

THE COLLAPSED SPACE

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A thesis presented to OCAD University in partial fulfilment of the requirements for the degree of Master of Design in Interdisciplinary Master's in Art, Media and Design. Toronto, Ontario, Canada, 2022

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ABSTRACT

'The Collapsed Space' is an open-ended and multidisciplinary research-creation piece exploring the complexities of diasporic identity through investigating my own personal lived experiences of being a Chinese Canadian American. Through virtual reality (VR) development as research-creation, this arts-based research uses auto-ethnographic practices to document generational narratives and personal memories into a VR experience, primarily through a process known as deep mapping used from the digital humanities. This thesis engages with the diasporic identity using methods including digital storytelling, deep mapping, expanding upon 2D images into 3D and 4D, and documenting responses and reflections on the research creation process through self-reflexive blog posts including feedback from my family members. Using the immersive power of virtual reality, this thesis seeks to also explore the ways in which the embodied experience can be used as a form of digital storytelling.

ACKNOWLEDGEMENTS

Thank you to my primary advisor Emma Westecott for her gracious wisdom and guidance throughout the entirety of this whole project. This would not be possible without her support.

Thank you to my secondary advisor Immony Men for his insight into the diasporic experience and accessing memories.

Many thanks to my family members, my mother Wang Liman and my father Liu Mingyao who supported me all throughout the pandemic. To my sister Elizabeth Liu, my trusted confidant and life-saving therapist.

In loving memory, I dedicate this thesis to my grandmother Wang Luhao.

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INTRODUCTION

I am interested in investigating how the spaces we inhabit - both physical and digital - can influence and shape our personal identity. To explore this subject further, I decided to expand upon my primary 2D image-making practice and venture into 3D modelling virtual reality creation. With my expansion into virtual reality making practices, my intention was to search for ways of deepening engagement with digital art making practices, using the power of embodiment that is unique to the medium. Virtual reality allows the viewer to feel embodied within the piece, enhancing the experience and thus leading to new ways of engaging directly with the creative work. With this unique potential, I wanted to observe the effect of what this embodiment would have on my family members and myself when reacting to this piece within virtual reality. Observing these reactions to the piece created new insights and perspectives about my own lived memories and experiences.

Using game engine software technologies, I explored how designers can imprint a feeling of physicality onto game objects that can be experienced and interacted with in a visceral and sensory way. I used auto-ethnographic approaches to my own making practices, incorporating self-reflexive documentation of my lived experiences as a second-generation Chinese person raised in a Westernised environment. Throughout my thesis, I explored the ways that digital making practices can be used to reconnect with my individual memories and Chinese heritage. This thesis explores the potential of virtual reality to convey the voices of marginalised creators in a compelling and immersive way. I have chosen to use virtual reality because I believe it provides a powerful method of positioning the player directly within the art piece.

For my thesis, I have taken the idea of the 'two homes' and collapsed them together into one place as a VR piece. As someone who identifies with being a member of the Chinese diaspora, this idea of '*home*' is one that we often question throughout our lives. Within the experience, as the player opens a doorway from my home in Canada, it will directly lead into the front courtyard of my grandmother's house in China. The inspiration for this was from the famous horror game demo for Silent Hills called P.T, created by Hideo Kojima and Guillermo del Toro.

RESEARCH QUESTION

During the creation of this thesis, I sought to answer the following.

'Can virtual reality be used as a tool to better understand diasporic identity for both the maker and their own familial audience?'

Throughout the creation of my thesis, this was the most prominent question that guided the direction of my research and the making processes. By selecting virtual reality as my primary mode for research-creation, I wanted to use the tools of VR creation as a way of better communicating my own narrative and lived experiences of my heritage. With the power of virtual reality's immersion and allowing the viewer to feel embodied within the piece, I was intrigued by the potential for possible reactions to the piece and whether it could invoke a special response from my family members as the audience. However, as I began to create my piece, I found myself becoming much more involved in the making process, discovering it to be a very rich and multi-layered experience. The documentation of this process and how it is used to better understand identity will be further outlined within this paper.

METHODS & METHODOLOGIES

RESEARCH-CREATION

This thesis serves as a way of generating new conversations and discussion points out of the questions that may arise from its creation. The creation itself will be used as a way of generating new research knowledge, and also act as a form of research in itself (Chapman and Sawchuk 16). As a creation-as-research piece, I will attempt to push the creative boundaries of virtual reality, while also offering analysis of the medium for creative expression for creative expression. The creation of my thesis has followed a very iterative process, going through several stages which progressively add further levels and dimensions to the representation of my identity in the work produced. Going through a conceptualization process, gathering reference materials, researching my personal family history, and using virtual environments to capture quotidian moments from my life have all gone into this immersive process of creating a living map of my memories.

To feel more viscerally connected to the creation, I made the conscious choice of 3D modelling every object inside of my virtual reality piece by myself, despite being easily able to purchase or source out assets online. Modelling each object allowed me to

reconnect with these spaces in real life more deeply. Even if the results from this conscious decision will most likely go unnoticed by the viewer, I wanted the final piece to feel as unique and authentic to myself as possible. I believed that sourcing each furniture asset from somewhere else would feel less authentic. My intention was to have the creation process feel as tactile and tangible as possible, even through using digital software to create these objects. Crafting and recreating each of these assets also allowed me to feel an emotional response to objects that I would otherwise consider to be mundane and insignificant. Maintaining a semblance of traditional art-making practices, such as using pencil, charcoal, or paints on canvas, was something that I believed would trigger new memories and emotional responses each step of the way. Often digital creation is criticized for feeling distant, computerised, and hollow in comparison to traditional mediums. However, I wanted to utilise the convenience and power of 3D software and game engines to create immersive environments, something that is not possible with my current practice rooted in two-dimensional illustration image making.

AUTO-ETHNOGRAPHY

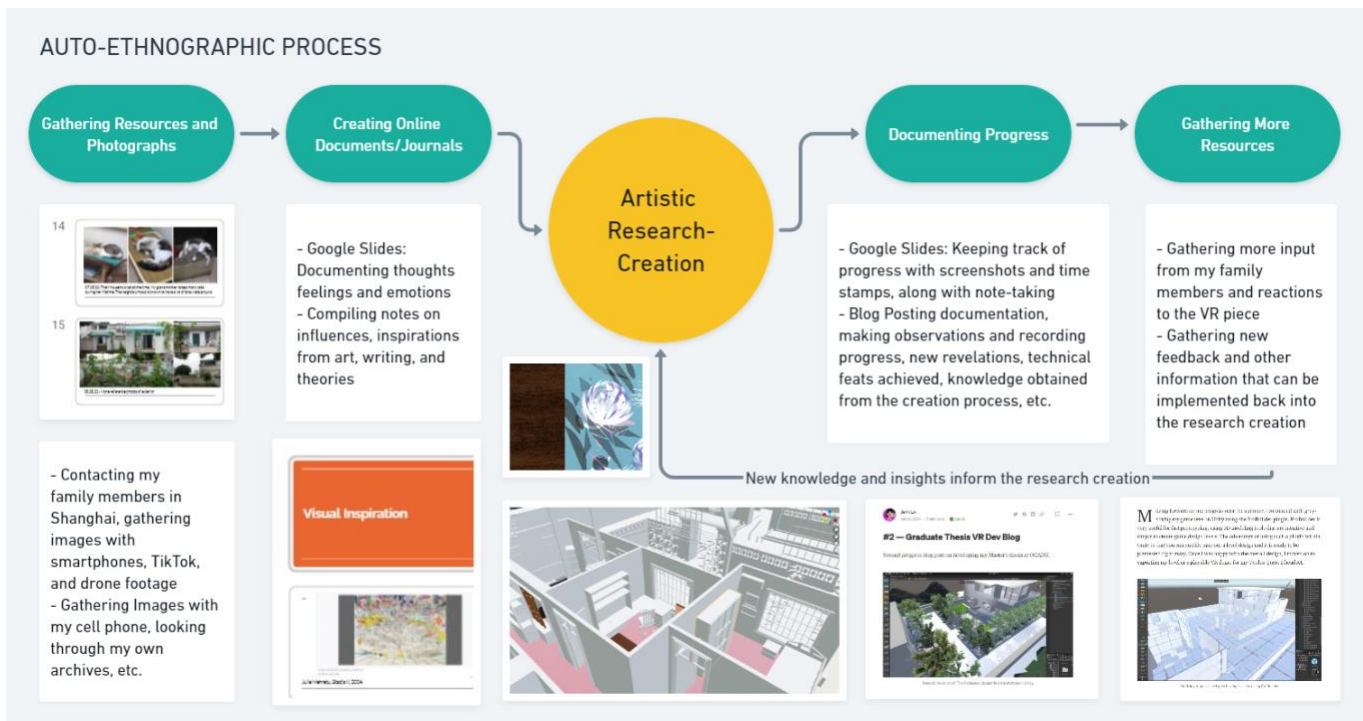


Figure 1 Diagram of my Auto-Ethnographic Process.

Methods of auto-ethnography used in this thesis will include using deep mapping practices to create a VR portrait of my lived experiences as a racialized person. Deep mapping is a practice that comes from the digital humanities where pluralistic voices are celebrated rather than an objective cartographical representation of place. The output of deep mapping is meant to create a media-rich format that recognizes multiple perspectives, deepening our understanding of place and revealing new insights about a location which are often linked to personal memories. While working on the development process of *The Collapsed Space*, deep mapping was used to formulate the structural components of the research-creation as shown below. As a result, this spurred many observations and discoveries at every stage of the process which created a lot of material for auto-ethnographic research. I would document this progress through recording screenshots, keeping track of observations worth noting, and writing regular blog posts every time a significant amount of progress was made.

Before starting my thesis, I spent a good amount of time gathering resources and references to use for this project. To help organize my thoughts, I created an online Google Slides file as a method of recording all the information and research I was developing. The Google Slides document was an effective way of keeping track of my progress chronologically and its open-ended nature made it easy to integrate and edit information at any time. As an auto-ethnographic method, I was able to record free-flowing thoughts, ideas, and initial feelings about the goals I had in mind about what I wanted to achieve within this thesis. The Google Slides format helped to encourage my thought process to feel more organic and free flowing, leading to more personal and honest insights (see fig. 2-4). Thoughts that I would record included writing about my feelings towards the spaces I wanted to investigate, the artistic direction I wanted to achieve with the piece, and the moods and emotions I wanted to express creatively to the viewer.

The Google Slides documentation served as an open online digital journaling tool that could be accessed and viewed by my supervisory team at any time as well. It included multimedia sources such as photographs and video recordings of my grandmother's space. I also included other images such as art inspiration sources, screenshots of diagrams to help with my deep mapping process, and as well as notes from other digital creation pieces, namely video games, to help inspire my research-creation piece. Through these initial stages, I found the Google Slide document to be an effective tool for spurring self-reflexive observations about living spaces in Toronto and Shanghai, the two

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06.14.21
"2 Houses"

- Travelling in between 2 homes - my home in Toronto and grandma's house in Shanghai
- These are the two 'homes' I remember the most within my life.
- Will spend the summer 3D modelling objects from both houses and the rooms. I think this will be a great way of increasing my familiarity with Blender. Referencing directly from real life is easier than creating from imagination at this stage
- A 'looping' experience where walking through one area will lead directly to the other house.
- As you travel back and forth, there will be subtle changes each time



Figure 2 An excerpt from my Google Slides documentation with free-flowing thoughts.

houses that have been the most formative for my identity within my life. After spending a significant amount of time within the past two years in the pandemic, my Toronto living space has become a closely intimate place for me. From not being able to travel for two years, I also longed for a way to somehow instantly be transported to my Shanghai just by simply walking through a doorway. This led to the early idea of wanting to create an art piece that could easily connect the two spaces, something that would be otherwise difficult to recreate in a gallery setting using any other techniques.

With the help of my family members who still reside in my grandmother's residence in Shanghai, my aunt's husband sent over photographs of each of the rooms, along with video clips using TikTok and footage recorded from his drone. The drone footage provided a dynamic view, recording aerial views of the property and the surrounding landscape of the nearby neighbourhood. Sourcing my own photographs of my grandmother's space, I searched through my own digital archives and found images that perhaps might appear mundane to any other viewer but held special personal significance to myself. These included photos capturing moments such as the orange tree in my grandmother's front yard, where my grandmother has grown many different plants throughout the years. Another fond memory I've remembered since childhood was seeing the cats my grandmother and my aunts raised every time, I revisited the space. During

the times I've revisited Shanghai, I've seen my grandmother raise multiple cats throughout her lifetime. The neighbourhood which my grandmother resides in has many cats around in the streets. Many households in that area allow their cats to roam freely as they come and please. Often when I reflect upon these memories, I think of these cats which have often been commonplace in her home.

After my initial phases of gathering data for reference materials of the two spaces, I would use my findings to start working on my research-creation piece. The development of my virtual reality piece required several stages, with many iterations in between. As I worked to create my piece, I would periodically take screenshots to document and record my process and add them to my ongoing Google Slides document. I also used screen-recording software to record footage of my 3D modelling process, in hopes of creating a timelapse video to compile the entire process for future reference (see fig. 5).

As I continued to progress through documenting the making of this creation, I began to discover that the research-creation process would inform the auto-ethnographic materials and vice versa, demonstrating a symbiotic relationship between the two. The research-creation would be modelled from the data gathered from the auto-ethnographic practices (see fig. 1). After a certain amount of work was accomplished within the making, this would generate material for observations that could be documented within the auto-ethnography. Each time new data was introduced or gathered within each of these research domains, it would help generate new knowledge that would help inform the other respectively. In the future, perhaps I would also like to conduct self-interviews and recordings of myself reacting to the piece while wearing the headset. The memories triggered from this experience are often difficult to phrase or express into explicit moments or words. Often these are based on very sensory experiences rather than actual concrete moments. Having an auto-ethnographic documentation of my own reactions to my own virtual reality piece and speaking freely through a recorded audio response would be an ideal way to encapsulate and communicate these emotions.



07.15.21: Their household cat at the time. My grandmother raised many cats during her lifetime. The neighbourhood is known to have a lot of stray cats around.

Figure 3 An excerpt from my Google Slides documentation 1.



07.15.21: Grandmother's House. The orange tree and potted plants were something I always recall. Shanghai, China, 2012.

Figure 4 An excerpt from my Google Slides documentation 2.

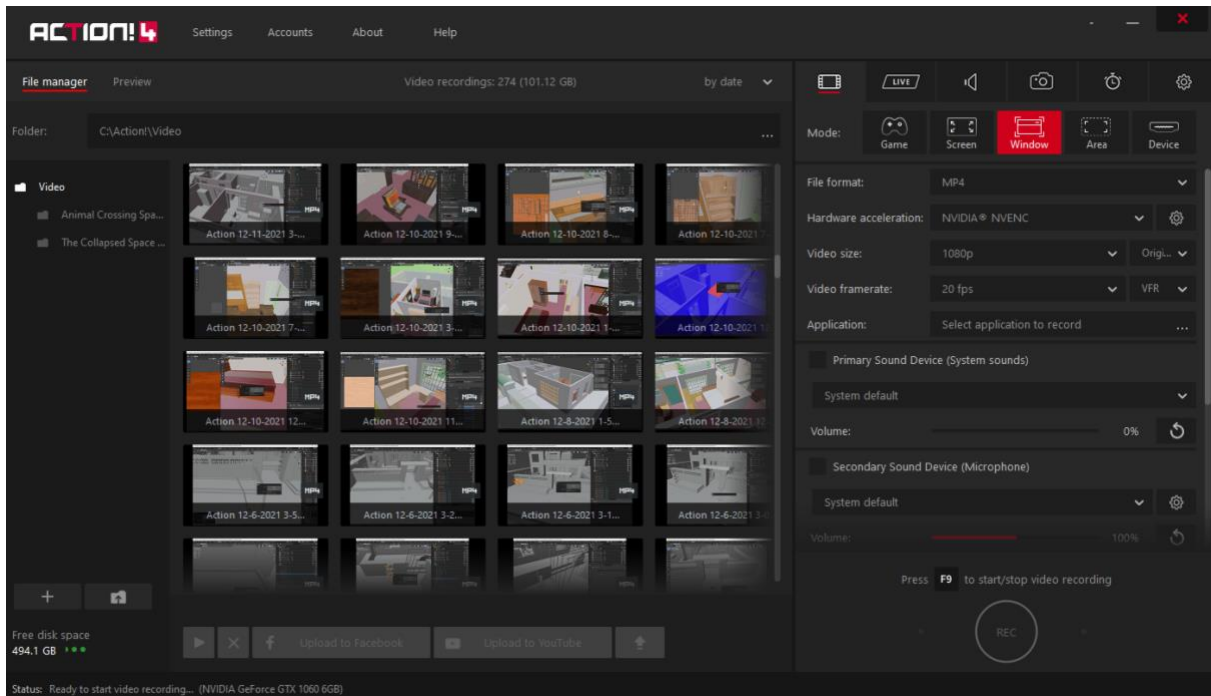


Figure 5 Screen-recording software documenting my progress

GAME DESIGN & PROPOSED FRAMEWORK

For this research creation, I have looked towards game design frameworks and practices to help inform the making processes of this piece. Before starting this project, I first went through preliminary stages of greyboxing the level design of the environment and establishing the layout. By early playtesting this prototype, this helped me with editing the space, figuring out which adjustments I needed to make and polishing it for virtual reality. While expanding upon my 2D image practice, I went through a typical workflow seen in 3D modelling creation going through the stages of greyboxing, 3D-modelling, texturing, lighting, baking, and then exporting the assets to a game engine software.

