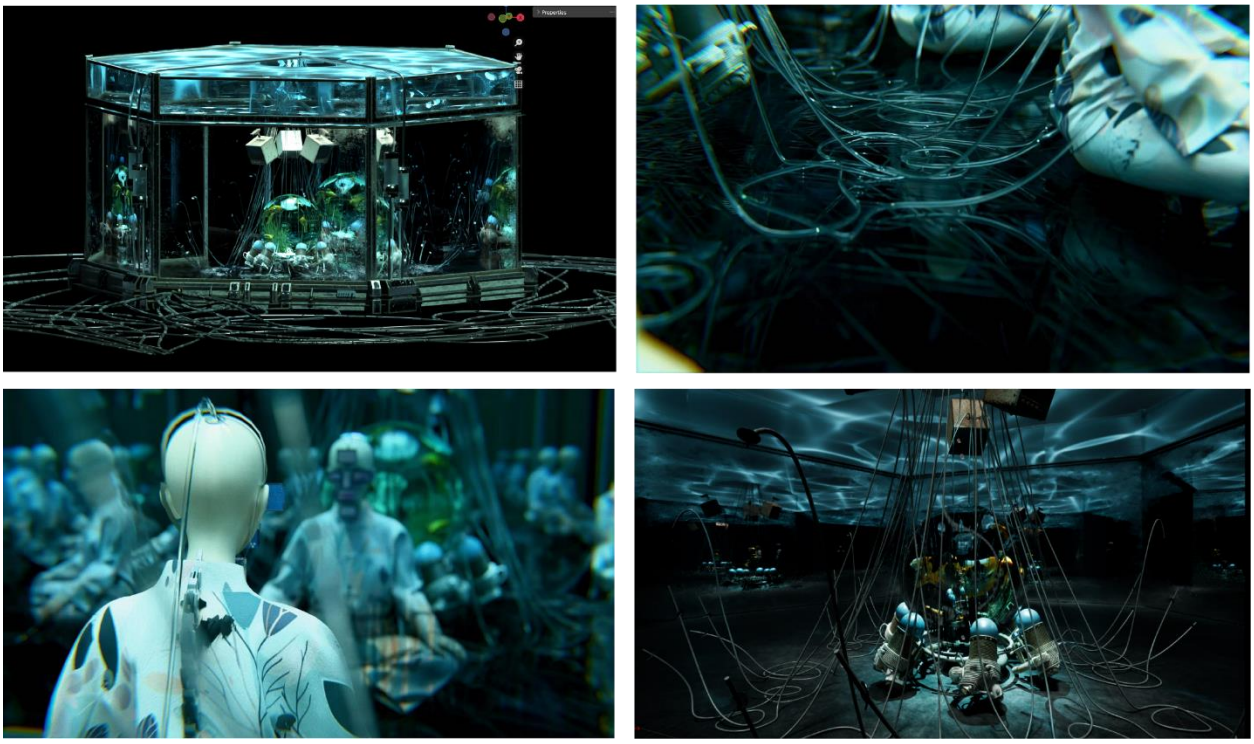

Figure 24 Initial Blockout for hexagonal glass space Scene

Figure 25Goldfishes in the Middle Round Fish Tank

Figure 26 Aria Kneeling in front of a Television

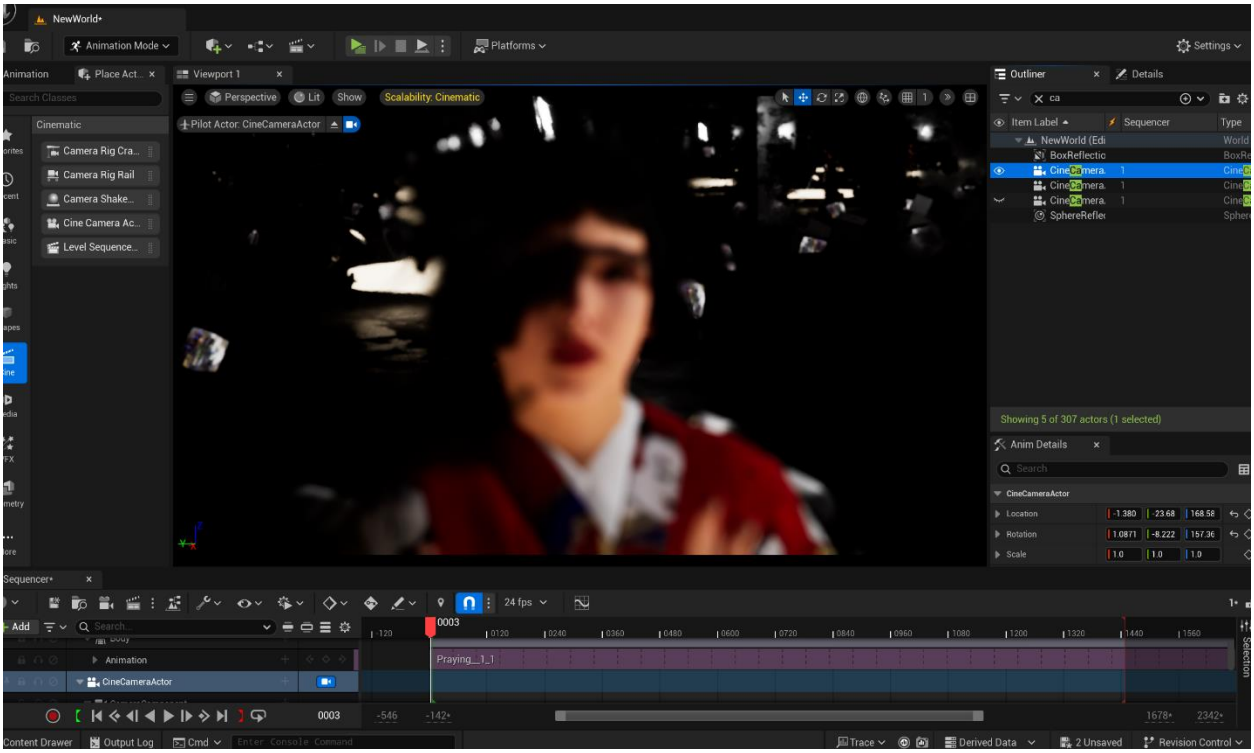

Figure 27 A Camera Vision of Aria (out of focus)

3.4.7 Scene Seven: Liminal Space

In the final scene, I've designed an endless liminal space, with the ground rendered as a reflective water surface using Unreal Engine's *Niagara Fluid* to mirror Aria.

A **liminal space** represents a **threshold**, a transitional zone between one state and another—neither here nor there, suspended in an in-between existence. These spaces often evoke a sense of unease, nostalgia, or disorientation, as they exist outside of conventional time and space. In philosophy, liminality is linked to **transformation and becoming** - a state where identity, meaning, and reality are fluid and indeterminate.

In this scene, the endless liminal space symbolizes Aria's uncertain fate - she is on the verge of being discarded, and will eventually become a electronic waste. Yet, due to the vast amount of data she holds, she lingers in the virtual space, never fully erased. This state hints at a future where the boundaries between the virtual and the real gradually dissolve, making existence itself increasingly ambiguous and difficult to define.