One of the frameworks that I looked to during these processes was a framework known as 'The Layers of Play Experience' as described in the book, *Games, Design and Play: A Detailed Approach to Iterative Game Design*. This framework describes the five iterative stages in which the player moves through when playing a game creation (Macklin, Sharp 80). It also serves as a model to think through when examining what game designers are asking for from their players (Macklin, Sharp 80).

The Five Layers of Play Experience are as follows.

The Sensory Layer: This layer deals with mainly the aesthetics of the game design and concerns itself with the look and feel of the experience. This reflects design choices such as whether the game is viewed from a first- or third-person view or how realistically the game world is represented.

The Information Layer: This layer of the design addresses how data and information is taken in by the player within the game state. Examples of this can be game objects that are available for the player to interact with, or even the ambient background sounds that are heard within the game's environment.

The Interaction Layer: This layer draws from the information obtained in the previous stage, where the player takes the information, they've accumulated and begins to understand the affordances they are allowed within the game. There is often a gap between how the game works and how the player thinks it works (Macklin, Sharp 86). It is up to the game designer to bridge this gap by considering the design of the actions, objects, boundaries of the play space, and most importantly how broad and deep the players understand the space of possibility to be (Macklin, Sharp 86).

The Frame Layer: The frame layer provides the broader interpretation of the play experience to the player, based on all the time spent living by the player, leading up to the point they play the game. This layer creates a frame around how the player perceives and experiences the game and allows them to build understanding from it based on their own experiences from real life (Macklin, Sharp 96). For example, if the game's theme is based on cooking, the game will create context or a point of reference for us to relate our personal lived experiences surrounding cooking to, all up until playing the game.

The Purpose Layer: The purpose layer is the final stage which leads to asking the question, why has the player decided to play this game? What do the players hope to get out of the experience? Are they looking to 'beat' the game and gain an achievement? Or are they looking to explore a game world and discover all its possibilities? They could also be seeking this game experience for the purpose of social interaction and finding new friends.

Within my own practice, I have decided to centre more of my attention more towards expressing the sensory, information, frame, and purpose layers of the experience within my thesis. Many of my decisions were based on establishing the aesthetics of the

space, providing context and information for the viewer to respond to, and thinking on how to best deliver the research I had collected, communicating it in a compelling way. This virtual experience does not follow game design in a traditional sense by choosing to focus on a specific aspect of this framework and omitting the layers that try to guide the viewer to follow a specific path outlined for them by the creator. The viewer may choose to look at certain objects or areas of the map that draw their interest, without being prompted to interact with a certain asset or complete certain goals to progress a narrative. There is no sense of progression that is involved, simply just a virtual environment that prompts the viewer to come to their own conclusions and interpretations of the piece.

While designing this creation during the initial stages of greyboxing, playtesting the area in virtual reality exposed me to areas that I felt needed to be improved. This included adjusting the spacing of hallways, considering the height of the ceiling, figuring out the ratio and scaling of each object, and considering the size of each doorway as well. I considered thinking of how the finished format would look, especially in the eyes of my family members from whom I wanted opinions the most. Although this format became more self-exploratory and used for generating personal research, there were still a lot of design decisions that needed to be made. This included thinking of the aesthetics and considering how my two-dimensional style would best translate into 3D and virtual reality. Due to the limitations of the hardware on the Oculus Quest 2 headset and my own skill level in 3D modelling, I chose to render the experience in a low-poly aesthetic, keeping the vertices count to an optimal amount for performance. To help guide my process, I consulted the official guides and documentation written by both Unity on Oculus on how to prepare a VR experience for the Oculus Quest 2 headset. There were other things to consider as well, which were specific to virtual reality design, particularly the viewer's motion settings which could either be set to 'Teleportation' or 'Continuous' mode. Teleportation allows the viewer to instantly teleport to an area within the environment, while 'Continuous' mode allows for more fluid movement through the space without feeling as stilted in comparison to the former. Continuous movement feels more natural in comparison to teleportation, however, can result in motion sickness more easily. Therefore, optimising these settings for the viewer's comfort is another factor that should be taken into consideration within the design.

Figuring out the layout arrangements took a great amount of consideration. Measuring out the distance and planning out the layout made me feel like an architect in some ways, using my imagination to plot out the placement of objects took a great amount of care and constant adjusting. Referencing the photographs, I needed to consider how

to translate every single piece I saw and figure out how to best represent it within the piece. The process made me hyper-aware of subtle differences in the architecture, capturing the design aesthetics of walls, curbs, sidewalks, rooftops, pillars, and shingles of each space. The level design of my grandmother's space was adapted slightly to encourage easier movement by adjusting spacing of the hallways, widening the sidewalk leading up to the entrance near her home, and considering the sidewalk areas surrounding the house.

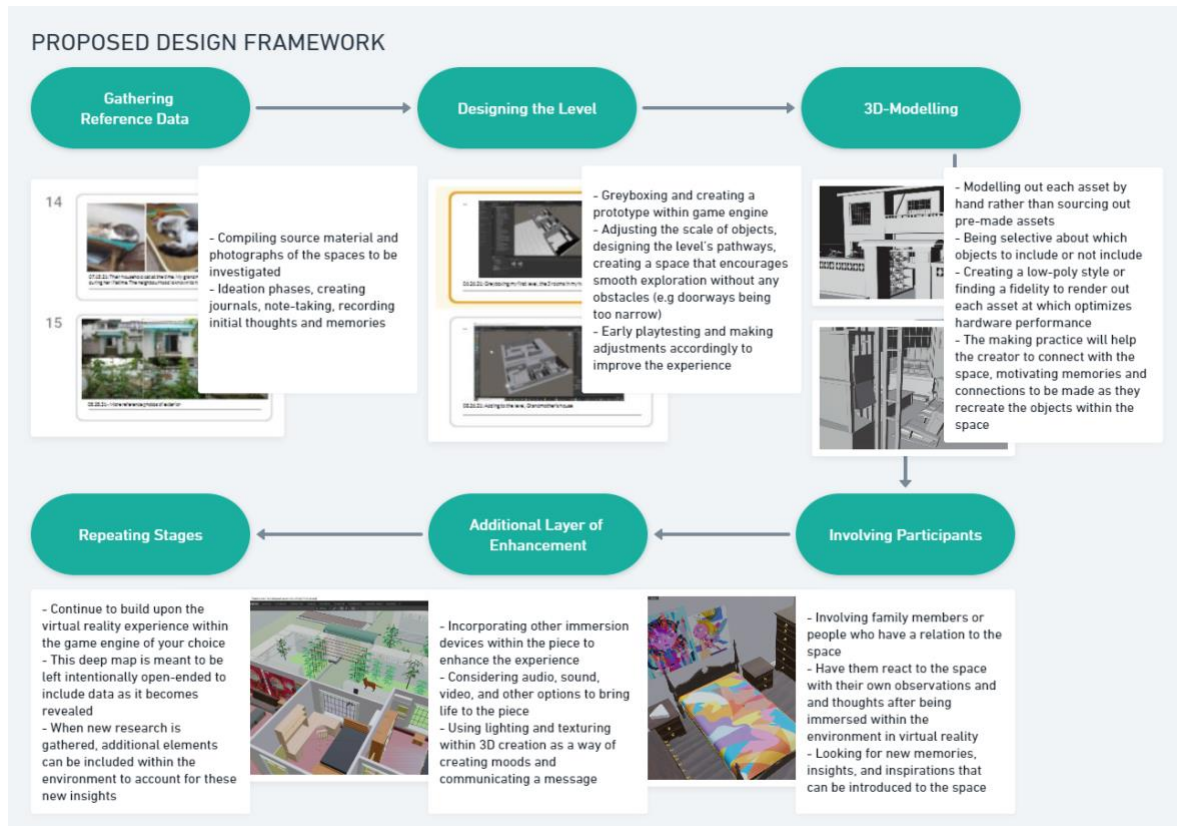


Figure 6 Diagram of my proposed game design framework.

After creating this research creation piece through gathering information, this is the framework which I have devised as a way for diaspora creators to reconnect with their origins and roots. The diagram above outlines the process that I went through to achieve my results. This design framework goes through an interactive process, where each stage is meant to inform the next. While designing the virtual reality space, it is important to consider factors such as how authentically the environment should be maintained to the

real-life spaces and thinking of how to seamlessly merge the two different environments. With my research creation, I decided to place more emphasis on my grandmother's space because it was the primary place that I wanted to reconnect with. Other design considerations should include thinking of how to create a space that will feel comfortable and authentic while being experienced by the player. Through gathering feedback from playtesting, this will expand upon the space and help inform new changes and edits that may be required.

Gathering feedback from family members who have a connection to the space will also be a crucial part of the process. Gaining new insights that contribute towards the development of the deep map will help shape the appearance of the map. The deep map should be left open-ended intentionally, welcoming new changes to be made and inviting insights to be added as additional participants react to the space with their new interactions. Using the power of virtual reality, this power of embodiment is meant to help assist with creating context and spurring reactions, creating points of conversation to lead to further insights. Making use of this unique property of virtual reality made it an effective way of gathering information and research from my family members as the audience.

CONTEXT OF THE WORK



Figure 7 My grandmother Wang Luhao.

Speaking on my personal family history, my parents first immigrated to America as research scientists in the late 80s from Shanghai, China. During that time, the United States had decided to open their immigration policies to encourage global academics from overseas to come to America. I was born in the States in Buffalo, New York as a young infant and shortly after our family moved to Canada where I have subsequently spent the rest of my life. From a young age, I have constantly been exposed to Chinese culture in small doses while simultaneously being raised in a Western environment. Whether it was through the food we ate, speaking both Mandarin and English at home, hearing stories from my parents about my relatives in China, or through the Chinese decor in our household - Chinese culture surrounded me. During my childhood there was a brief

amount of time where I was fortunate enough to live with my grandparents on both sides of the family who came to live with us from China.

My interactions with them during that time are some of my fondest memories, living my everyday life with them and watching them interact with Canadian culture. For my grandparents from both my father and mother's side, it was their very first time ever travelling outside of China and visiting the West. Living with my grandparents, I would remember moments of seeing my grandfather walk up the flight of stairs of our apartment building every day for exercise. He could also speak a bit of English from learning it on his own, something that I remembered as impressive. Wang Luhao, the name of my grandmother on my mother's side of the family, was the one who I spent the most time with during my childhood. I have fond memories of her taking me to school and looking after me while my parents were away working. Out of my extended family members, much of my childhood was spent with her.

When my grandparents returned to China, I would revisit them every few years or so whenever it was possible for us to travel back. Every visit was very special for me, being able to slowly become acquainted with my family members. I would remember spending time with them during Chinese New Year (or Spring Festival as it is called in China), the time of year when Chinese families will gather and reunite to celebrate. We would spend time with each other eating food, sharing stories, watching the performances on television, and going out and venturing into the city. My grandmother would share her artworks with me as a way of bonding over our mutual interest in painting. I always remembered my grandmother living in Shanghai to be a kind and benevolent woman, who was patient and loving with everyone around her. Although I struggled with the language barrier between us, I could tell that she felt a strong connection with me and tried her best to show her affection. Familial interactions and bonds spent with each other built up of quotidian moments were the quiet ways I learned to engage with my culture throughout my lifetime. My grandmother was a survivor of lung cancer, fighting it many times throughout her lifetime. It would reappear many different times, and yet each time she would continue fighting it off with grace and perseverance. Unfortunately, during the start of the pandemic she passed away from lymphoma and we were unable to attend her funeral. Pursuing this project's objectives was also my way of remembering her passing and keeping her memory alive.

Although being Chinese has always been an intrinsic part of my identity, trying to negotiate between two different cultures and accepting my multiplicity has also been a

part of it as well. Being raised in Toronto, I was also fortunate enough to be raised amongst a diverse population, experiencing many different cultures while embracing my own that I could identify with as well. However, I have always felt the constant internalised guilt of not fully being able to speak my language fluently, feeling the divide between myself and my culture. This plight is not uncommon within many diasporic communities, regardless of which country of origin they come from. There is often a debate on how authentically the diasporic individual is still connected to their heritage despite being raised in a land outside where their culture originates. Using deep mapping exercises and digital storytelling approaches I iteratively designed and built a VR experience as a way of expanding upon and expressing my Asian-American identity to make a piece that encompasses more than what can be defined within national borders.

THEORETICAL DOMAINS

DIGITAL STORYTELLING OF THE DIASPORA

This thesis grapples with notions of place, seeking to explore the possibilities of what a digital place can represent for the diaspora. The diasporic relationship to place is constantly contested, often questioning their position within society, and living an in-between existence. Rather than have the notion of place be representative or bound to geographical or historical ties, through the creation of a virtual reality piece I would like to shift the notions of place to become ideological battlegrounds, divorced from the geographic and historical ties that embrace them both (Bodenhamer et al 15). With my own personal narrative, I have often questioned the connection between my Chinese identity and its place both within the Western and Eastern landscape. However, by creating an expressive environment within virtual reality, this creates a place that is open to interpretation. By purposely abstracting and expanding notions of place, it liberates identity to not be intrinsically tied to place as a geographical location, but rather place as a representation of personal narratives and emotion. The Collapsed Space was made with the intention of exploring memories of a familial experience, without striving for an accurate representation of what it truly means to either be Chinese or Canadian rooted in objectivity.

In *'Deep Maps and Spatial Narratives,'* the authors describe the notion of place as a carrier of culture which implies that no one class or group controls it and that they are particular and inclusive, 'organised worlds of meaning' characterised by experience,

emotion, and memory (ibid et al 14). The text centres around transforming our ideas of cartographical maps and their functional purpose to go beyond simply representing objectivity and using them as a device for complicating the notions of place to encompass multiplicity and a deeper sensory connection. For the diaspora, place is not merely a location but also creates context that contributes to our sense of identity, and therefore mutability and changes to our sense of place can create a profound feeling of confusion and unsettledness (Zheng 20). Referencing Su Zheng's text, *'Claiming Diaspora,' she states that, 'One's primordial anxiety and fear of losing oneself by losing one's "home"—that "permanent address" one identifies with all its cultural, historical, and environmental characteristics, thus making it part of oneself—either through physical dislocation or social or cultural dislocation, compel us to reconsider the limits and potential of place. We find that we cannot yet do away with two simple but vexing questions: "To which place does this culture belong?" and "To which place do I belong?"* (Zheng 20)

Concepts of culture and cultural difference are largely dependent on notions that each country embodies its own distinctive culture, and that world culture occupies the discontinuous spaces of nation-states ruptured by borderlines (Zheng 20). However diasporic identity convolutes this idea through the displacement of cultures through border inhabitants and border-crossing populations, cultural differences within a single locale, and hybrid cultures (Zheng 20). The concept of 'Asian America' should not be considered an amalgamation of all the single ethnic groups of Asian origin nor should it be thought of as a teleological end of all Asian ethnic groups in North America (Zheng 13). Today's Asian American communities are constantly negotiating with these two categories of identification, calling into question the transformative meaning of 'Asian American' identity. In response to this questioning, I wish to add my own voice to the discourse on Asian American identity by creating my own space within virtual reality. My experience reflects one who has been raised predominantly within the West, experiencing my culture by proxy mostly through my parents, Asian pop culture and media, and Asian culture imported and made accessible through Toronto Asian community establishments. As I enter adulthood, I have slowly begun to reconnect and develop a heavier interest in re-engaging with my culture and language. This has slowly influenced my main creative practice within illustration as well, culminating the visual inspirations I have been exposed to throughout my life.