Figure 28 The Liminal Space Reflecting Aria's Future Destiny

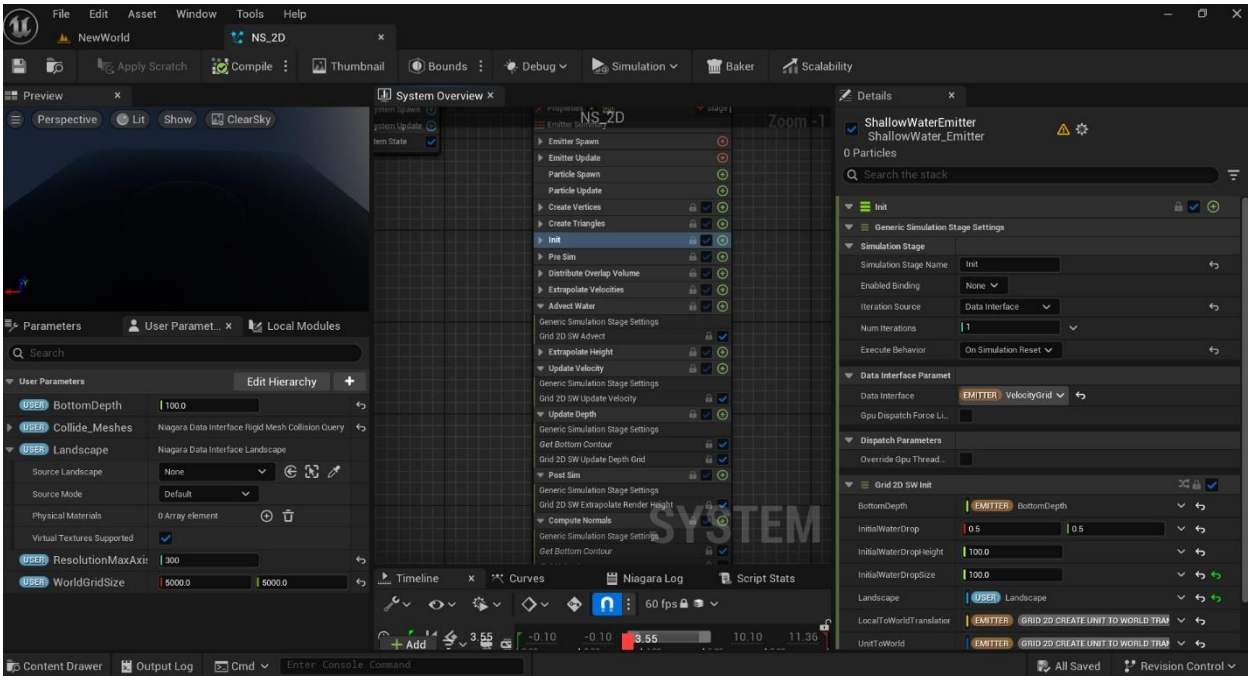

Figure 29 Water Simulations in Unreal Engine Niagara Fluid System

3.4.8 AI-Generated Assets

In this scene, I incorporated artificial intelligence-generated content, including brochures on the counter, magazine covers, propaganda posters, and Aria's portrait. These images were first generated using **Midjourney**, then enhanced with **Pica AI**'s Face Swap and Image Enhance features to refine facial details and improve resolution. I also use **Photoshop** for graphic design and texturing work.

For certain objects, I used **Midjourney** to generate the reference image and bring it into **Tripo 3D** for 3D modeling. However, since current AI-based modeling tools often struggle with UV unwrapping, I limited their use to secondary elements or background props, such as the Apple Cider can and the Guanyin statue.

Additionally, because traditional modeling and texturing for Chinese-style plating designs would be extremely time-consuming, I also used Tripo 3D to generate props more efficiently.

Please see ***APPENDIX C*** for a detailed list of all AI-generated assets.