Within my research, I followed a line of reasoning that posits that place is an open and hybrid concept, a product of interconnecting flows and not something that is rooted or fixed (Bodenhamer et al 16). In response to this concept, I created a VR space that

would break up the definitions of identity linked specifically to geographically defined borders, recognizing how complex cultural identity can be. We need to ask ourselves how to deal with cultural difference while abandoning received ideas of localised culture, underlining the necessity for understanding social change and cultural transformation as a situation within interconnected spaces and rethinking cultural difference through connection (ibid et al 16). According to the text, weakening the representational function of space produces little sense of permanence, history, or material investment, and what is left aesthetic, affective, and openly political. (ibid et al 107). Opening and loosening these ties between space, place, and culture, by weakening the ways in which all three are entangled can pave ways for new identities and validate the existence of hybrid narratives and storytelling.

By creating a computational place inside of VR, this creates a new digital space that can encompass this hybridity, communicating the intergenerational changes amongst my family. *'The Collapsed Space'* goes on an ambitious journey to try and encapsulate narratives that span across my grandmother's life as a senior, along with my life into adulthood within a Western country. By collapsing these different cultures amongst generations within virtual reality, this creates a space that allows my family's narratives to converge, creating new insights and discoveries. In *'The Collapsed Space'*, I use images, memories, narratives, and artistic expression to create a virtual reality space as my deep mapping process. Throughout my virtual reality development process, I have combined as many aspects of my identity in the construction of the virtual reality environment as possible. This will be explored further in the later portion of this paper, with observations made from 3D modelling the furniture, the inclusion of certain items, and the exploration of incorporating illustrations and textures within the piece. To further explore my own personal narratives, I have chosen to use a method known as deep mapping to collect my experiences. The resulting VR experience will embody the essence of deep mapping and portray my lived experiences in a compelling way that can be experienced firsthand through the eyes of the viewer.

DEEP MAPPING USING DIGITAL MEDIA

"Deep mapping" is a term used in the digital humanities to describe an approach to recording and cataloging *place*.

Deep maps are:

- Pluralistic — hold multiple voices
- Process-oriented and open-ended
- Include ambiguity

WARM UP: Time travel

2 min


Close your eyes for a brief mental trip through time.

Take a deep breath.

In the spot where you're sitting, imagine what it was like 500 years ago, today, 100 years ago, 10 years ago. What would have been there? Who would have been here?

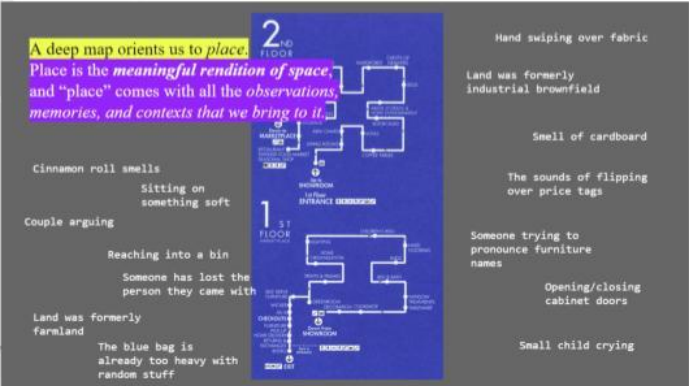
A **deep map** includes information beyond a two-dimensional depiction of geography and labels.

Deep maps include information that has to do with *the experience of a place*.



What other names has the land been known by?

A deep map orients us to *place*.
Place is the *meaningful rendition of space*, and "place" comes with all the *observations, memories, and contexts that we bring to it.*



Map	Terrain Place names	Cartography
Deep map	Stories, folklore Memories Intuition Interactions Natural history Time	Sound Images Interviews Literary texts Weather

Figure 8 Slides from Jayme Yen's 'Welcome Mapping Within Zoomspace!'

A primary method that I have chosen to guide my research creation is a framework known as deep mapping. Deep mapping is an ethnographic practice that acknowledges that space is not only physical but existing from memory, imagination, and experience (Bodenhamer et al 2). A deep map can be defined as a multimedia space that leads to the creation of spatial narratives and further deductions to be made from its endless connections (ibid et al 3). Deep maps do not explicitly seek authority or objectivity but instead are framed as a conversation and not a statement, and can continuously change in response to new data, perspectives, and insights (ibid et al 4). Deep maps embrace multiplicity, simultaneity, complexity, and subjectivity, allowing multiple voices, views, and memories to be seen and examined at various scales (ibid et al 5).

Over the summer before I started to develop my thesis, I was able to participate in a deep mapping workshop led by graphic designer Jayme Yen. This is where I first became acquainted with the concept of deep mapping. This workshop was conducted using a Google Slides document, open for its participants to add information, thoughts, memories, and feelings in a free-flowing manner. The prompts included asking us to map out our definitions of how we viewed Toronto as a place. We were encouraged to map it out through unconventional means, creating a map based on places where we

WARM UP: Where are you looking?

5 min

Part 1: Eye-gazing

Find your partner from the drawing exercise. Pin their video feed to the screen.

Take turns looking into each other's eyes. **Screen names starting with A-M:** look directly into your camera (get up close to your monitor if you need to), while **screen names starting with N-Z** looks at your partner's eyes as they appear on the video feed. Stare intently for 30 seconds.

Switch.

Part 2: Eye-pointing

In the same pairs, **screen names starting with A-M** look naturally at your Zoom window. **Screen names starting with N-Z** using your finger, try to follow your partner's line of sight and point to the part of your space that your partner's gaze seems to be aimed at.

Switch.

(Unpin the video when you're through, and return to Zoom gallery view.)



Smells like...

Find an image on the internet that depicts what you think this Zoomspace might smell like.

Tools: Internet search
Time: 2 minutes

Feels like...

Imagine the weather of this shared neighborhood. Use an image, text, or drawing to represent this weather.

Tools: Internet search, drawing, text
Time: 2 minutes

Tastes like...

Find an image on the internet that depicts what you think this Zoomspace might taste like. (This is our Potluck!)

Tools: Internet search
Time: 2 minutes

In this workshop, we will:

- Share more about ourselves and our spaces than we typically would
- Observe and Explore this communal time-space (the pop-up neighborhood)
- Map our experience in this collaborative document (Google Slides as a deep map of the 'neighborhood')

Figure 9 From Jayme Yen's 'Welcome Mapping Within Zoomspace!'

creating an accurate cartographical map of Toronto for practical or functional purposes. The result was a rich tapestry of emotions collected from many different individuals in a collective attempt to capture the essence of living within Toronto. These experiences were varied, personal and unique to each person involved, built upon many little moments. Some people chose to map out a specific route of their daily commute, while others highlighted their favourite parts of the city that held special significance to them. The Google Slides document made it possible for all forms of expression to be included. People chose to map out their experiences through a variety of ways. This included written text, hand drawn doodles, diagramming practices, and dropping images into the document.

In the deep map, we understand space and place as the product of interrelationships, coexistence, and process, always changing and always in the state of becoming (Bodenhamer et al 22). The representation of place through the rich practice of deep mapping was something I found to be highly relevant to my research goals and interests. Deep maps seek to disentangle the multiple realities of human experience by allowing a heterogeneity of voices to speak in ways that do not prioritize or emphasize one way of knowing over another (ibid et al 224). They are intentionally subversive,

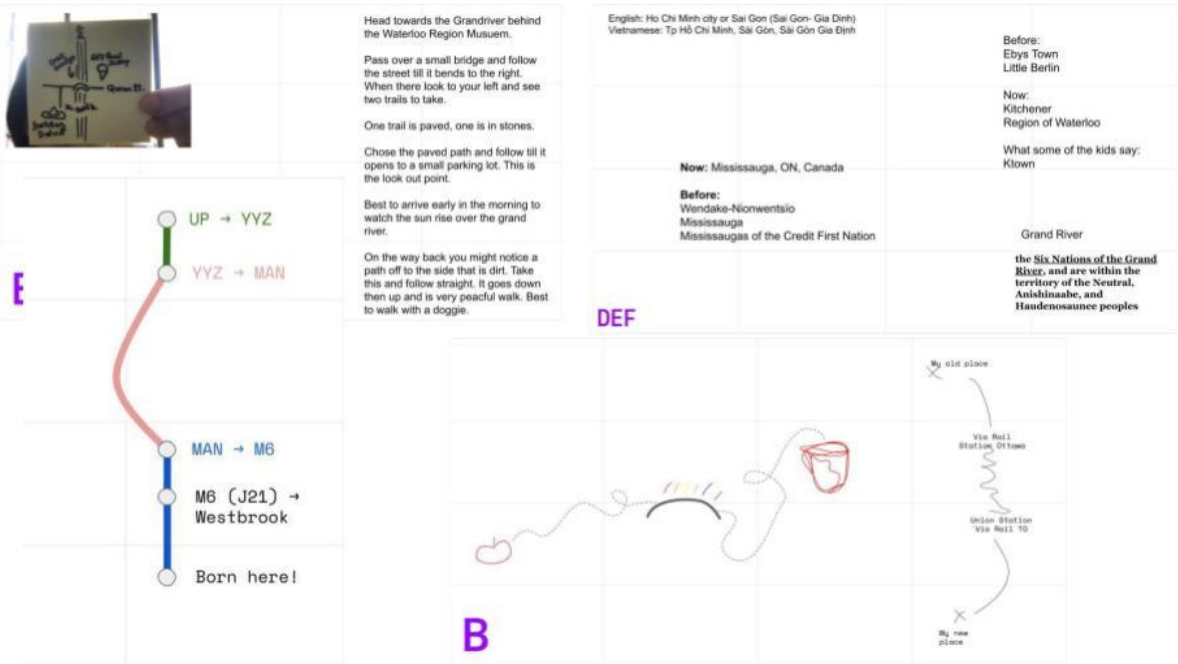


Figure 10 Jayme Yen's Group Deep Mapping Exercise.

imprecise, and reflexive; containing a plethora of voices, diverse experiences and worldviews to be expressed through spatial stories, narratives, and conversations (ibid et al 224). Throughout the creation of my piece, this thesis has aimed to draw connections between multiple perspectives and viewpoints, primarily gathered from my own personal memories from childhood up until adulthood and from my mother's own recollections of her mother as well. I was attracted to the way that deep mapping values multiplicity in stories to be heard, allowing me to draw connections between my lived experiences and the narratives of my family living in Shanghai. This research-creation is meant to be an on-going piece, intentionally left open to the inclusion of new perspectives as time goes on. In the future I would also like to gather more perspectives from the rest of my family, particularly from my oldest aunt who spent the last 30 years of my grandmother's life caring for her and my youngest aunt on my mother's side of the family who also resided with them.

Diasporic identity is one that is characterised by its multifaceted nature and an existence that is often caught living 'in-between' separate cultures. There is often a struggle of whether one's identity within each culture can be considered authentic or fully accepted within each space. However, with globalisation on the rise, the concepts of idea

and heritage continue to be contested with and redefined. This is what makes deep mapping such a fascinating and enthralling practice. Much like diasporic identity itself, deep maps are intentionally open-ended, encompassing multiple perspectives and therefore making them well suited for the study of humanities. They are structurally open, inherently unstable, and continuously unfolding and receptive to changes in response to newly discovered data, perspectives, and insights (Bodenhamer et al 21). By choosing to represent and explore my diasporic identity through the flexibility of deep mapping, this has allowed me to explore my identity freely, without the concerns of justifying the validity of my voice. It is a liberating practice that acknowledges that there is no one authoritative voice or narrative that takes precedence above all others. Deep mapping is a practice that recognizes complexity. Every deep map reflects and contains more than one viewpoint, expressing a diversity of voices and worldviews (ibid et al 136). The aim of this practice is to not seek out objectivity or authority but rather express a negotiated conversation between insiders and outsiders, experts, and contributors, over what is represented and how (ibid et al 21). These lived spaces between Toronto and Shanghai encapsulate years of quiet everyday moments, stories, and narratives that combine to form different similar and contrasting identities. The deep map does not privilege one way of knowing over another or force a premature reductionism but allows for complexity and competing outcomes to emerge (ibid et al 224).

By forming a creative space that allows for multiple narratives to take place, deep mapping becomes a host for generational voices to interact with one another. In the text, *'Deep Mapping and Spatial Narratives'* it states that in their essence, deep maps are the means by which we represent the contested meanings of space and place (Bodenhamer et al 21). Unlike conventional cartography which is based on objectivity, deep maps involve negotiation and contestation over who and what is represented and how, giving rise to debate about the documentation of people and places (ibid et al 39). An interesting point of contention between my mother and I was my initial design choices for the illustrations used as textiles for the curtains within my grandmother's main living room. My original intention was to import my 2D illustrations as a way of artistically integrating my presence within my grandmother's house. The original design I had in mind included recognizable elements from my style including geometric pattern and a strong vibrancy in colour. However, when presented to my mother for her feedback, her reaction was an unenthusiastic one, almost to a point of feeling offended. My mother felt as though my illustrations felt out of place and did not fit the context of the environment. Despite the normalcy of the main living room area, consisting of a few couches, a coffee table, air

conditioning unit and a television set, it was interesting how this place could spark such discussion between the two of us. After negotiating a solution, we were able to arrive at a decision on a curtain textile choice that could respect the environment from both of our perspectives. Instead of having lively characters within the design, we decided to remove these motifs and keep the design more simplistic. The vibrant red colours were changed to a less saturated light blue, which was my grandmother's favourite colour (see fig. 11) My mother had a similar reaction to a furniture chest that I had placed near the television set in the living room. She found the colours and patterns to be too vibrant and juvenile, making it very distracting within the environment (see fig. 12)

This interaction gave me the realisation that my mother's feelings and relationship to my grandmother's house is another very valid and authentic lived experience that needed to be included within the deep map also. My mother's feedback emphasised the unstable, fragile, and temporary nature of the deep mapping process, expressing itself as conversation and not a statement (Bodenhamer et al 39). Differing from conventional mapping practices, deep maps present information more qualitatively in a rich and layered way. More than just a technical exercise, deep mapping is a process that is imbued with powerful political implications, created with the intention of changing the world that they



Figure 11 Bright red curtains that my mom didn't approve of.



Figure 12 Cabinet with my illustration textures, feeling out of place.

represent (ibid et al 136). Complicating the notions of place-bound identity and breaking up the monolithic perceptions of each culture will cause us to recognize the emergence of these interconnected spaces and validate the existence of hybrid identities.

Using this as a method for expression of my identity, gives me a sense of agency over my representation and lived experience. It also recognizes my identity of being a Chinese Canadian individual as an entity that is distinctly its own. It is an identity built on the feeling of not belonging to any one specific culture, but rather a culmination of many unique experiences that complicate the definitions of every culture it is connected to. By including my mother's perspectives and gathering input from my other family members, this has added further dimensions to not only my own identity, but also has contributed to my own understanding of my grandmother as well. This virtual reality space incorporates the viewpoints of not only how I have perceived my grandmother's life and my memories connected with her space, but also how my own mother perceived her mother's experiences as well.

POSITIONALITY WITHIN VIRTUAL REALITY ENVIRONMENTS

Deep mapping is a powerful process that can take many forms. It is an open-ended practice that can be approached in numerous ways. I believe that virtual reality itself is inherently a powerful tool that is well suited for this kind of research and exploration. Deep

maps allow the user to go from simply observing the material world to engaging with it, seeking to capture an essence of place and humanistic sense of distance, direction, and identity (Bodenhamer et al 23). Within a virtual environment, there is an immediate feeling of proximity and power on the part of the viewer that can feel intuitive and innate (ibid et al 19-20). With heightened senses of engagement, this allows for observers to become immersed within the body of work, leading to new perspectives and responses to the information being presented. I believe that virtual environments have the potential to go beyond conventional uses of mapping and can be used as a method to further the deep mapping process. Gaming engines offer ways to reconceptualize the role of space in the humanities by privileging agent-based exploration rather than linear movement as a means of discovery (ibid et al 19). In the text *'Deep Mapping and Spatial Narratives,'* the authors argue that *'Spatial stories in this environment are "held together by broadly defined goals and conflicts and are pushed forward by the character's movement," not by the structure of an argument. Truth and authenticity are measured not by standards of causality but by the game's ability to "conjure up experiences of space" that expand and improve our understanding of a complex and multifaceted reality'* (ibid et al 20). This emphasis on free-flowing movement that prioritises the agency of the user to engage with this digital space is what allows for new perspectives and insights to be generated, in response to this structurally open deep mapping piece. The text also mentions that the style and structure of game engines can contribute significantly to this discussion of spatial stories because they invariably require the user to create their own spatial journey through an imaginary world (ibid et al 45).