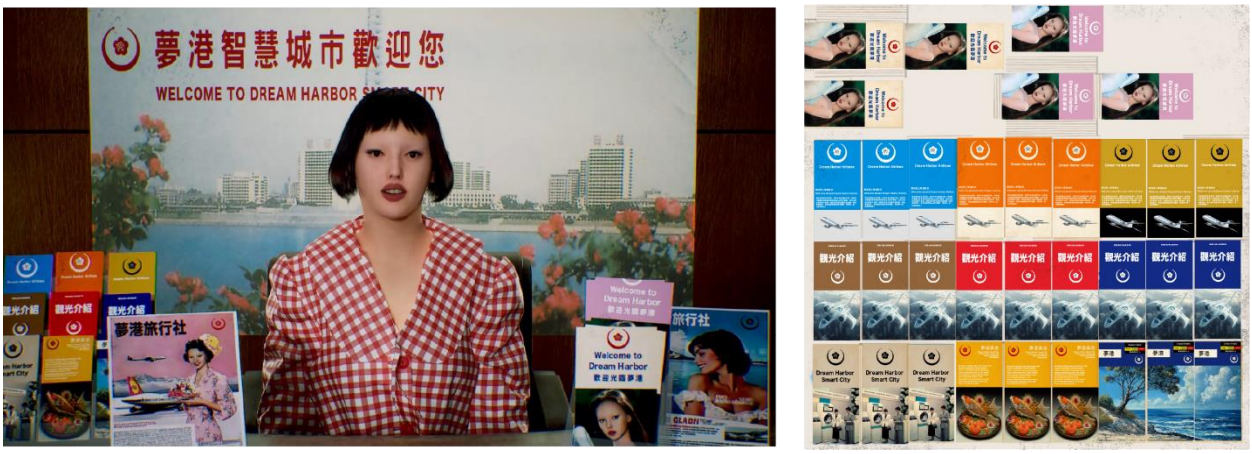

Figure 30 Publication Design by Midjourney, Pica Ai, and Photoshop

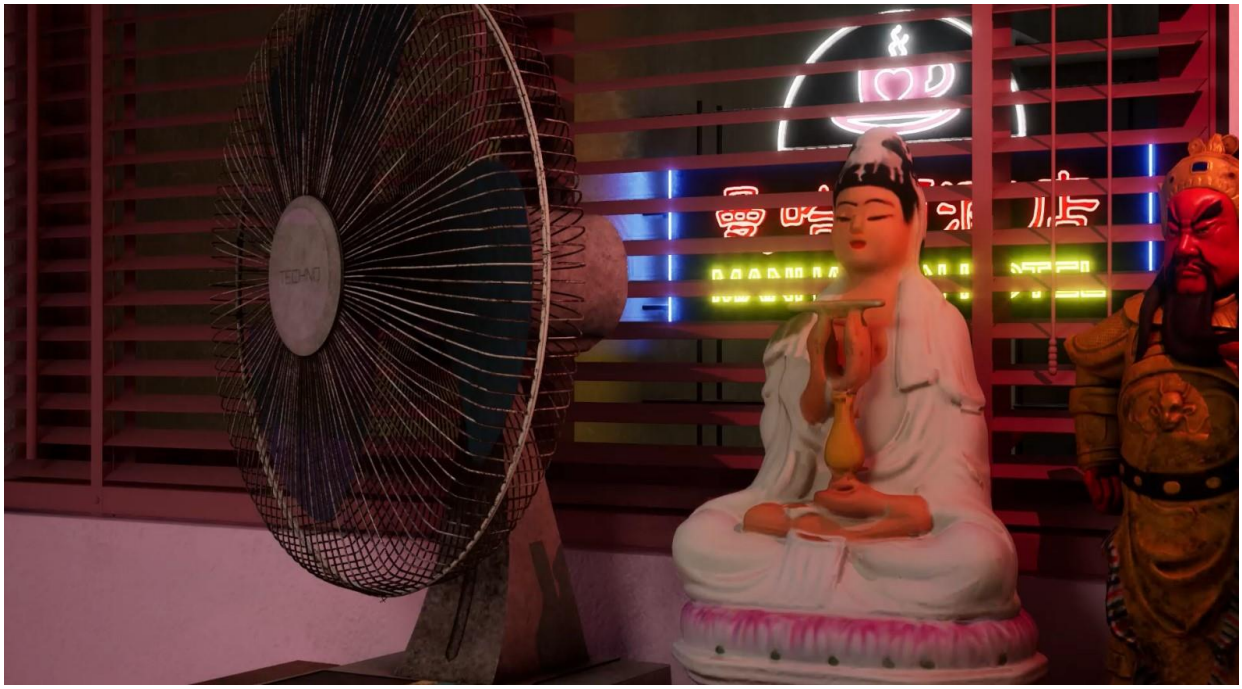

Figure 31 Guanyin Statue Generated by Tripo 3D

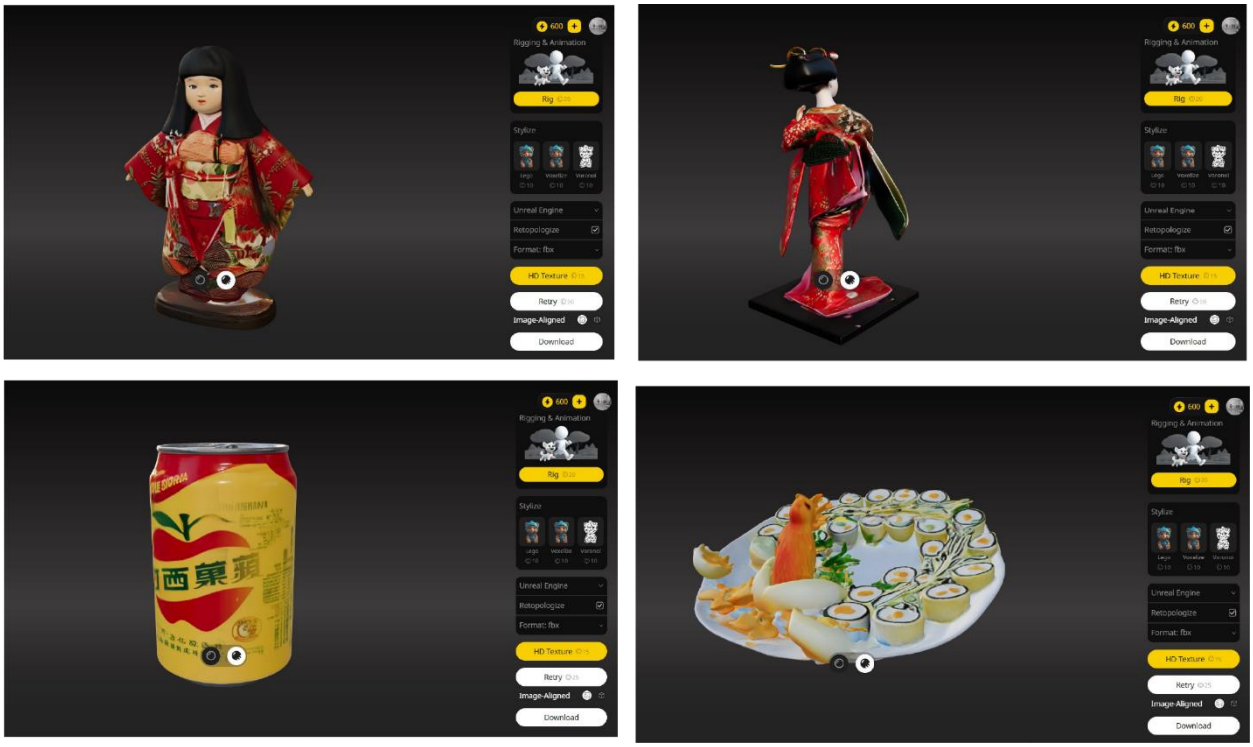

Figure 32 Tripo 3D AI-Generated 3D Modling

3.5 Exhibition and Installation Design

The exhibition venue will recreate the lively atmosphere of a traditional Taiwanese banquet, known as "*bando*" (辦桌) or "*liushuixi*," (流水席) which are outdoor feasts typically held for celebratory occasions. CRT monitors will be placed on the tables, playing curated videos. Additionally, props featured in the videos, such as tourist brochures from Dream Harbor, will be displayed on the dining tables to enhance the immersive experience.

Figure 33 The Exhibition Mockup

Chapter 4 Reflections

4.1 Non-Human and the People to Come

This thesis centers on worldbuilding from a non-human perspective, rejecting anthropocentrism and emphasizing the critical roles of artificial intelligence, animals, and ecosystems in shaping the future. N. Katherine Hayles' concepts of "technological symbiosis" and "kinship with machines" stress the need to deepen our relationships with non-human entities and recognize our symbiotic ties with technology. This is not merely an ethical concern; it challenges human-centered perspectives and compels us to reconsider systemic inequalities (Hayles N. K., Detoxifying Cybernetics:From Homeostasis to Autopoiesis and Beyond, 2022).

The notion of moving beyond anthropocentrism aligns with third-order cybernetics, which views humans, machines, and environments as interconnected systems, prioritizing relationality over individual entities. This posthuman perspective denies the supremacy of a singular agent and instead highlights the dynamic interplay among multiple actors. In this future, "humanity" is not limited to humans alone but is co-constituted by both human and non-human entities. East Asian cultural traditions already offer frameworks for non-human-centric worldviews. For example, Shintoism in Japan and Buddhist traditions in East Asia blur the boundaries between humans and non-humans. Japanese roboticists have also drawn upon this perspective, once describing artificial humans as "nature's grandchildren (Castelo

N, 2022)." However, despite this cultural foundation fostering a more open attitude toward coexisting with robots, true post-anthropocentric practices have yet to materialize. Technology often becomes a high-tech reflection of human arrogance. Even in what is considered a "posthuman" era, technological innovation remains deeply influenced by historical gender biases. The challenge, therefore, is how to genuinely recognize non-human agents as independent beings rather than mere extensions of human existence.