Usually within the context of storytelling in video games there is a structured theme where the story often unfolds in the form of a quest or a journey to achieve a series of goals within the defined geography and resources of a virtual scene (Bodenhamer et al 45). Rather than a conventional 'game' experience that follows this structure of objectives required for a player to complete, I have used virtual reality and game design practices as an ethnographic process to explore and gather personal memory. This was accomplished during the 3D modelling creation processes which led to personal discoveries, informed by the reference data I gathered from family members and receiving further feedback from them after observing their reactions to the piece within virtual reality. Traditional video game storytelling is often bound by a series of rules and objectives set up within mechanics and gameplay. However, in contrast to this structured storytelling format bound by specificity, I have deliberately chosen to create an open and exploratory VR place. My intention for *'The Collapsed Space'* was to allow the 'player' to

walk freely within the virtual space, without any set goals or specific tasks needed to progress the level. To borrow the language from within gaming, this produces a “sandbox” in which users can move freely anywhere and for any purpose (ibid et al 45). Granting this sandbox-like agency to the player’s movement and enhancing their experience with virtual reality is intended to allow exploration of oral and life histories, biographies, and emotions.

The ability to recount multiple realities and to give voice to multiple groups is a critical element in deep mapping and spatial storytelling for it begins to break down the considerable emphasis given to metanarratives and to universal truths (Bodenhamer et al 41). Within spatial storytelling, the positionality of the storyteller is critical in terms of whose story is being told, to whom, and for what purpose, for ultimately the storyteller seeks to deliver a message to the viewer (ibid et al 41). To answer the question of who this creation was made for, I would posit that this project has mostly been done for myself more so than for a specific audience in mind. It was a method of documenting and preserving my memories, serving to help me reconnect with my past and express my lifestyle of living between two different worlds. From when I began my early playtesting stages of making the first iteration of the level, I could immediately sense the immersive power of being embodied within the piece. When I was placed inside virtual reality, I immediately felt as though I was there myself. Despite how primitive the rendering felt, not being fully realised to the highest fidelity at that stage, walking through specific angles within the piece made me think back to moments in time. This gave me a method of speechless storytelling, communicating an environment to the viewer. As I entered my virtual reality space for the first time, I was reminded of moments of gathering and sharing meals at the small dining table, reconnecting with my family overseas who I normally wouldn’t be able to share this daily ritual with regularly back in Canada without their presence. I was reminded of the oddly shaped doorways and narrow hallways of the first floor of my grandmother’s house. I was reminded very viscerally of the atmosphere of being within the house, gathering my lived memories within my second home.

The embodiment of walking through each room within my grandmother’s house in virtual reality brought back not only temporal memories but also sensory experiences as well. I recall feelings such as the intense summer heat, the outdoor sounds of cicadas, and the number of mosquitos during the evening from the humidity. I remember the summer heat being so intense as a child, with a higher intensity felt than in Toronto. We would stay indoors within one room inside my grandmother’s house, which was the only room that had air conditioning. Air conditioning was often a huge necessity to survive the

sweltering temperatures in Shanghai. I would remember slowly trying to decipher conversations with my family members, trying to communicate with my grandmother to show my affection for her despite not being fluent in Chinese. There were many nonverbal ways that I felt my grandmother's affection, with small events such as taking walks around her neighbourhood, petting her cats, watching her draw with ink brushes on paper, or just simply watching a television show together in her bedroom. This visceral and sensory quality of virtual reality despite lacking actual sound or smells within the piece, added another layer of dimension of interactivity, simply by feeling like you could venture directly into the creation itself. As a creator engaging with her own work in this way, this brought a plethora of re-lived experiences.

By extending this piece to incorporate other voices and other perspectives, this has deepened my understanding of self, opening perspectives that may not have been apparent to me before by simply relying on my recollections alone. Introducing this piece to my younger sister, she felt a similar connection to this space, even though her experiences with my grandmother have been limited in her lifetime in comparison to mine. Like myself, she also felt an immediate resonance to the environment even from just viewing the piece. Seeing specific objects and scenes evoked an emotional response within her. However, she commented that perhaps these special feelings of closeness may not necessarily feel as visceral and vibrant to someone who has no relation to the space whatsoever in real life. Regardless of what outsider opinions may be in response to this piece, I believe that the positionality of placing them directly within an environment will cause them to empathise with the narrative that is being presented before them. As a creator, I would like them to make their own unique observations between sensing the dichotomy within two culturally different spaces.

Immersing myself within this piece also enabled me to empathise with the viewpoint of my family members living within Shanghai. This was something I experienced both within the making practices and during the early playtesting stages. I would try and imagine the lives that were being led there, envisioning their stories and narratives that went on daily in my absence. Standing in the garden within virtual reality, I would try to see things from my grandmother's perspective as she led her daily routine there. She led a quiet life during her retirement, often spending time on the porch with her cat, gardening in the front yard, and speaking with the other elderly women in her neighbourhood. Observing my mother and father's reactions to the piece, it also triggered certain memories within them as well. For my father, when viewing the spare bedroom on the first level, he shared that it was the room that he and my mother first lived in during the

early stages of their marriage in China. For a time, before they had their own place, they lived in that part of my grandmother's house, buying some of the furniture that still exists in that room until this day. The room that was used by grandmother until her passing was occupied by one of my other aunts, while my grandmother and grandfather used the room upstairs on the second floor. This was a memory that was surprisingly forgotten to my mother but something my father had still retained.

For my mother, seeing the room that my grandmother used, reminded her of seeing her life change slowly as she continued to age. When walking up the flight of stairs became too much for her, my grandmother's bedroom was moved to the first floor. My grandmother's health slowly began to deteriorate as time went by, this being most evident in the changes with her bed, shifting from a regular bed with a mattress to a bed with railings to help her get out of bed in the morning. The bed would also have mechanics to help prop her back up when she wanted to watch television in her room. Before when her health was better, she would often enjoy watching television in the main room, but as her legs became weaker, she eventually would remain in her own bedroom instead. The washroom on the main floor which was located close to her bedroom also underwent changes as the years went by. As she got older, there were railings added within the shower to help assist her as well. Eventually she would need the use of a wheelchair to help her move around the house. However, before this point in time, my grandmother tried to be as self-sufficient as possible. She never complained about her situation, or her deteriorating health, constantly walking around as much as possible even as her mobility deteriorated throughout the years. After viewing this space in virtual reality, my mother commented on the fact that she suggested to her sisters that they all contribute towards buying a new house for my grandmother to live in, however my grandmother declined the proposition. She didn't want anyone spending any further money for her if it wasn't necessary and was willing to continue living in that house until she passed. This is also how I remember my grandmother's personality to be in my memory. She was always very selfless and kind to those around her, with a quiet yet determined personality. Despite her condition, she never felt bitter about her life in her old age and continued to live every day with content and meaning. VR acted as a trigger for these memories to take place, allowing my parents to tune into their own lived experiences which may have been lost to them over the years.

Currently there is still much to be developed within the piece, as there are many stages involved in the creation process. This project is ambitious; however, I believe my progress has established the foundations for multiple narratives to be included in the

future. With the open-ended format created with the use of a game engine, e.g., allowing for the possibility of audio and video to be added can further enhance the range of voices included. Or perhaps by sharing with my family members and extended family, this research can continue to generate effective points of discussion amongst our relatives as they wander within the environment. To prompt discussions that are as broad and universal as possible, I may limit my 'voice' within the piece and keep the environment neutral. This is to maintain the deep mapping stance that acknowledges that one voice does not take precedence over others, allowing for a pluralistic approach to memory. If this piece were to be viewed by any one of my family members, most likely their individual viewpoint will be maintained from their own perspective, instead of trying to empathise with my own interpretation of the piece. They could recall their own personal memories of the place, rather than try to adopt my own standpoint, or perhaps try to embody themselves within my own experiences and interpret the piece through my personal lens as well. My goals are to continue revisiting this place within virtual reality as I continue to add more elements to it, compiling more of my memories and other details as time goes on. As I progress, I will continue to gather insights from my family members once again as part of the research process.

LISTENING TO IMAGES & MEMORIES OF THE DIASPORA

Listening to Images is a compelling text by Tina Campt, who suggests that there is much to be learned and extracted from photographs by choosing to 'listen' to them rather than simply looking. This method of recalibrating vernacular photographs as quiet, quotidian practices gives us affective registers through which these images enunciate *alternate accounts of their subjects* (Campt 5). Campt encourages the viewer to seek out the 'lower frequencies' of these images, allowing a deeper engagement with forgotten histories and suppressed forms of diasporic memory (Campt 6). Campt posits that there is value in examining trivial, banal, and mundane everyday practices that often go overlooked, and that these are *'in fact essential to the lives of the dispossessed and the possibility of black futurity'* (Campt 8). Making the active choice to listen to images rather than simply looking at them is a conscious decision to challenge the equation of vision with knowledge by engaging photography through a sensory register that is critical to Black Atlantic cultural formations: sound (Campt 6). Through tuning in and attending to the 'lower frequencies' of these images, it is through sound that we can seek a deeper engagement with forgotten histories and suppressed forms of diasporic memory (Campt 6). Campt theorises that sound as an inherently embodied process that registers at

multiple levels of the human sensorium and invites the viewer to invoke a counterintuitive approach to perceiving sound (Campt 6). According to Campt, sound can be listened to and be felt, it touches and moves people, and sound must therefore be theorised and understood as a profoundly haptic form of sensory contact (Campt 6). While my research does not focus on sound or utilise it within the creation, VR is an inherently embodied experience and therefore this is a powerful device for engaging with the work. By placing the audience directly within the piece, this grants viewer multisensory access to the piece, allowing them to 'listen' into the subject matter in a deep and compelling way.

Campt's proposed framework invites us to challenge our understanding on how we perceive sound, along with reimagining how we perceive information through our senses. Deep mapping itself echoes this sentiment by subverting how we perceive information through conventional two-dimensional mapping, adding further depth that places an emphasis on sensory expression, which I have developed in my research creation project through 3D and game engine design and development to build my VR. Campt invites us to investigate the stories of the banal and mundane everyday things with her practice. While applying this to my own making practices, I felt this the most vividly during the furniture 3D modelling process. By listening to images, I found myself listening to the everyday objects in both spaces. I would listen intently to the reference images provided to me by my relatives in China, trying my best to recreate their essence as I modelled them. I would listen to the photographs within my grandmother's home, including the family group portraits dating all the way back to my mother's childhood (see fig. 20-21). I would listen to images from my own illustration practice along with the images, trying to analyse how my style inherently expresses a part of myself. I would also try to listen to the images from my grandmother's own traditional Chinese painting practice, finding a connection between her creative practices and how they related to my own.

As I fashioned each furniture piece within Blender, I felt a connection with each and everyone of these objects, especially since the furniture in my grandmother's house has not changed for decades. Several furniture pieces in my bedroom have also stayed within our household since my childhood, carrying the history of our family within their presence. Modelling the miniscule details of feet, legs, and details of cabinet furniture would trigger specific memories and moments of lived experiences in my life, making me realise the power of banal things (see fig. 16). While recreating these memories, I noticed the subtle stylistic differences in architecture which reflect the culture, the differences in lifestyle from the sizes of the rooms, and how spacious my living quarters in Toronto were

in comparison to Shanghai (see fig. 17-19). Usually, I would not be as keenly aware of these differences without investigating them in such detail.

Throughout my life, I have only been able to revisit Shanghai a handful of times. Modelling out each of these rooms from reference photographs and my own personal memories enabled me to imagine I was physically there. For Campt, listening to images means to listen for stories in less likely places, locating it in everyday imaging practices of communities past, present, and future (Campt 17). According to Campt, *'Listening attentively to these mundane details means not accepting what we see as the truth of the image. Attending to their lower frequencies means being attuned to the connections between what we see and how it resonates. A polyphony of quietly audible questions reverberates in these lower frequencies and resonates in tandem with the images'* (Campt 33).

Creating these 3D objects and environments made me feel connected to these places, envisioning the moments of daily life that have occurred in Shanghai without my presence. Despite the distances between myself and my extended family, in both culture and language, I felt these gaps start to close as I tried my best to tune in and listen to the



08.28.21 - More reference photos of exterior

Figure 13 An excerpt from my Google Slides documentation, reference photos 1.



09.08.21 - Reference photos of interior

Figure 14 An excerpt from my Google Slides documentation, reference photos 2.



09.08.21 - Reference photos of interior

Figure 15 An excerpt from my Google Slides documentation, reference photos 3.



Figure 16 Material preview view of Toronto living space 2.

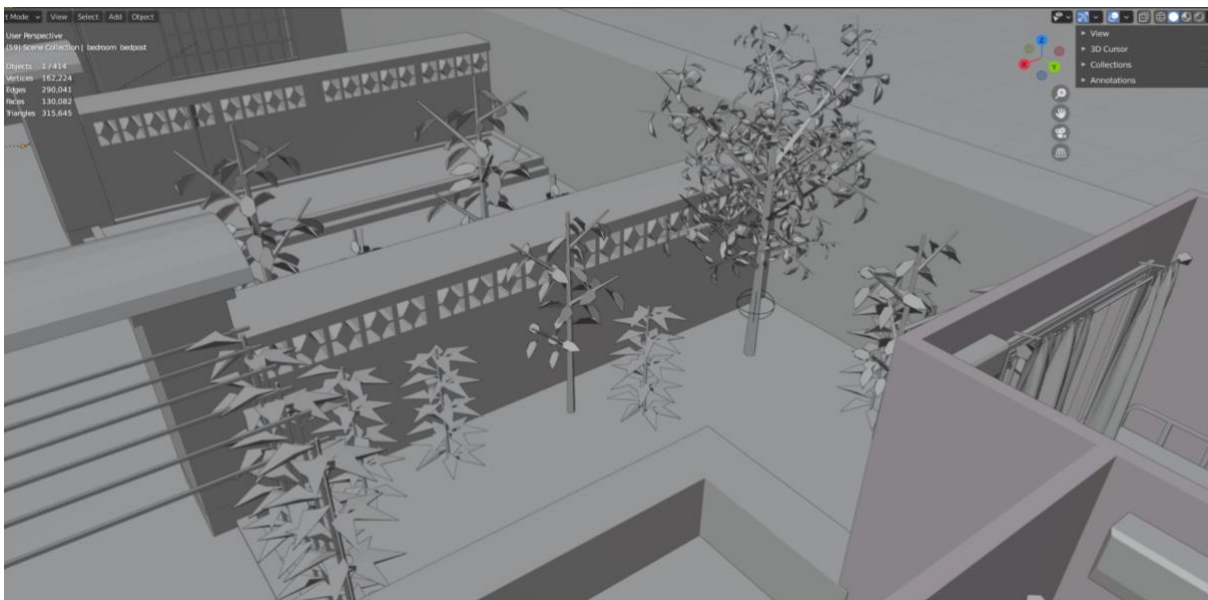


Figure 17 Material preview view of my grandmother's front yard.

narratives of everyday objects. The main living room by the front door with a television set is where we would often gather and watch the daily news, drama shows, or singing performances while eating snacks. The snacks we would consume are quite typical of what most Chinese people enjoy including clementines, watermelon seeds, and sweet

black sesame bars. Modelling out the small kitchen and dining area brought back memories of communal moments of having family meals together. The food my eldest aunt would prepare were often several dishes at once, including leftovers from the previous day.

Campt's fascination with passport identification photos comes from the fact that they are so easily overlooked, and that they are often the least celebrated and often most disposable archives of photography, calling it an alternative visual archive and quiet photography of the African Diaspora (Campt 17-18). Within my grandmother's house, there are old photographs that document the lives of my family members framed on the walls. In the main living room of the space, there are old film photographs of my mother's family when she was younger, with her parents and sisters. My mother is the second oldest daughter in a family of four daughters. This was before China's one-child policy was enacted and having multiple children was still allowed. In my grandmother's personal room there are more framed photographs of my grandmother with her husband, along with another portrait of her with my cousin when he was younger. Viewing these photographs through the lens of 'listening' to these images and hearing the personal stories of my mother's side of the family, I can hear a narrative that speaks clearly about a family that has endured a lot of hardship. Every time I return to my grandmother's house, viewing these photographs as I grow older, my emotional responses to these images continuously evolve (see fig. 20-21). I often ask myself the questions of how can I relate to my family members where I have spent a significant portion of my life seldomly interacting with? Despite sharing familial ties, there is a huge divide between myself and my extended family, regretfully where I haven't been able to devote as much time as I would like. Having a language barrier and being unable to communicate freely between, I feel simultaneously a feeling of deep connection to my family members, feeling their resemblance, however I also feel the separation. Yet I am still able to sense the familiarity between myself and their stories, based on universal experiences, shared across all families and their children from all different backgrounds.

While trying to listen to these images, I find myself drawing connections between myself and my family members. I try to envision what my family members must have gone through during their childhood and youth. Despite their blank expressions in their photographs, seeing my mother and her siblings at such a young age, listening to their photos gave them a more and humanising quality where I took on an interest in envisioning their stories. My initial reactions were discovering a personal unspoken connection to my distant family members and a willingness to reach out to their stories,

sensing these generational patterns amongst us. It also made me realise that there is so little that I know about my family members' personal lives other than the few anecdotes I've heard about them throughout my life. I had known the history of my grandmother serving as a nurse during the Japanese invasion of China, however outside of those narratives, my grandmother's life in detail remains mostly unknown to me. Likewise, I believe there is probably very little my family members in Shanghai know about my own personal life as well. However, I believe that listening to images presents another way of engaging with two dimensional images similarly to virtual reality on a sensory level. Listening to images encourages the viewer to engage with the material beyond absorbing the content on the surface. Rather than viewing these portraits at face value, listening to images encourages the viewer to deepen their understanding of the subject matter, envisioning their lives and seeking out the emotions within them. With the positionality of placing the viewer directly within the piece, virtual reality adds further dimensionality to the artwork, allowing it to become more alive and immersive. Through this immersive quality, I have discovered it to be an effective tool for gathering memories about my family's history, through listening to my parents recount their lived experiences while reacting in VR as well.

Throughout this process, I not only found myself listening to images not only from family photographs and references, but also tuning into the two-dimensional images from my own illustration art practice. With the diasporic identity, there is often a constant struggle within one's cultural identity and finding their place within a country that is not considered to be their motherland. In Su Zheng's text, '*Claiming Diaspora*,' she poses the question of how we should think about contemporary Asian American cultural identity, Chinese American cultural identity, and the relationship between the two (Zheng 7). Considering America's increasingly diversified population and extensive geographical and cultural boundary transgressions, and how is the Asian American identity evolving as a whole, under the growing presence of recent Chinese immigrants? Can they claim an influence on the American consciousness? (Zheng 7). With these questions in mind, I often wonder how my experiences as a Chinese diaspora can contribute to this ongoing discourse of what constitutes as the Asian American identity.

Whilst establishing my own art practice in North America, I have often debated how much of my own cultural identity to show within my art, and whether it would be accepted or palatable to Western audiences and clients. Throughout the years, I have constantly struggled to find my own artistic identity along with making decisions on how to best represent myself. From a young age, I was inspired heavily by Chinese aesthetics, their

intricate detail, and variety shown in their paintings, sculptures, architecture, calligraphy and traditional motifs and symbolism within their folklore. Chinese culture has a rich history that spans over 5000 years, full of philosophy and fascinating ideologies. I have always been attracted to my own culture's diversity, longing to incorporate elements of it within my own design. There have been times where I have made my art look more explicitly 'Chinese', but later felt that it needed to be modified to better suit sensibilities of Western culture. Currently my own style is loosely based off Chinese paper cut art, intricate pieces of paper with bright colour and flat shapes (see fig. 22-23). From listening to the images from my own practice, I can sense it being an amalgam of many things and influences. For the most part, I often see my style as an interpretation of Chinese culture



Figure 18 Family portrait of my grandmother's family.



Figure 19 Photo of my grandmother and grandfather in their youth.

in my life, subconsciously influencing my hand in the design decisions I make. Like myself, it is a negotiation and culmination of lived experiences that encompasses experiences of being raised in the West through Chinese heritage.

My grandmother, like myself, is also an artist who practices traditional Chinese water ink paintings, albeit more as a hobbyist rather than as a professional (see fig. 24). My mother's side of the family has always been artistic, including my oldest aunt, my mother, and my youngest aunt all enjoy painting as a hobby in their spare time. Seeing the artwork they've made throughout my life has had a profound impact on my own art practices. It influenced me to take an interest in becoming an illustrator as well. Her style is based on the '*shan shui*', literally 'mountain water', style of Chinese painting, which is rooted in unique ideologies. In terms of style, medium, subject matter and colour palette, this style is very different from mine. The Shan Shui style of painting is not based on representing nature exactly as how it's seen in real life, but rather to capture its essence and the artist's own interpretation of how they view nature to be. Shan Shui painters often do not strive to reproduce realistic scenery as much as to capture on paper an awareness of inner reality and wholeness by means of the quality of their brushwork, as though the

painting was flowing directly from the artist's mind, through the brush, onto the paper (Shan Shui).

Through listening to my grandmother's art making practice, I tried to envision what her thought processes could have been. Being her modest self, she would always tell me it was completely done as a hobby and nowhere near my level as a professional working artist. However, I hold my grandmother's paintings with a lot of respect and awe of her talent and passion. Perhaps they had an amateurish quality in comparison to the higher standards of professional shan shui artists in China, but I personally felt a significant connection to these pieces, trying to envision what must have gone through her mind as she made them. Therefore, I felt it was important for my grandmother's paintings along with her photographs to be included within the virtual reality creation. I wanted my viewers to also experience these significant images inside the VR piece, placing them within the space in their respective locations to real life. My hope is for these images to allow these spaces to feel more personal, adding a further method of interaction for the viewer to engage with the space and empathise with the residents who lived there.



Figure 20 A Chinese papercut art piece.



Figure 21 Samples of my illustrations with Chinese art influences.



Figure 22 My grandmother's 'Shan Shui' paintings.

BODY OF WORK

EXPANDING UPON 2D IMAGE-MAKING INTO 3D AND 4D

My thesis project was the first time I have attempted creating a virtual reality experience. This was a new process for me that involved learning how to work through the 3D workflow pipeline and picking up steps of the game making process. I found that my learning process of creating virtual reality became an auto-ethnographic practice in and of itself, via deep mapping and recording my memories using 3D making tools. Through deep mapping, places are unpacked in terms of the modern subject's spatial and political unconscious as well as layers of memories (Bodenhamer et al 103). VR making processes allowed me to map out and engage with my identity in a modular way through several stages, with each stage revealing something new about myself each step

of the way.

Virtual reality creation is a very iterative design process. To expand upon my 2D illustration practice, I wanted to use game engines and 3D modelling as a way to explore new modes of expression and develop myself as a creative. This gave me a context to generate research into my past and present and accumulate insights from various perspectives. Breaking down the process into key stages gave me a practical approach toward accomplishing this very ambitious task. My creation process was broken down into the following stages: experimentation, greyboxing, 3D-modelling, texturing, lighting, adding audio and other interactions, and finally exporting to Unity and then to the Oculus Quest Headset. At every stage, there were always intriguing observations to be made, while simultaneously piecing together the skills and knowledge needed to work within a 3D creation workflow. As the virtual reality piece continued to evolve, expanding upon the previous iteration, new knowledge was continuously being introduced at each stage as my art practice continued to progress.

EXPERIMENTATION & IDEATION

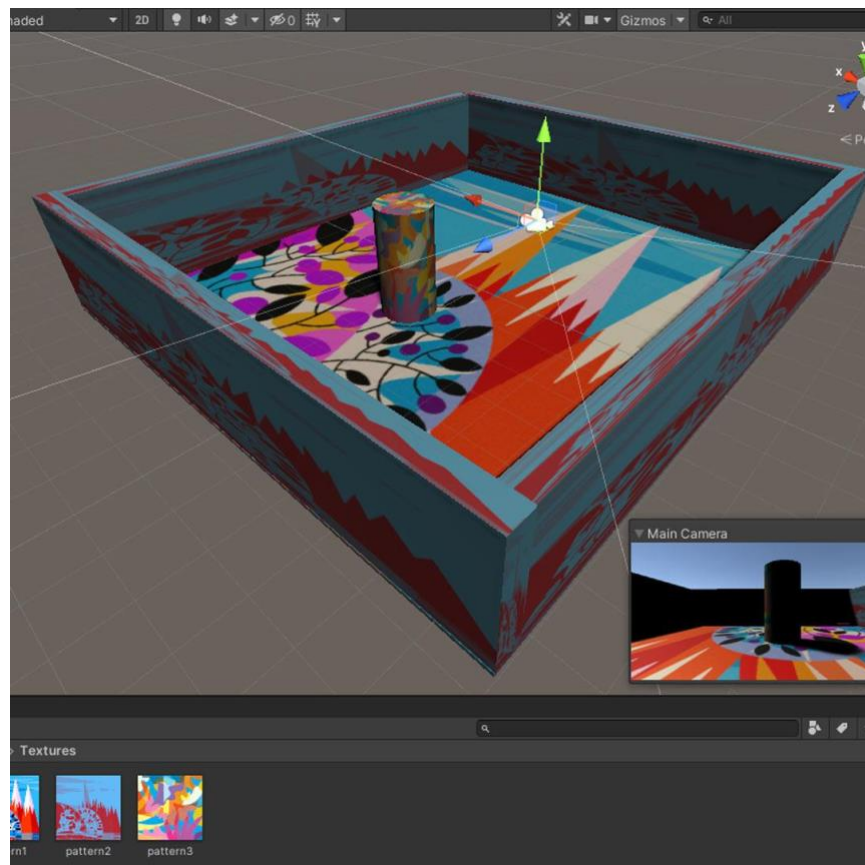


Figure 23 Experimenting with textures inside of Unity.

At the very early stages of this thesis, I went through various preliminary experiments and ideation phases to grasp a hold of the concept for this piece. While working through these initial stages, I tried out various 3D modelling software, ranging from modelling applications directly on a VR headset to traditional desktop-based programs. Eventually I decided to use the free open-source program Blender as my main 3D making tool of choice. While refamiliarizing myself with the software's mechanics and interface, I began 3D modelling various plants around my home, starting from referencing objects from real life as a way of honing my skills. (See fig. 26) Through these experiments, I came to the decision very early on that I wanted to record and document my lived memories within the context of spatialized narratives. Within the last two years of this pandemic of seldom leaving to go outdoors, my Toronto home has become a very intimate space for me. For diaspora, the concept of where culture is located and place bound identity is often one that is contemplated and questioned throughout their lives. To contest and challenge this notion of place bound identity, I wanted to create a new space that could converge the two formative spaces that have shaped my identity the most throughout the course of my life. The houses we live in are more than just merely buildings used for housing and shelter purposes. They become our livelihood and embodiments of our identity and memories. There are deep connections that are formed between the places we reside in and how they represent ourselves.

During my ideation process, one of the major influences of this project was from a short video game piece called 'P.T', short for 'playable trailer' created by Hideo Kojima in partnership with Guillermo del Toro as part of the Silent Hills franchise. The game creation itself features the player walking through a looping hallway haunted by a terrifying ghost through the lens of a first-person perspective. The narrative is communicated through the atmosphere, the lighting, and the objects around the household, progressively revealing new details and information with every consecutive loop. I was fascinated by the way a narrative was constructed without the presence of other human characters, except for the spectre that serves as the antagonist. I wanted to borrow elements from how inanimate objects can carry significance and meaning with them as well, tied together with memories they symbolise.

I also wanted to familiarise myself with using game engine software, as I knew this was an important decision that had to be made when approaching the virtual reality development process. When choosing which gaming engine to build the virtual reality experience in, I needed to find an application that would allow me to comfortably incorporate all the elements of the deep map I was seeking to create, creating a container

for memories, an area to contextualise experiences. I had also debated the possibility of using a web-based VR platform such as A-Frame as a possible route for this thesis. However, after considering my needs, I decided to choose Unity as my main game engine because its interface is straightforward and easy to use for beginners to 3D, along with having a wide range of free tutorials online making it very accessible to learn and troubleshoot.

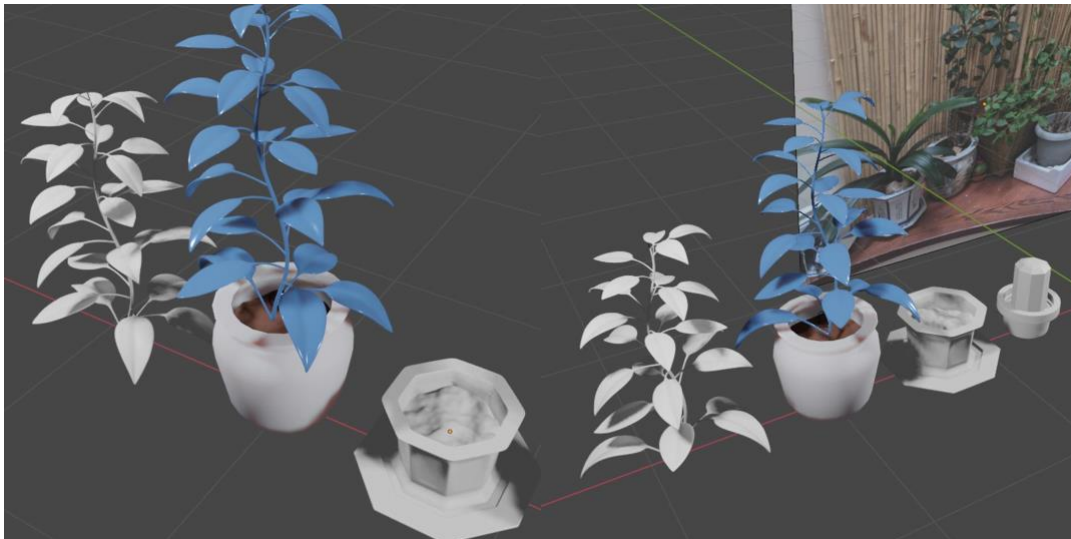


Figure 24 3D-Modelling experiments in Blender with houseplants.

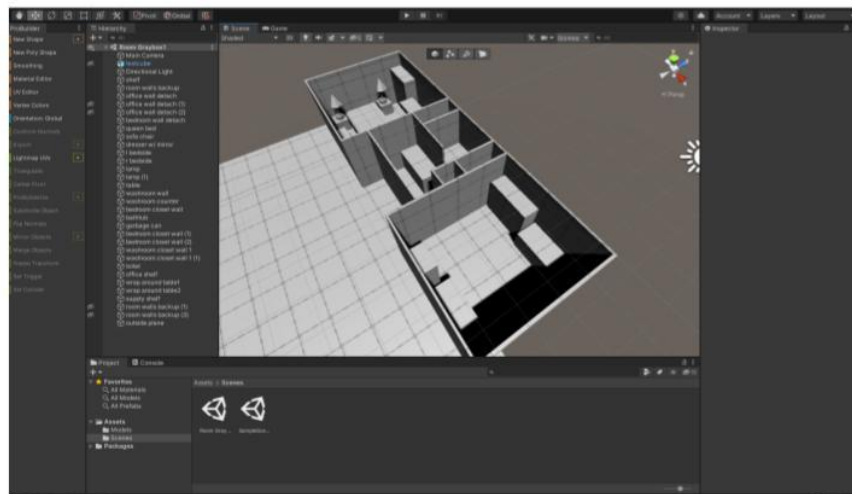
To pick up the basics of the software, I began experimenting with basic 3D shapes and applying pre-existing illustration textures to them (see fig. 25). I found that it was relatively easy to import and compile together a variety of different elements in a modular way. Deep maps are meant to be achieved using a variety of media, not as an aesthetic gesture, but as a practical necessity (ibid et al 39). With the aid of a game engine, world building, and environmental design became a very achievable task. Going from simply conventionally mapping or documenting my lived experiences, virtual reality can enhance visualisation through an emphasis on sound, smell, and touch; transforming yesterday's two-dimensional maps and simulated virtual representations into today's real virtual environments that are simultaneously multidimensional, multivalent, and sensory (ibid et al 103).