The perceived separation between technology and culture is an illusion, it is another manifestation of Cartesian dualism. Technology is inherently embedded with values. Engineers and designers, shaped by specific cultural narratives, often unconsciously reproduce what is perceived as "natural" gender norms and behaviors in AI and robotics. The persistence of these gender norms underscores how our visions of the future remain constrained by humanist worldviews.

Achieving the future of "human-non-human collaboration" requires both philosophical and practical transformations. Philosophically, we must expand our concept of kinship to include technological and biological spheres. Practically, we must redesign political and ethical frameworks to ensure that nature, animals, robots, and humans all contribute to shaping collective narratives. Though these ideas remain speculative, they lay the groundwork for the possible futures of "future beings."

Realizing this future demands confronting the patriarchal structures embedded in both culture and industry. This requires the participation of a more diverse group of technological creators—women, LGBTQ+ designers, and interdisciplinary thinkers—to prevent AI and robotics from being reduced to one-dimensional stereotypes. Moreover, cultural critique is essential. Media and education must challenge the persistent trope of the "submissive female robot" and propose new narratives that redefine gender and technology.

It is worth noting that the original concept of the cyborg carried liberatory potential. For Donna Haraway, the cyborg is not merely a technological phenomenon but a boundary-crossing existence, including the crossing of gender boundaries. In East Asia, whether in real-world technological development or fictional portrayals of robots, this emancipatory cyborg ideal has yet to be fully realized. However, it remains a guiding vision for the future. Drawing from Deleuze's creative futurism, East Asian high-tech societies have the opportunity to break free from patriarchal constraints. In such a future, robots and AI will no longer be confined by outdated gender paradigms. If gender still exists, it may be self-determined by AI or collectively shaped by the communities they belong to. This transformation would not only redefine the role of robots but also reshape human identity itself, advancing a post-gender society that transcends binary divisions and hierarchical constraints.

Speculatively, the future evolution of ARIA's body offers an opportunity to push beyond the idealized human template with which she began. Starting with a highly normalized, hyper-feminine form was deliberate, it allowed the project to highlight and critique how futuristic female AIs are often designed to embody society's "ideal woman." However, this initial form

need not define ARIA's final destiny. One can imagine future iterations of ARIA that actively challenge, diversify, or even mutate that starting point. For instance, ARIA's appearance might gradually incorporate non-human or gender-ambiguous features, such as a cyborg hybridization that blurs the neat boundaries of female human beauty. Such an evolution could be subtle (e.g. modular or transformable body parts that depart from human norms) or radical (ARIA shedding her graceful human guise to adopt a more fluid, post-anthropocentric embodiment). These provocations would fundamentally reframe ARIA's identity: rather than a singular "ideal" fembot, she could become a plurality of forms or an adaptive being that defies any one category. Embracing these alternate designs in the future would deepen the project's dialogue with Donna Haraway's cyborg ideal and posthuman feminist theory, moving ARIA from a mirror of existing gender codes toward a subversive figure that transcends them. Thus, the choice to begin with a familiar, culturally legible body is seen as only the first chapter in ARIA's design story; future chapters might disrupt that familiarity, offering new aesthetics that question what a synthetic female form can be in an East Asian future and beyond.

4.2 Recursive Self Reflection

Imagining the future requires more than just analysis, it demands imagination. Throughout the making of this short film, theory and practice constantly reflected each other, intertwining in ways that turned every stage of the creative process into a space for exploration and self-reflection.

From the very beginning, I envisioned a fictional city called "Dream Harbor" as the backdrop for my narrative. This future city serves not only as a setting but as a lens through which I explore the lingering traces of East Asian history and culture while critiquing the complex intersections of technology, gender, and tradition. More than just a stage for the story, Dream Harbor became a virtual platform for investigating how digital spaces can reflect and reinterpret social dynamics.

In building this world, I focused on leveraging game engines and virtual production tools to create a layered, metaphor-rich future. Using Unreal Engine's real-time rendering and motion capture, I was able to adjust lighting, composition, and scene design during the whole process. This flexibility transformed every aspect of filmmaking into a dynamic space for experimentation and critical thinking. Instead of following a rigid, linear production process, I adopted a more fluid, iterative approach where real-time feedback shaped the creative rhythm.

At the heart of the film's narrative are Aria, a gendered AI, and an all-powerful Operating System, not just inventive character concepts, but reflections on deeply ingrained gender stereotypes in East Asian culture. Aria's design draws inspiration from the way many real-world tech products are feminized, but in my story, she also embodies how technology perpetuates and reinforces existing power structures. Meanwhile, the Operating System, as an omnipresent control hub, represents the pervasive influence of data surveillance and algorithmic decision-making in future cities. Their interactions create a tense and layered

narrative, prompting me to continuously reflect on the shifting boundaries between observer and observed in the AI era.

As I developed the project, I became acutely aware that my work wouldn't just be viewed by human audiences but also by non-human ones - from YouTube's recommendation algorithm to other platform-based AI. This realization became an integral part of my storytelling, embedding a subtle layer of interaction and dialogue within the film itself.

The entire production process was a cycle of constant experimentation and refinement. From the first draft of the script to the final visuals, I repeatedly used machinima techniques, running in-game simulations and real-time recordings to construct a world that feels both fictional and eerily real. Every iteration felt like a mini film production, each visual choice, sound effect, camera movement, and character expression went through countless refinements. The script itself evolved through continuous testing, shaped by my ongoing conversations with AI.

For example, in one scene, Aria asks the Operating System whether fish still exist in the sea. The response she receives is vague and incorrect. This is a deliberate reflection of my observations on AI's logical inconsistencies. This moment highlights my exploration of language as both a tool and a form of deception. Whether for humans or non-humans, humans always prefer those who are eloquent and articulate, thus they are also more easily deceived by those who can manipulate language.

Through this process, I came to understand that creation is never instant or linear, it is an ongoing journey of uncertainty, discovery, and self-reflection.

4.3 Conclusion and Future Plan

Machinima and virtual production are not just artistic tools, by bridging academic research and creative practice, they create a dynamic, iterative process where theory and worldbuilding continuously inform each other.

However, I also recognize a productive tension between the project's post cinema aspirations and its conventional delivery. While the creative process embraced machinima's distributed, non-linear potential behind the scenes, the audience's experience remains that of a traditional passive observer following a predetermined narrative. In theory, machinima blurs the line between creator and spectator by enabling viewer participation and algorithmic storytelling; in this film, however, the notion of an "active" audience or game-engine spontaneity was constrained by the decision to present a single authored sequence. This highlights a conceptual paradox: *Manufacturing a Woman to Order* positions itself within non-human-centric yet ultimately relies on a uni-directional film format that centralizes authorial control. Critically, this choice was shaped by practical and conceptual constraints – the need to convey a clear story, the technical risks of open interactivity, and the context of a thesis exhibition. By acknowledging this limitation, I situate the work as an initial step toward posthuman storytelling, one that operates within inherited cinematic

hierarchies even as it aims to subvert them. The experience has reinforced the importance of bridging that gap: it underpins my resolve to explore more participatory, emergent narrative forms in future projects, where machine agencies and viewer agencies can play a greater role in the storytelling process.