GREYBOXING & EARLY PLAYTESTING

After selecting the proper tools and references required for building out the world, I learned of a concept within video game design known as 'greyboxing' — creating a rough prototype of the environment directly within the game engine, essentially a sketch

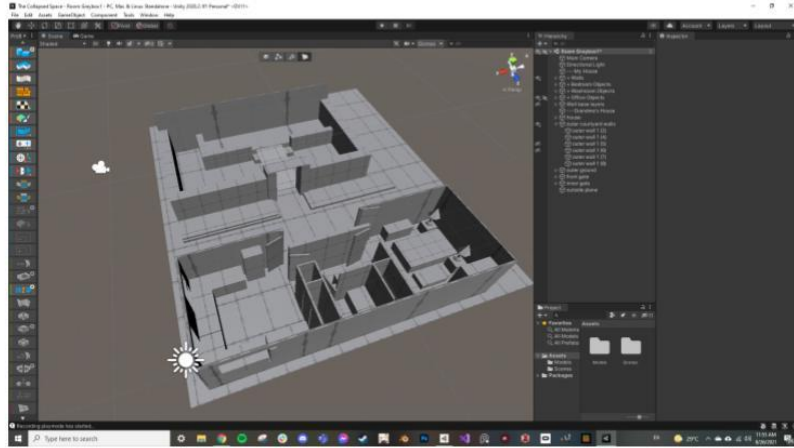
of what the design layout will look like that is ready to be play tested at any moment. Greyboxing allows for the level to be mapped out right away, making the development progress more efficient and helping to determine the scale of each object more easily. The tool I used for this was a Unity plugin called ProBuilder.

During this stage, I used a variety of source materials and photographs gathered by my aunt's husband still currently living in my grandmother's house to reference from. Gathering these resources was an emotional process for me, making me feel as though I had travelled back to Shanghai once more. Bodenhammer describes two different types of movement within virtual environments when used in the context of deep mapping purposes. Virtual environments present an open and experiential space that allows users to be immersed within a world in which uncertainty, ambiguity, and contingency are ever present but all are capable of being braided into a narrative that reveals the ways in which space and time influences and is influenced by social interaction (ibid et al 20). Within this space, it is possible for both horizontal and vertical movement, with horizontal providing linear progression associated with rational argument and vertical movement providing depth, texture, tension, and resonance of experience (ibid et al 22).



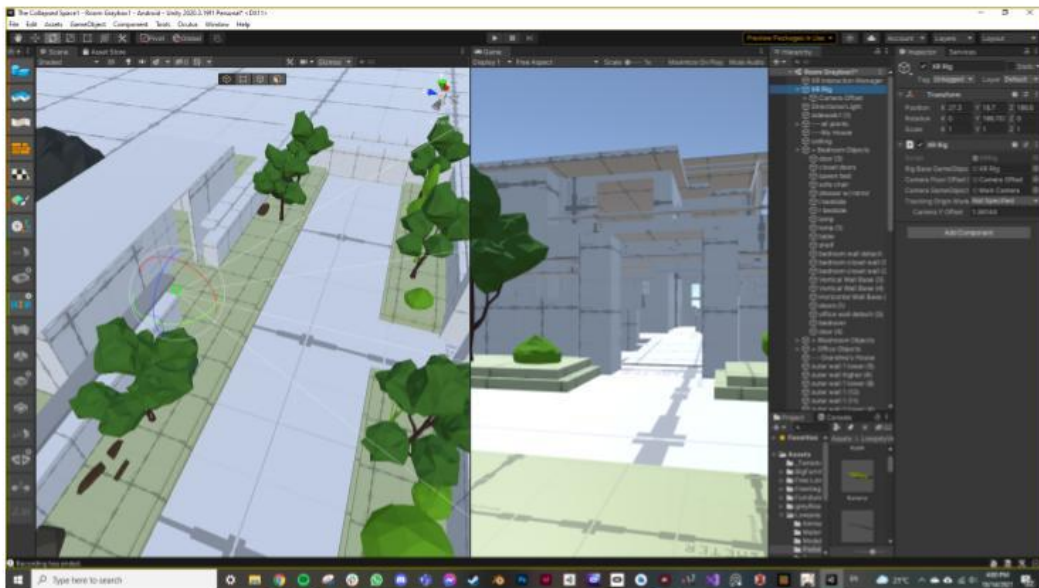
06.26.21: Greyboxing my first level, the 3 rooms in my house using ProBuilder

Figure 25 Greyboxing the prototype 1.



08.26.21: Adding to the level, Grandmother's house

Figure 26 Greyboxing the prototype 2.



10.14.21: Revising level using 'Game' view to help

Figure 27 Greyboxing the prototype 3.

To establish the horizontal movement in this space, creating the ProBuilder was an effective tool in mapping out the skeletal structure of the environment, setting up a contained space that could merge both Toronto and Shanghai. It took several iterations

to fully realise the final layouts, while also figuring out the logistics of exporting the preliminary build to the Oculus Quest 2 headset. The architectural structure of both the Toronto and Shanghai spaces were maintained according to their exact layouts in real life within my 3D re-creation process. The preservation of these layouts creates the pathways for linear progression throughout the virtual experience, depicting a more or less accurate portrayal of what it is like to walk through either of these residences. Maintaining this close semblance and authenticity allowed me to feel a strong connection to these spaces in real life. Recreating my grandmother's house virtually also felt like an act of preserving the living space as a testament to her life within living memory. My grandmother's house is already quite old and with many parts of the exterior starting to deteriorate. Therefore, this virtual reality piece was also a great way of preserving her life and maintaining posterity.

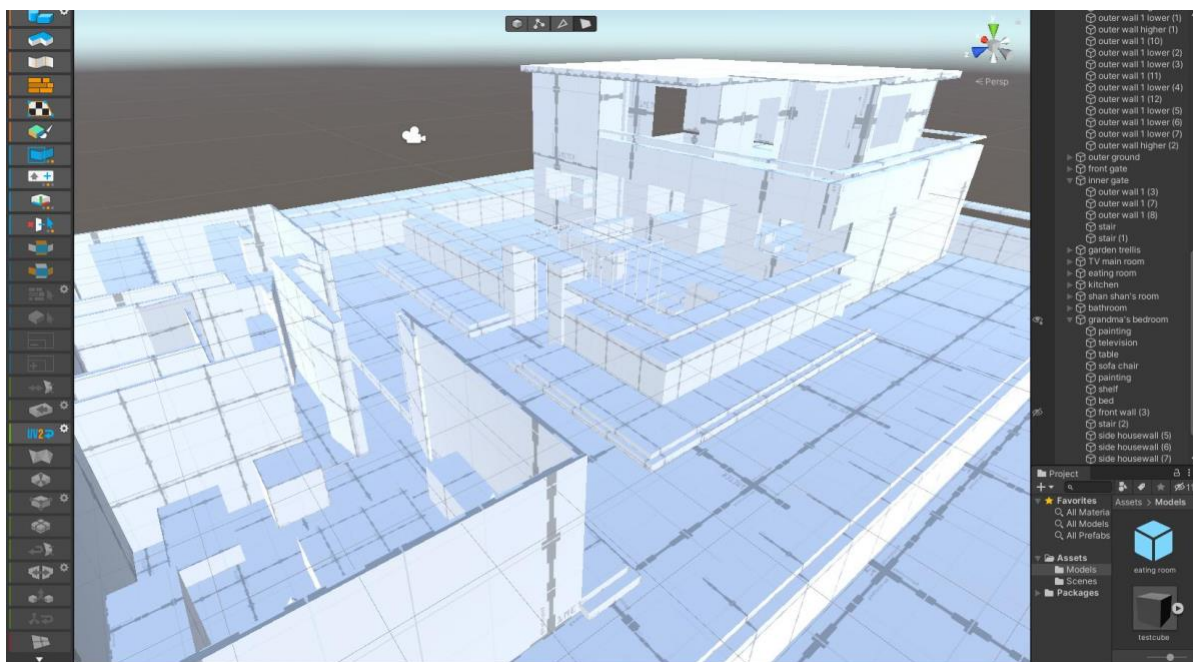


Figure 28 Greyboxing the prototype level within Unity.

Playtesting the environment for the first time evoked an emotional response for me. While designing the prototype, getting the height and scale of the walls and furniture took several attempts. At first, the ceilings and walls towered way too high above my height in virtual reality, making the space feel enormous or gigantic. Even though it was a low fidelity rendering of the original, it already enabled me to feel a range of emotions and recall specific memories within my mind. Placing me directly within the piece was a compelling way for me to experience the space even through the preliminary stages and

getting a sense of how the environment was expressed within a 3D format.

Using a game engine, combining two vastly different worlds and storied lives became a very achievable process. To create a holistic approach that could easily merge these two geographically separated regions into one seamless environment, the exterior of the Toronto space was made to look like part of the small neighbourhood street just outside of my grandmother's house in Shanghai. Collapsing these two locations was done with the intention of expressing multiple perspectives and narratives within a singular encapsulating entity. As the viewer engages with this deliberate creative intervention of collapsing these contrasting environments, multitudes and layers of experiences are compressed together, resulting in a rich and engaging experience. After coming to a satisfactory iteration of my greyboxed level, I decided to move on to modelling each of the assets within Blender.

3D-MODELLING

Weakening the representational function of space is always encouraged within deep mapping. Cartographic representations in stasis are dangerous in the way that as framings, static maps work to foreclose the possibility of alternate interpretations through an emphatic rendering of 'naturalness' or 'inevitability' (Bodenhamer et al 108). Virtual reality as a medium, allows me to weaken objectivity and break up these feelings of environments kept within stasis. During the 3D-modelling process of creating '*The Collapsed Space*', I found myself constantly making decisions between whether to adhere to a completely realistic portrayal of the two spaces, or to allow myself the freedom to move away from accuracy. These would range from decisions about representing objects as simple and mundane as the feet of cabinets, the accuracy of doorknobs, and the inclusion or exclusion of certain items. Every asset within the research-creation was modelled by myself, instead of choosing to use premade assets made by others.

In real life, the arrangement of the furniture layout has not changed for decades in both the Toronto and Shanghai space. As years go by, it is interesting to note how time feels as though it has stood still and that moments are preserved within a static state. In everyday households, rearranging furnishings, and major alterations to the interior design of spaces are seldom occasions that occur. It is often quite an ordeal to move furniture around and the spaces that we inhabit often don't drastically change unless we move into a new space. Throughout the times in my life, when I return to visit my grandmother's

residence in Shanghai, I feel as though little has changed on the surface and the furniture arrangement has always remained the same. Each room and living space were kept preserved in such a way that signifies that the daily lifestyles within these dwellings have kept to a similar routine for numerous years. Within the virtual space, the placement of each furniture piece establishes the foundations and objectivity of the setting, creating the areas for horizontal movement.

I was still new to the 3D modelling process and therefore kept the rendering process simple. To stay cognizant of this medium, I attempted to keep the vertices count to an amount of below 100000 vertices, which is the optimal amount for virtual reality creation based on the processing power of the Oculus Quest 2. Having this limitation helped guide me through the process of knowing what level of fidelity to keep it at. With a limitation set, this gave a lower graphic quality to the entire piece rather than a highly realistically rendered one. Personally, I enjoyed having this limit set in place which influenced the aesthetic style of the entire research creation. Due to the amount of time that was available and the amount of work that needed to be completed by one person, it was important to stay cognizant of what was possible.



Figure 29 Material preview the modelled level.



Figure 30 3D Modelled view of my grandmother's house from the front.

TEXTURING

To implement other moments of vertical movement to the space, I experimented the most during the texturing phase of the 3D asset creation workflow. There were certain elements where I chose to preserve the objectivity of the space by using realistic open-source image textures from the internet for hard surfaces such as wood, concrete, metal, ceramic, and plaster. These realistic textures contributed to the horizontal mood of the space, establishing a feeling of with an emphasis on flat shapes and geometric forms. Experimenting with negotiating the divide between *'realistic'* and *'stylized'* representation is something I constantly reckon with throughout my artistic practice. My bedroom on the Toronto side of the virtual reality map was a central area for vertical expression and expressing my personal identity. Throughout my own Toronto living space, I had the liberty to include illustration textiles in any way, exaggerating the space from how it is seen in real life. I wanted the space to feel uniquely as my own in this way, using illustrations that depicted my personality and a feeling of my own personal presence within the scene.

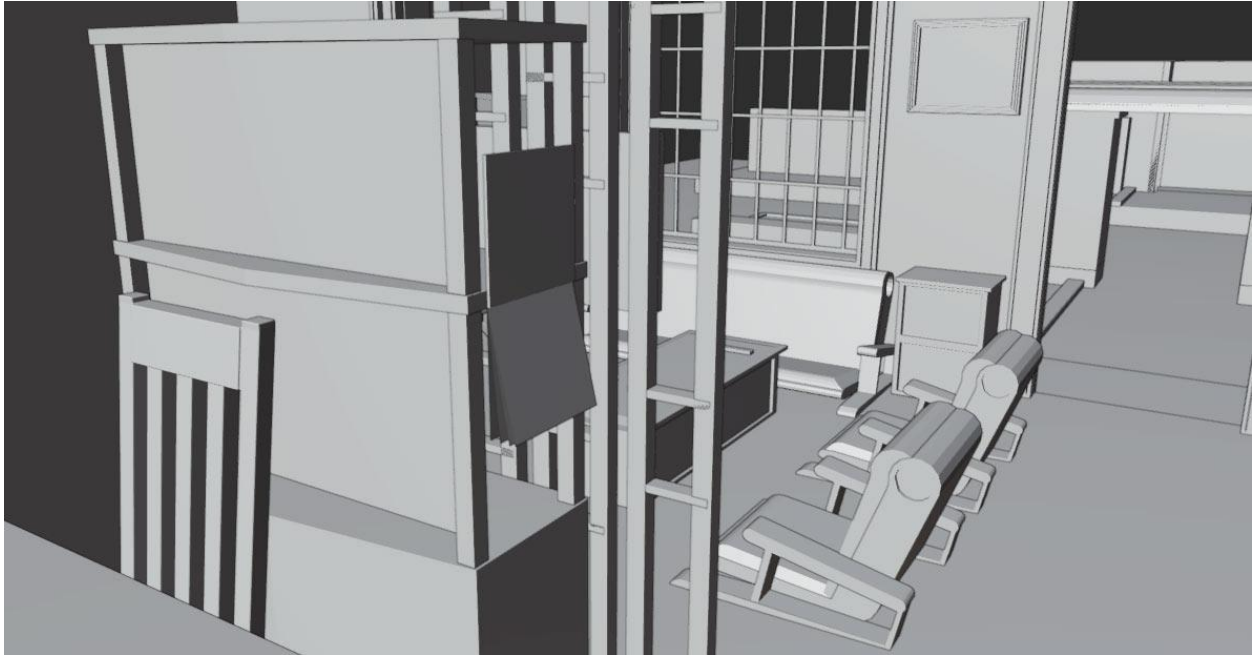


Figure 31 3D-Modelled view of my grandmother's house, TV room 1.



Figure 32 3D-Modelled view of my grandmother's house, TV room 2.



Figure 33 Samples of open-source wood textures used to texture the models 1.



Figure 34 Samples of open-source wood textures used to texture the models 2.



Figure 35 Samples of textures for cloth assets made from my illustrations 1.



Figure 36 Samples of textures for cloth assets made from my illustrations 2.



Figure 37 Aerial view of my grandmother's space with texture preview.