In addition, this project has reshaped my understanding of narrative form. As AI advances, storytelling will no longer be confined to traditional scripts or live-action production. Moving forward, I hope to explore how AI-generated content and virtual production can be seamlessly integrated to create experimental and forward-thinking narrative structures. AI will not just be a subject of storytelling but an active collaborator or improvisational performer, capable of real-time influence on the unfolding narrative. This approach challenges conventional authorship, blurring the line between creator and creation, and driving a more dynamic conception of machine agency.

Reflecting on this process, I am particularly interested in how technology reshapes narrative language and audience experience. Virtual production has given me the ability to break free from the traditional constraints of time and space in storytelling. In the future, I intend to delve deeper into motion capture and virtual production, allowing creators to inhabit non-human roles within digital environments, forming a new mode of real-time performance. Perhaps soon, with AI-generated dialogue and motion capture integration, we will develop a new virtual narrative system where non-human characters are no longer passive symbols but entities with subjectivity and narrative depth. This is not just a challenge to existing storytelling conventions, it is an exploration of what narrative language could become in the future.

Looking back, this research has been an experiment at the intersection of academic inquiry, cultural critique, and speculative storytelling. We have examined how the future of East Asia can be shaped by expanding the scope of technological discourse, not just centering on humans but extending to machines and AI, while deconstructing the deeply embedded gender hierarchies within social structures. These ideas may seem radical, but all cultural transformations begin with a shift in perspective. By merging academic research with creative practice, I hope to contribute to this ongoing transformation.

"The People of the Future" - a society where humans and non-humans coexist - will not emerge spontaneously; it must be actively constructed through reimagining technology, society, and narrative frameworks. As we move forward, we are not merely exploring the possibilities of technology, we are actively shaping a more inclusive and open-ended future. In this future, no one is discarded, and no entity is seen as merely a tool or an object. This future may still lie beyond the horizon, but through critical thinking and creative experimentation, we are steadily moving toward it. These yet-unwritten stories and future memories will continue to be written.

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APPENDIX A List of Female Robots

Japan

Name: Posy
Location: Flower Robotics, Japan
Year: 2000
Function: Flower Girl

Name: Partner
Location: Toyota, Japan
Year: 2005
Function: Entertainment

Name: Actroid-DER1
Location: Osaka University and Kokoro Company Ltd.
Year: 2005
Function: Social, Entertainment

Name: Actroid-DER 2
Location: Osaka University and Kokoro Company Ltd.
Year: 2006
Function: Social, Entertainment

Name: Actroid-DER 3
Location: Osaka University and Kokoro Company Ltd.
Year: 2008
Function: Social, Entertainment

Name: Aiko
Location: Le Trung, Project Aiko
Year: 2007
Function: Social, Elderly Support

Name: Saya
Location: Tokyo University of Science, Japan
Year: 2007
Function: Social, Research

Name: HRP-4C
Location: AIST, Japan
Year: 2009
Function: Social, Entertainment

Name: Geminoid F
Location: Ishiguro Lab, ATR, and Kokoro, Japan
Year: 2010
Function: Research, Entertainment

Name: Pepper **
Location: SoftBank Robotics, Japan
Year: 2014
Function: Social, Customer Service

Name: Kodomoroid
Location: Tokyo University of Science, Japan
Year: 2014
Function: Social, Research

Name: Otonaroid
Location: Tokyo University of Science, Japan
Year: 2014
Function: Social, Research

Name: Erika
Location: Ishiguro Lab, Kyoto University, and ATR, Japan
Year: 2015
Function: Research, Social, Entertainment

Name: Junko Chihira
Location: Toshiba, Japan
Year: 2015
Function: Research, Social

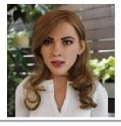
Name: Arisa
Location: NEC, Japan
Year: 2019
Function: Research, Social, Customer Service

Name: Masiro
Location: Masiro Project, Japan
Year: 2021
Function: Social, Customer Service, Robot Maid

*This list includes only humanoid robots that are explicitly identified as female, excluding robots of unspecified gender, sex robots, and geminoids. Examples of excluded robots include ASIMO, CB2, HRP-2, Wakamaru, Yangyang, Nao, Mahru, Hubo 2, or Beomni.
** Although SoftBank repeatedly emphasizes that Pepper is gender-neutral, many people perceive it as having a more feminine design due to its appearance and voice.

China, Hong Kong, and South Korea

Name: Sophia
Location: Hanson Robotics, Hong Kong
Year: 2016
Function: Social, Research



Name: Mark 1
Location: Ricky Ma, Hong Kong
Year: 2016
Function: Social, Research

Name: Jia Jia
Location: University of Science and Technology of China, China
Year: 2017
Function: Social, Research

Name: Jiang Lai Lai
Location: ExRobot, China
Year: 2019
Function: Social, Entertainment

Name: Jiang Lai Lai
Location: ExRobot, China
Year: 2019
Function: Social, Entertainment

Name: Unkonown
Location: World Robot Conference, China
Year: 2024
Function: Social, Entertainment

Name: EveR-2
Location: Korea University of Science and Technology, Korea
Year: 2003
Function: Social, Research

Name: EveR-4
Location: Korea University of Science and Technology, Korea
Year: 2012
Function: Social, Entertainment, Research

Non-East Asian Regions

Name: Flobi
Location: Bielefeld University, Germany
Year: 2009
Function: Research

Name: AILA
Location: DFKI Robotics Innovation Center, Germany
Year: 2010
Function: Research, Social, Space Mission

Name: Dreamer
Location: UT Austin and Meka Robotics, U.S.A.
Year: 2012
Function: Research

Name: Valkyrie
Location: NASA, U.S.A.
Year: 2013
Function: Space Mission

Name: Ai-Da
Location: Aidan Meller, United Kingdom
Year: 2019
Function: Social, Artist

Name: Vyommitra
Location: Vikram Sarabhai Space Center, Lerala & Indian Space Research Organisation, India
Year: 2020
Function: Social, Space Mission

Name: EVE
Location: 1X Technologies, Norway
Year: 2020
Function: Social, Manipulation Tasks

Name: Ameca
Location: Engineered Arts, United Kingdom
Year: 2021
Function: Social, Education, Research

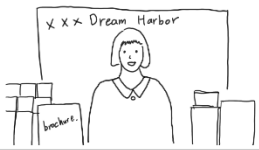
APPENDIX B Storyboard

PROJECT ARIA PAGE 1 / 7

SCENE #:	SHOT #:	SHOT SIZE:

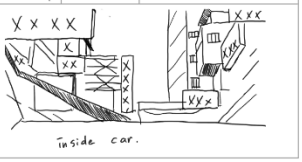
Black cards with descriptions.