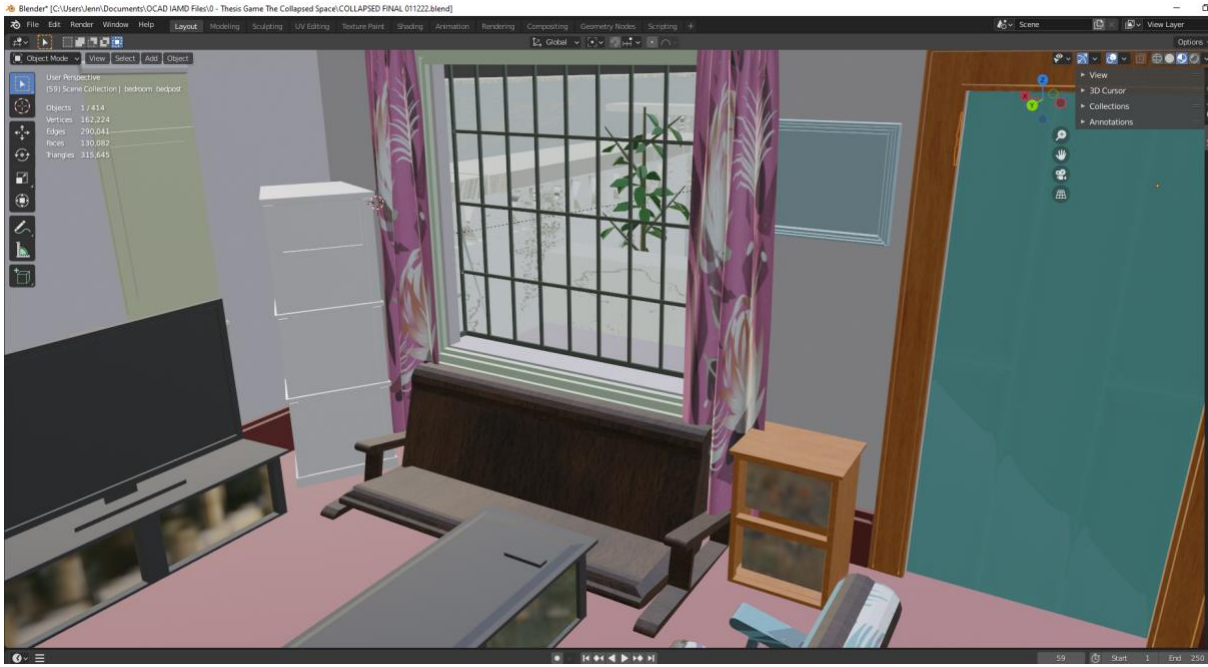


Figure 38 Final version of my illustrations being used as curtains in the TV room.

LIGHTING & BAKING, AUDIO & SOUND EFFECTS

At this current point in time, due to how ambitious this project is for one person, there are still several stages that need to be developed. Outside of the 3D-modelling and implementing personal illustrated textures, lighting within virtual environments also can add dimension and further immersion within the piece. Baking textures and lighting is a method within 3D-creation that allows for precalculated lighting and texture data to be stored within a map and imported into the game engine. This reduces loading times and allows for the virtual reality application to run more smoothly and efficiently. Within the future, I would like to continue adding to this research creation and experiment with the lighting in a creative way to add depth to the piece. I would like to use lighting in a way that adds to the emotion and mood in a compelling and subtle way. Outside of conventional ways lighting is understood, I would like to experiment with the expression of light, perhaps being selective with where lighting is used or creating lighting effects that emphasise certain aspects of the piece in a poetic way.

With the inclusion of audio, there is also the possibility of adding depth to the atmosphere using subtle sound effects and recorded audio. Overall, my intentions of this research creation are to limit the amount of audio used, using it more as ambient noise rather than include a music track in the background. Originally, I also considered including recorded audio clips and having them activate when certain parts of the map are activated. However, I also realised that a 'silent' environment also had a profound effect on my family members as they walked it within virtual reality. This made it more effective for extracting their thoughts and reactions to the piece, because they weren't being prompted by any other cues and were simply responding to the creation with their own interpretation and thoughts. Therefore, if I were to maintain this as a tool for gathering further research on my personal family narratives, the conscious choice of using minimal sound within the piece might be an option worth considering.

VIRTUAL REALITY EXPERIENCE

The following screenshots are from the playable build I created for the Oculus Quest 2 headset. These are images are taken directly the viewport view of Blender and from within the view of the Quest 2 headset. This playable build allows the viewer to walk through the level within the headset, exploring through it from a first-person perspective, using the headset's controllers to move through the environment on continuous mode. The player may venture through to any area they please and explore any part freely.

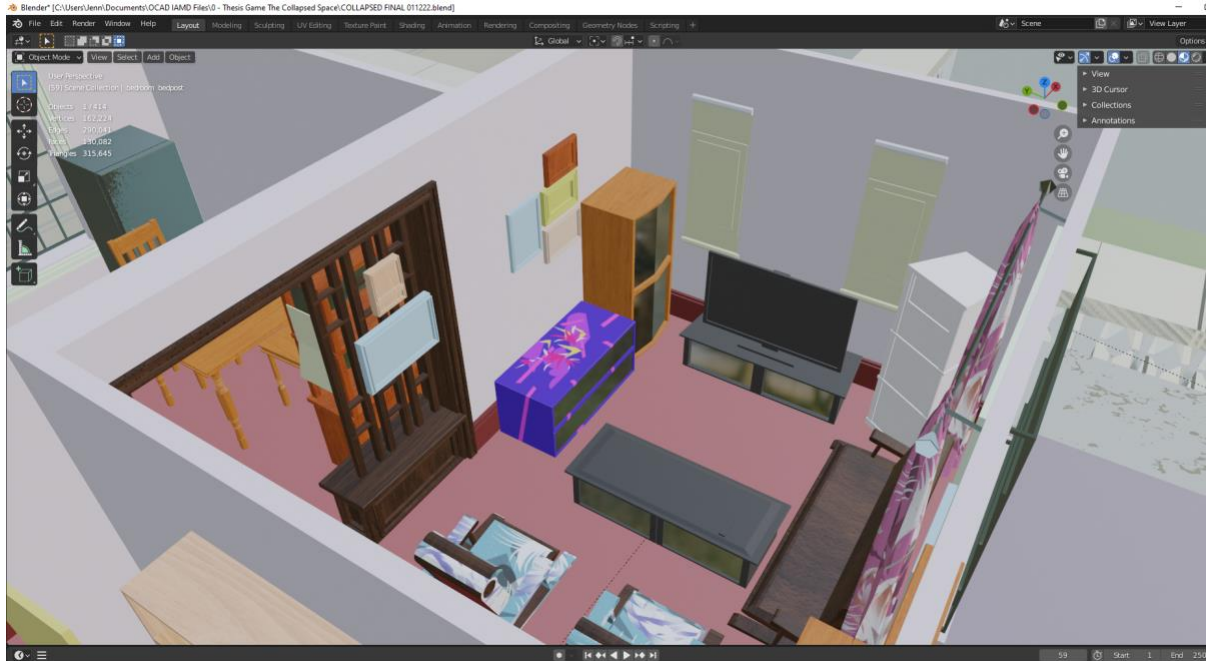


Figure 39 Grandmother's house, TV room.

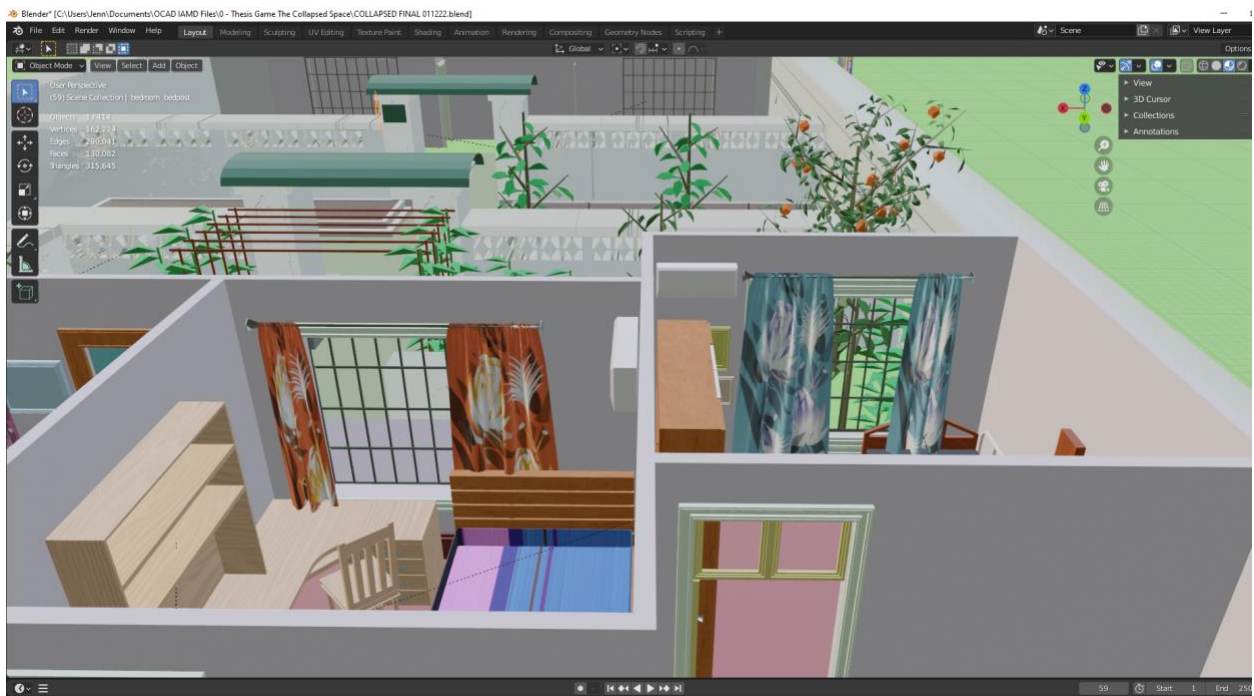


Figure 40 Grandmother's house, cousin, and grandmother's room.

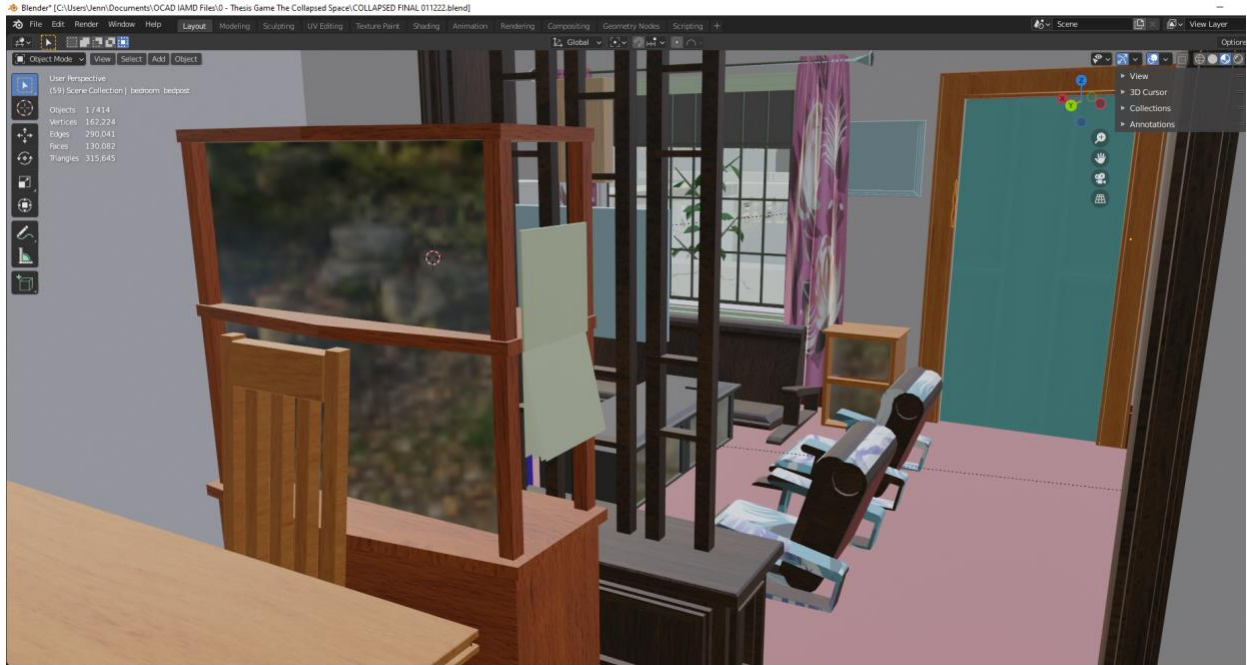


Figure 41 Grandmother's house, view from dining room facing TV room.

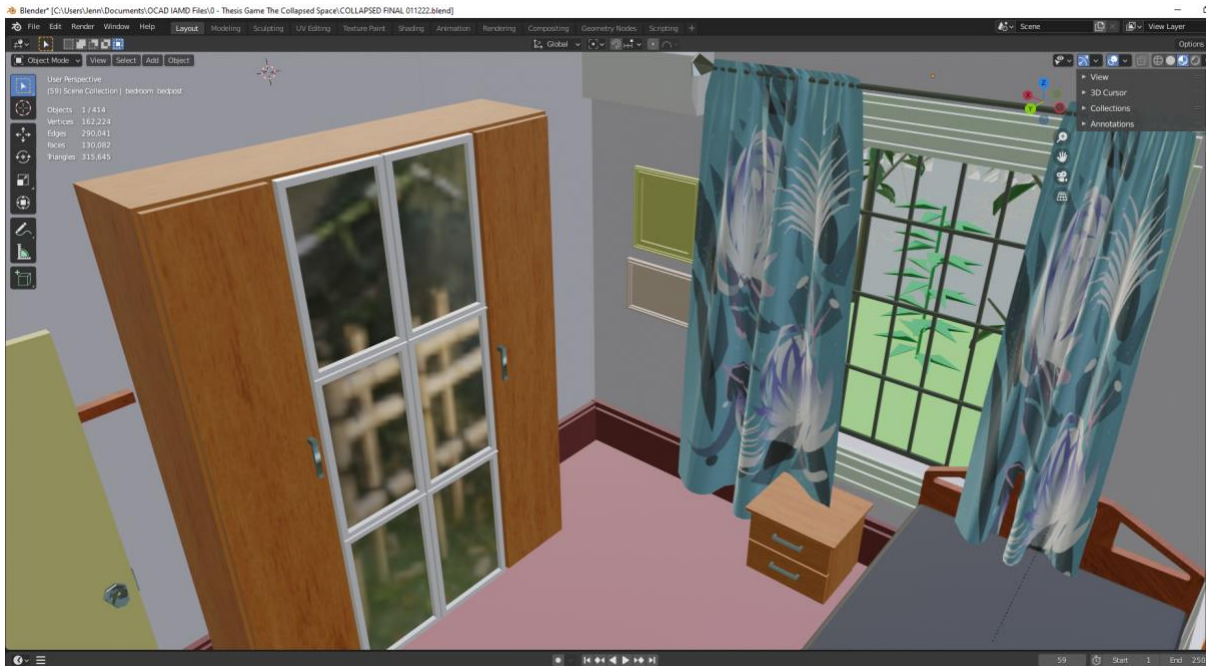


Figure 42 Grandmother's house, my grandmother's room.

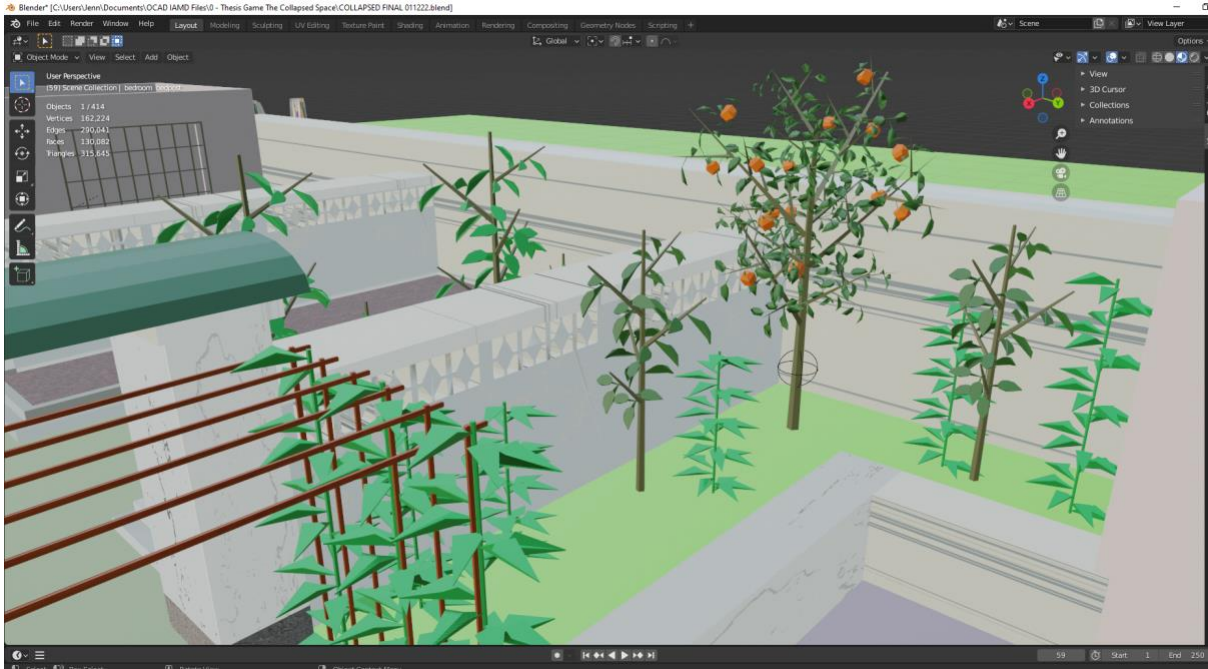


Figure 43 Grandmother's house, front yard garden.