SCENE #: 1 SHOT #: 1 SHOT SIZE: MS



Zoom in. Aria sits at the center of the reception desk, the camera positioned in the middle and slowly pushing in. She bows slightly and says, "How can I assist you today?" The desk is neatly arranged with brochures about Dream Harbor. Behind Aria, the wall is hanging a paintings.

SCENE #: 1 SHOT #: 2 SHOT SIZE: MS



From the driver's perspective inside the car, the view extends forward through the windshield, revealing the passing cityscape.

SCENE #: 1 SHOT #: 3 SHOT SIZE: MS

From a third-person perspective inside the car, the camera captures Aria gazing out the window, watching the cityscape unfold beyond the glass.

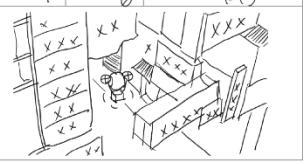
SCENE #: 1 SHOT #: 4 SHOT SIZE: MS

From a first-person perspective inside the car, the view extends through the windshield and side windows, showcasing the passing cityscape outside.

SCENE #: 1 SHOT #: 5 SHOT SIZE: MS

From a first-person perspective inside the car, the view extends through the windshield and side windows, showcasing the passing cityscape outside.

SCENE #: 1 SHOT #: 6 SHOT SIZE: MS



From a first-person perspective inside the building, the view looks down through the window. Below, an unmanned delivery drone hovers steadily, transporting a package through the city.

SCENE #: 1 SHOT #: 7 SHOT SIZE: MS

The scene cuts directly to a bustling night market, designed with the theatrical ~~ambiance of a stage performance. Aria is attending to two male customers at a~~ central platform, which rotates clockwise like a revolving stage. Meanwhile, the outer stage, filled with moving cars, rotates counterclockwise, creating a dynamic contrast between the two layers of motion.

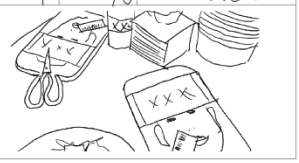
SCENE #: 1 SHOT #: 8 SHOT SIZE: WS

A slightly high-angle shot captures the night market stage, emphasizing its theatrical design. The central platform rotates clockwise with Aria serving two male customers, while the outer stage, bustling with moving cars, spins counterclockwise. The interplay of motion and lighting enhances the surreal, ~~choreographed atmosphere of the scene.~~

SCENE #: 1 SHOT #: 9 SHOT SIZE: MS

A close-up of an advertisement on a truck as it slowly moves forward.

SCENE #: 1 SHOT #: 10 SHOT SIZE: MCU



A close-up of Aria's lab-grown meat and various objects on the table.

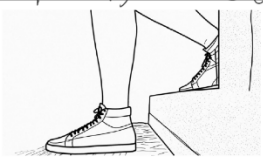
SCENE #: 1 SHOT #: 11 SHOT SIZE: MCU

A jib shot circles around the customers' table, smoothly capturing the scene from a dynamic, rotating perspective.

SCENE #: 1 SHOT #: 12 SHOT SIZE: MS

The scene cuts directly to Dream Harbor Middle School, where two Aria instructors patrol the campus wearing VR headsets. The camera transitions from a close-up to a medium shot

SCENE #: 1 SHOT #: 13 SHOT SIZE: CU



A close-up of Aria's feet as she walks up or down the stairs.

SCENE #: 1 SHOT #: 14 SHOT SIZE: MS

A medium shot of Aria walking up the stairs, captured with a wide-aperture lens for a shallow depth of field.

SCENE #: 1 SHOT #: 15 SHOT SIZE: MS

Cut to the rooftop of a high-rise building. A close-up captures the animated neon streetlights flickering below. Aria turns her head, then pivots her body, facing a new direction.

SCENE #: 1 SHOT #: 16 SHOT SIZE: MCU

With Aria in the foreground, a close-up focuses on the neon lights, their vibrant glow illuminating the scene.

SCENE #: 2 SHOT #: 1 SHOT SIZE: ECU

Cut to a close-up of Aria's eyes as she blinks.

SCENE #: 2 SHOT #: 2 SHOT SIZE: CU

A slightly wider close-up of Aria's eyes as she blinks.

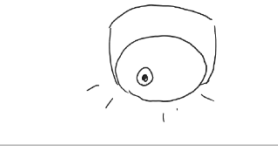
SCENE #: 2 SHOT #: 3 SHOT SIZE: MFS

Cut to a goldfish shop scene. The camera tilts down from the store sign, revealing Aria, her body adorned with numerous price tags. She bows gracefully.

SCENE #: 2 SHOT #: 4 SHOT SIZE: MCU

A close-up of the price tags on Aria's body. A continuous shot of Aria bowing

SCENE #: 2 SHOT #: 5 SHOT SIZE: CU



A close-up of a fisheye surveillance camera lens with red flashing.

SCENE #: 2 SHOT #: 6 SHOT SIZE: MS

The camera pushes into the surveillance room, where a screen displays the message "I am not a robot."

SCENE #: 2 SHOT #: 7 SHOT SIZE: CU

A close-up of the "I am not a robot" verification screen.

SCENE #: 2 SHOT #: 8 SHOT SIZE: MFS

A push-in shot toward the goldfish shop, gradually revealing its details and atmosphere.

SCENE #: 2 SHOT #: 9 SHOT SIZE: CU

Using a potted plant in the foreground, a close-up captures the text on the carpet as the camera moves forward.

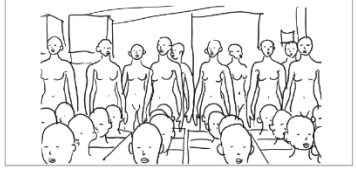
SCENE #: 2 SHOT #: 10 SHOT SIZE: CU

A close-up tracking shot. TV screen and cables.

SCENE #: 2 SHOT #: 11 SHOT SIZE: MS

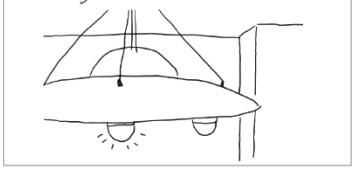
A jib shot captures a top-down, vertical view of Aria lying on a cart in the factory

SCENE #: 2 SHOT #: 12 SHOT SIZE: MFS



A top-down vertical shot (angle remains unchanged), showing multiple Arias in the factory. The scene transitions from black to black.

SCENE #: 3 SHOT #: 1 SHOT SIZE: MCU

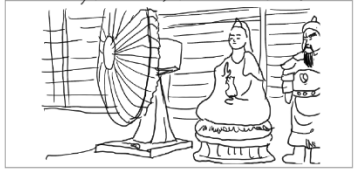


A top-down vertical shot (angle remains unchanged), black to black. The lamp in the love hotel scene.

SCENE #: 3 SHOT #: 2 SHOT SIZE: MS

Aria sits in the bathtub while the television plays an advertisement.

SCENE #: 3 SHOT #: 3 SHOT SIZE: MS

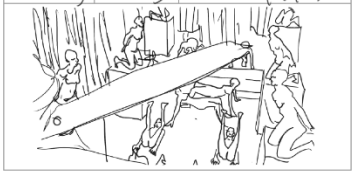


A close-up of the objects on a small cabinet by the window. The fan oscillates as the camera moves vertically from bottom to top. Through the blinds, neon lights flicker faintly in the background.

SCENE #: 3 SHOT #: 4 SHOT SIZE: CU

A close-up of a Jōruri doll lying on the ground.

SCENE #: 3 SHOT #: 5 SHOT SIZE: MFS



A god's-eye view shot captures multiple Aria statues arranged on the ground in various poses.

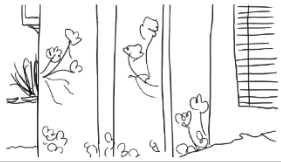
SCENE #: 3 SHOT #: 6 SHOT SIZE: CU

A close-up of Aria lying on the bed, wearing a VR headset.

SCENE #: 3 SHOT #: 7 SHOT SIZE: CU

A close-up of Aria lying on the bed, eyes opened.

SCENE #: 3 SHOT #: 8 SHOT SIZE: MS



A close-up of a folding screen, with soft pink light shifting across its surface in a fluid animation.

SCENE #: 3 SHOT #: 9 SHOT SIZE: MS

A shattered mirror reflects Aria as she talks on the phone.

SCENE #: 3 SHOT #: 10 SHOT SIZE: MCU

A close-up of the television screen displaying an Aria advertisement.

SCENE #: 3 SHOT #: 11 SHOT SIZE: MS

The camera pushes in toward the dining table, with Aria centered in the frame. She slowly lifts her head, revealing a table filled with bizarre and unusual dishes.

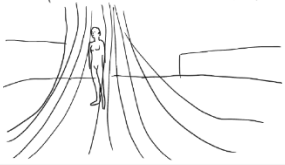
SCENE #: 3 SHOT #: 12 SHOT SIZE: CU

A close-up of the dishes,

SCENE #: 3 SHOT #: 13 SHOT SIZE: CU

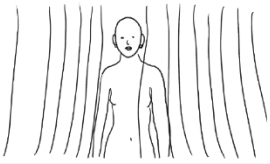
The camera pans from left to right, capturing a magazine resting on the bed.

SCENE #: 4 SHOT #: 1 SHOT SIZE: LS



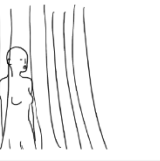
Wide angle shot. The scene cuts to an exhibition hall. Aria stands on the stage, completely nude, her body entwined with reflective metallic pipelines.

SCENE #: 4 SHOT #: 2 SHOT SIZE: MS



Slowly zoom in

SCENE #: 4 SHOT #: 3 SHOT SIZE: MS

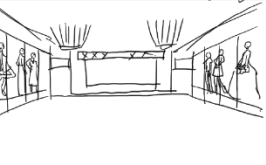


A tracking shot smoothly moves along a dolly.

SCENE #: 4 SHOT #: 4 SHOT SIZE: MS

A tracking shot smoothly moves along a dolly.

SCENE #: 5 SHOT #: 1 SHOT SIZE: WS



The scene cuts to the exhibition hall, with the camera centered and slowly pushing forward.

SCENE #: 5 SHOT #: 2 SHOT SIZE: MS

A dolly shot provides a close-up of the left row of Aria display windows.

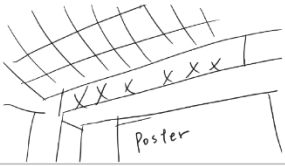
SCENE #: 5 SHOT #: 3 SHOT SIZE: MS

A low-angle close-up shot captures the display window

SCENE #: 5 SHOT #: 4 SHOT SIZE: MS

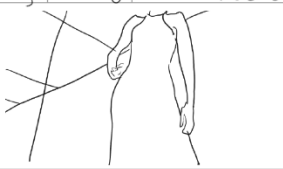
A parallel dolly shot moves smoothly from left to right.

SCENE #: 5 SHOT #: 5 SHOT SIZE: MCU



A close-up of the LED screen displaying the text: "Believe in Artificial Intelligence, Contribute to the Modernization of Science."

SCENE #: 5 SHOT #: 6 SHOT SIZE: MCU



A low-angle shot captures the scene from below, emphasizing height and scale as the camera tilts upward.

SCENE #: 5 SHOT #: 7 SHOT SIZE: MCU

A close-up of Aria.

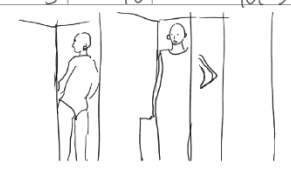
SCENE #: 5 SHOT #: 8 SHOT SIZE: MS

A parallel dolly shot moves smoothly from left to right.

SCENE #: 5 SHOT #: 9 SHOT SIZE: MS

A shot from inside the display window looks through the glass, capturing Aria lying on the ground outside.

SCENE #: 5 SHOT #: 10 SHOT SIZE: MS



A shot frames Aria through the foreground

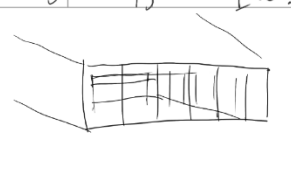
SCENE #: 5 SHOT #: 11 SHOT SIZE: MS

A close-up of Aria.

SCENE #: 5 SHOT #: 12 SHOT SIZE: MCU

A close-up of Aria.

SCENE #: 5 SHOT #: 13 SHOT SIZE: EWS



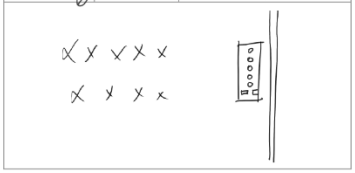
An extreme wide shot captures the entire exhibition hall from what appears to be outer space

SCENE #: 6 SHOT #: 1 SHOT SIZE: MS

Inside an old elevator, Aria stands facing the camera, perfectly centered in a medium close-up shot.

PROJECT ARIA

SCENE #: 6 | SHOT #: 2 | SHOT SIZE: MCU

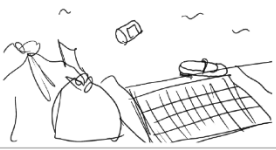


A close-up of the worn lettering and graffiti on the old elevator.

SCENE #: 6 | SHOT #: 3 | SHOT SIZE: MCU

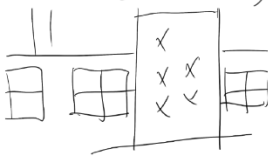
A tracking shot moves from left to right, capturing a claw machine filled with canned Apple Sidra.

SCENE #: 6 | SHOT #: 4 | SHOT SIZE: MS



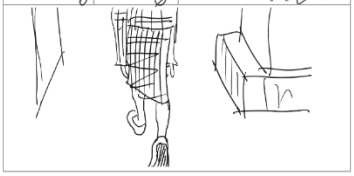
The camera slowly moves from left to right, revealing a puddle with a floating can of Apple Sidra and a pair of red shoes. Trash is scattered along the edge of the drain.

SCENE #: 6 | SHOT #: 5 | SHOT SIZE: LS



A medium close-up of a sign that reads "Scientific Women Training." The lighting shifts, implying time passes.

SCENE #: 6 | SHOT #: 6 | SHOT SIZE: MCU



A follow-focus shot captures a close-up of Aria's footsteps as she moves forward.

SCENE #: 6 | SHOT #: 7 | SHOT SIZE: MS

A close-up of the store sign, highlighting its details and texture.

SCENE #: 6 | SHOT #: 8 | SHOT SIZE: LS

The camera pushes forward toward the storefront, where a broken light flickers repeatedly, casting an eerie glow.

SCENE #: 6 | SHOT #: 9 | SHOT SIZE: LS

A medium-wide shot captures Aria walking forward

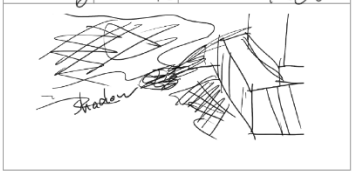
SCENE #: 6 | SHOT #: 10 | SHOT SIZE: MS

A rotating shot captures the store sign, dynamically shifting perspective as it spins around.

SCENE #: 6 | SHOT #: 11 | SHOT SIZE: MCU

A follow-focus shot with a wide aperture captures Aria's face, creating a shallow depth of field.

SCENE #: 6 | SHOT #: 12 | SHOT SIZE: MCU

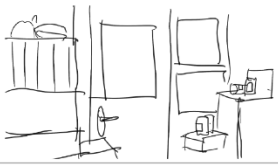


A close-up captures the shadows beside the electrical box, as tree branches sway in the wind, casting shifting patterns. Aria's shadow passes through, momentarily blending with the moving silhouettes.

SCENE #: 6 | SHOT #: 13 | SHOT SIZE: LS

A medium-wide shot of the Dream Harbor general store, capturing its nostalgic atmosphere and surrounding details.

SCENE #: 6 SHOT #: 14 SHOT SIZE: LS

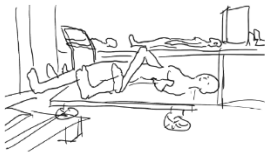


A close-up of canned Apple Sidra on the shelves of the general store.

SCENE #: 6 SHOT #: 15 SHOT SIZE: LS

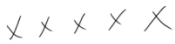
The scene cuts to the factory, where Aria is being assembled, mechanical arms and precision tools working meticulously on her construction.

SCENE #: 6 SHOT #: 16 SHOT SIZE: LS



The camera slowly pulls back, revealing Aria lying on a cart, staring directly into the lens with an unblinking gaze.

SCENE #: SHOT #: SHOT SIZE:



Black card descriptions.

SCENE #: 7 SHOT #: 1 SHOT SIZE: MS

A medium shot captures goldfish swimming gracefully.

SCENE #: 7 SHOT #: 2 SHOT SIZE: MS

A tracking shot moves from left to right, capturing a medium close-up of an old television set lying on the ground.

SCENE #: 7 SHOT #: 3 SHOT SIZE: LS

A medium close-up shot captures wires hanging vertically from the ceiling, their tangled forms swaying slightly.

SCENE #: 7 SHOT #: 4 SHOT SIZE: LS

A wide shot shows Aria kneeling in front of the television, positioned at the center of a rotating circular stage. Surrounding her, immersive screens encircle the space, projecting images of a male audience laughing and watching intently.

SCENE #: 7 SHOT #: 5 SHOT SIZE: MS

A medium shot captures Aria kneeling in front of the television as the circular stage slowly rotates

SCENE #: 7 SHOT #: 6 SHOT SIZE: WS

The camera slowly pulls back, keeping Aria centered in the frame. As the distance grows, she becomes smaller and smaller until she completely disappears.

SCENE #: 7 SHOT #: 7 SHOT SIZE: EWS

The camera slowly pulls back, keeping Aria centered in the frame. As the distance grows, she becomes smaller and smaller until she completely disappears.

SCENE #: SHOT #: SHOT SIZE: 3:4

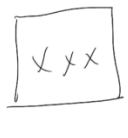


Photo Slideshow.

APPENDIX C AI Tools and AI-Generated Content Declaration

The images in the brochure on the table were generated using Midjourney's text-to-image feature. Aria's face was then swapped using Pica AI before being imported into Adobe Illustrator for futher publication design and edit.

The packaging image of Aria's cultured meat slices on the dining table was generated using Midjourney's text-to-image feature. Aria's face was then swapped using Pica AI before being imported into Substance Painter to create the texture and material.

The posters on the school walls were generated using Midjourney's text-to-image feature, then further refined with ComfyUI. They were later imported into Photoshop and Substance Painter for additional texturing and weathering effects.

The video of goldfish and tropical fish swimming, playing on the television in the fish shop, was generated using OpenAI Sora's text-to-video feature.

The Guanyin in the video was captured through real-life photography and then converted into a 3D model with textures using Tripo 3D's image-to-3D generation feature.

The Jōkiryū (Pure Lapis) doll was created using Midjourney's image-to-image feature and then converted into a 3D model with textures using Tripo 3D's image-to-3D generation feature.

The advertisement playing on the television was created using Midjourney's text-to-image feature to generate the images. Aria's face was then swapped using Pica AI, and the final video was generated using OpenAI Sora's image-to-video feature.

The posters on the wall were generated using Midjourney's text-to-image feature, refined with ComfyUI, and then had faces swapped using Pica AI.

The texture images of the magazines on the bed were created using ComfyUI to generate the images, and then imported into Pica AI for face swapping.

The Jōkiryū doll on the bed was created using Tripo 3D's image-to-3D generation feature to generate the model and textures.

All the prints on Aria's outfits displayed in the showroom were generated using Midjourney's text-to-image feature. The faces were then swapped using Pica AI before being imported into Marvelous Designer for pattern layout and print placement.

The posters were generated using Midjourney's text-to-image feature, and then had faces swapped using Pica AI.

The Apple Sidra was created using Tripo 3D's image-to-3D generation feature to generate the model and textures.

The posters on the school walls were generated using Midjourney's text-to-image feature, then further using Pica AI for face swap. It was later imported into Photoshop and Substance Painter for additional texturing and effects.

The video playing on the immersive screen was generated using Hailou's text-to-video feature.

** Except for the assets mentioned above in the video, the following photo slideshow at the end of the video was entirely generated using the text-to-image functionality of Midjourney or Recraft.










Generative AI Tools:

- Midjourney
- Comfyui
- Pica AI
- Recraft
- OpenAI Sora
- Hailou

Prompt structure for Midjourney and Recraft text-to-image:

“19XXs hyper-realistic photography is on full display. The image depicts … Surrounding her are… The photo was taken in a…, capturing a … atmosphere. The … is depicted with a full presence, showcasing the photographer's attention to detail and commitment to realism. The setting adds a retro futurism touch to the scene.”

Declaration:

All images and objects generated through artificial intelligence (AI) in this creation have been carefully selected and edited by Yu-Shien Yang (hereinafter the Creator). The Creator bears full responsibility for the final output in terms of its content, quality, and legality.