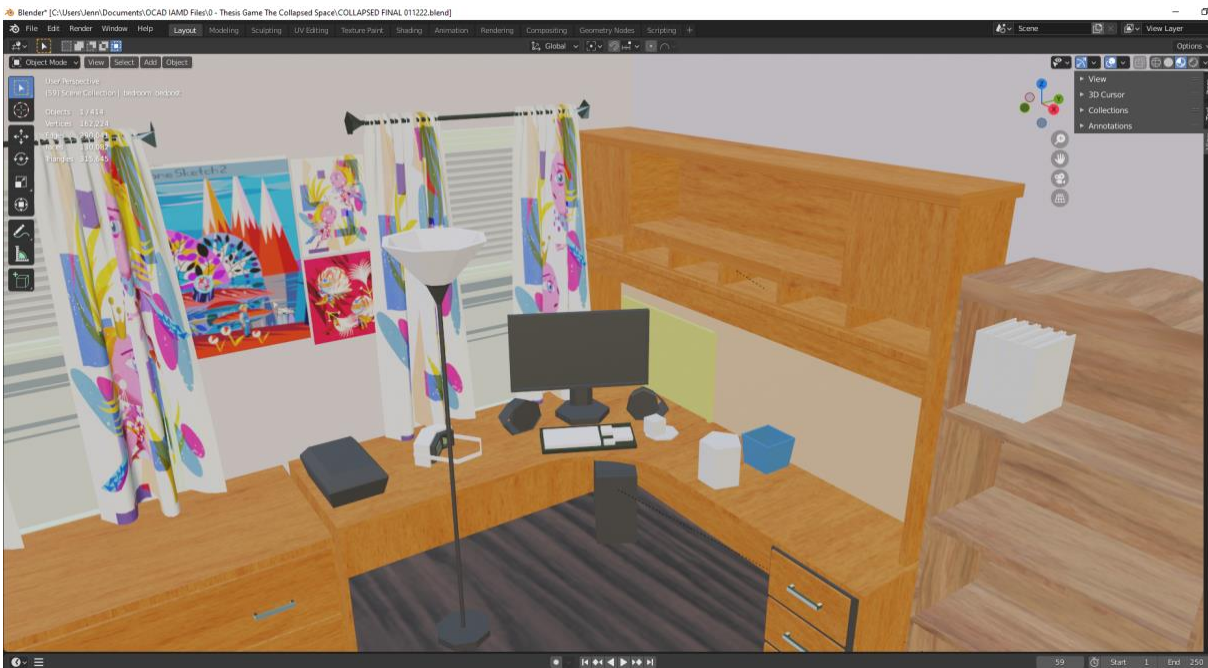


Figure 44 Toronto living space, my office.

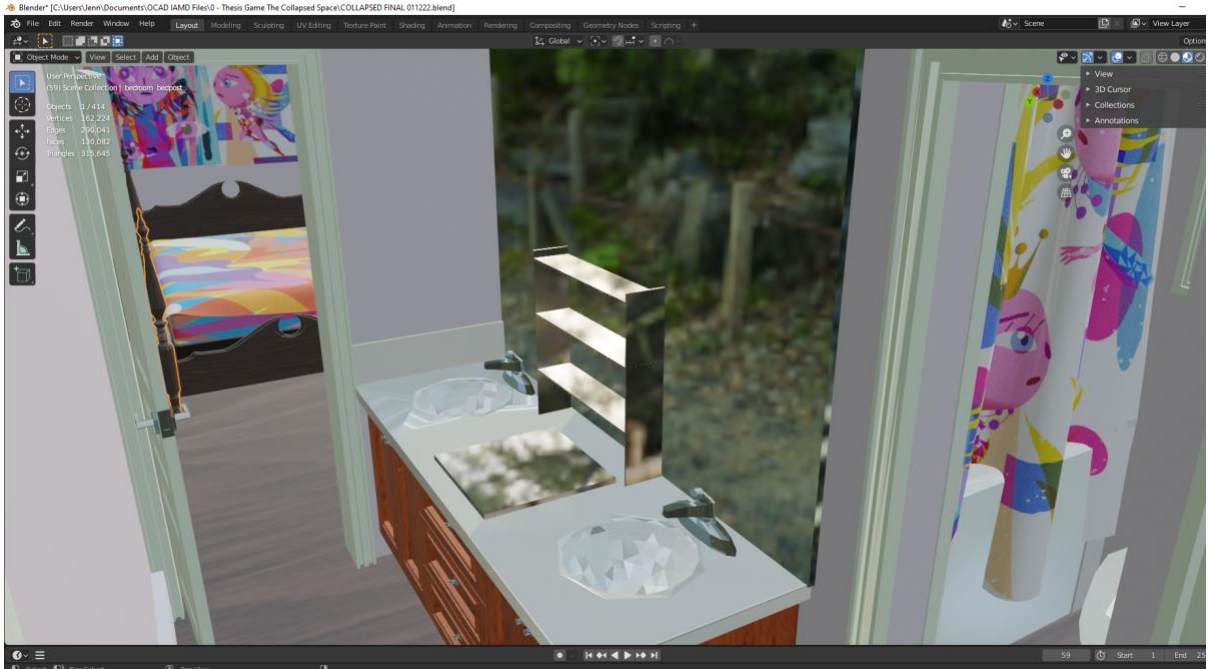


Figure 45 Toronto living space, my washroom.

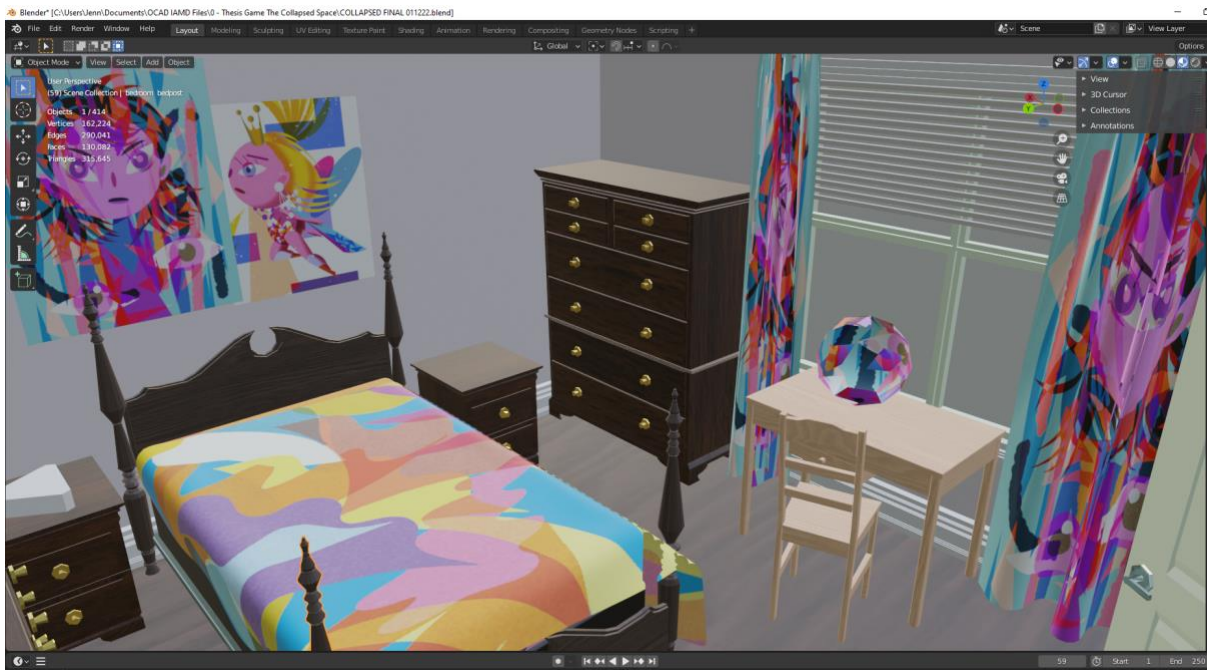


Figure 46 Toronto living space, my bedroom.

INTENDED OUTPUTS & AUDIENCE

With the creation of 'The Collapsed Space', this virtual reality creation has become a place of its own, imbued with memories from not only my past but also from my parents' generations as well. Outside of creating this piece for gathering research from myself and my family, the following are other possible formats for widespread output and gathering a wider audience that I would like to explore.

ONLINE DISTRIBUTION

One format for public and open distribution of this virtual reality piece would be to upload the creation's files onto a platform known as itch.io. Itch.io is a website that allows its users to upload, host, sell, and download indie games. My intentions would be to use it as an easy way to share files amongst my family members and friends, to gather their feedback on the piece. This format will be a downloadable experience, most likely converted into a playable build for PC and Mac platforms on a computer device. It would also serve as an open format to allow the public to explore the two merged environments.

Another compelling format that would be interesting to explore would be to upload this piece onto VRChat, a free online virtual social platform in virtual reality. There are many creators who have created their own custom worlds for people to interact with, all easily accessible both on a web browser or within a VR headset. Users can freely venture into the space and chat with each other inside the space. It would be an interesting format for me to directly converse and interact with participants to gather their thoughts.

IN-PERSON EXHIBITION

During this time, I decided to not have an in-person exhibition at this current time due to COVID-19 concerns. However, for an in-person exhibition I would have liked to have displayed this piece with a simple setup. This would entail a virtual reality headset connected to a desktop computer and a designated space for the viewer, giving them ample room to wander the space without any obstructions in real life. I would also like to include a projector alongside the headset that displays the content on a blank wall, allowing viewers outside of the headset to see what is being experienced by the viewer. This will most likely be a pre-recorded video clip showing the content, while the desktop

screen will present a live real-time view of what is being seen within the headset by the user. During the exhibition, I would also like to gather additional feedback from participants from all different backgrounds.

'THE COLLAPSED SPACE' WITHIN DIASPORIC MEDIA AND ART GAMES

As an arts-based research piece, 'The Collapsed Space' engages with memory in a way that situates itself within the diasporic media creation space, along with the potential for making contributions towards the arts game space as well. The first creator I would like to reference is an artist working in between Toronto and Quezon City named Patrick Cruz whose work focuses on exploring his Filipino heritage and identity in a variety of mediums including painting, mixed media, sculpture and installation. In the piece '*Time Allergy*', Cruz attempts to reconnect with his roots through painting. The painting itself has a chaotic energy with bold lines and colours, capturing his memories of what it was like to grow up in the city of Manila as a child and its hectic environment. The title of this piece refers to how the concept of 'structured time' is a Western idea that was introduced to the Philippines through Spanish colonisation hundreds of years ago, mentioning how, 'We were kind of allergic to this idea of modernity and modernization' (Zarum).

Sifting through personal memories and negotiating an identity that is caught between two different cultures is a consistent theme throughout Cruz's body of work. Cruz's work often grapples with the notion of how cultures get displaced, either because of economic turmoil or other factors that play in those circumstances and is something that is constantly in the back of his mind (Zarum). Although my family was not displaced due to circumstances beyond our control, we did choose to relocate to the West in pursuit of a higher living standard and quality of life. Relating my piece to Cruz's body of work, I can sense a connection within his interests in further exploring the dichotomy of his identity through his memories in his homeland while navigating a new landscape in Canada. It made me reflect upon how my grandmother's house signifies my memories as a child, while my Toronto home demonstrates a 'modern' lifestyle that is much more Westernised. Negotiating a position within these cultural differences in values, concepts, and ideologies between separate countries is a subject I wish to continue exploring as I delve deeper into diaspora studies.

The second creator who I would like to reference is Jeanette Kong, a documentary filmmaker based in Toronto whose work focuses heavily on capturing the stories of the Jamaican Chinese community which she is also a member of. In her documentary *'Finding Samuel Lowe: From Harlem to China'*, the film follows three Black-Chinese siblings who embark on a journey to search for their Chinese grandfather, travelling from Harlem, Toronto, Jamaica, and then to China. Kong's interests lie in focusing on these stories as the Chinese and Jamaican diaspora have often struggled in recording their past. The Chinese immigrant population within the Caribbean have a reputation of being a bit isolated compared to the rest of the Chinese diaspora, and therefore Kong believes it is important to document their stories which are diverse and varied. Kong's films attempt to capture the intersectionality between these two cultures, where many stories may often go unheard.

This film focuses on Paula Williams Madison, a Jamaican Chinese woman who contacted Kong to help research and document her family's history based on seeing her previous film work. Within the documentary, Paula cries when she finally arrives in Jamaica at her grandfather's house. When asked about her personal thoughts on this interaction, Kong responded that she thought this was a very honest and beautiful moment. Paula had hoped to find that house there and seeing that it was still standing made her overjoyed to see that her family was still there to support and share this experience with her. For Kong, filming this documentary allowed for her to also reconnect with China personally, a connection she was afraid would have been lost forever after her parents' passing. Through the making of this documentary and meeting Paula and experiencing her stories, this allowed Kong to reforge her connections with her family in China as well as form new connections with her extended family. Observing how Kong uses her creative practice as a way of reforging her connections with her cultural homelands and experiencing it through exploring the narrative of another member within her community.



Figure 47 Kalonica Quigley's 'Apartment'.

Lastly, I also believe that my research creation piece also has a place within the arts game space. Looking towards indie game developer and 3D artist Kalonica Quigley, and her game *'Apartment'*, we can see games being used as an art form for engaging with personal memory and lived experiences. *'Apartment'* is a short game piece that allows the player to revisit Kalonica's old apartment, recreated digitally from memory. Venturing through the space, the player can interact and click on every single object, where a short line of dialogue will appear describing a memory attached to it.

'Apartment' shows us that places and everyday objects can contain memories attached to them that carry very special personal significance for each individual. From looking at these creations within the diasporic media sphere and the arts game making space, I believe that my work can deepen the perspectives of not only my community, but also express my own identity as an individual. Diasporic media creation pieces as arts game pieces can allow the creator to reconnect with their own heritage, engage with personal memories and stories from within their community, and communicate experiences and stories that often do not receive a lot of representation. This is especially important for marginalised communities, where often there are many experiences that are

left unnoticed or forgotten. Without proper documentation of these stories, connections to our estranged roots may easily be lost over time.

CONCLUSION

Throughout the research-creation itself, I have discovered some ways arts-based game design research can spur creativity and connection to personal memory and lived experiences. Deep mapping my connections amongst myself, my immediate family, my grandmother, and the estranged part of my mother's side of the family has encouraged me to seek out lost familiarity and memories to the space once more. I concluded that memories could be made tangible and interactive through recreating environments within virtual reality, giving them context and visualisation. The context in which these memories were given within my research creation allowed for other perspectives from my other family members to flourish. After completing a significant chunk of work, I would document my findings through auto-ethnographic methods, along with gathering feedback from my family members. The research gathered from these processes in turn would help inform the research creation piece and vice versa. Using deep mapping as a primary method of research, I discovered that two-dimensional maps can be heightened to include a variety of mediums, layered in a rich and sensory way. This virtual reality map was purposely left open-ended to include future perspectives and voices, adding to the possibility for narratives to change as new knowledge is discovered.

Through my findings, I have discovered that memory can be a collective experience and accumulated out of many quotidian moments. This research creation was very much done with the intention of furthering my knowledge about my own family and heritage done through memory. Many of these moments are based on personal experiences that perhaps feel very specific, however through this research I hope that virtual reality can pose as a compelling tool used within diasporic communities. Virtual reality as a form of storytelling is an immersive experience is something that is unique to the medium that perhaps currently can't be seen anywhere else. It allowed my family members to feel as though they were part of the experience, taking on a position inside of the piece rather than standing from an external perspective. I learned that memories could continue to be contested and challenged, complicating, and diversifying an already complex diasporic identity.

This thesis was a large undertaking to complete as one person, however I intend to continue adding to this space, possibly continuing to let it evolve as years go by as I continue to document new information and memories. Given the flexibility provided by game engine software and tools, there is always room for additional content to be included, allowing new knowledge to be generated in response to added changes as well. In the future I would also like to incorporate more sounds and flesh out the fidelity of this experience. It would also be interesting to expand upon this environment, adding more content to the map such as building out the second level to my grandmother's house or building out the rest of the neighbourhood in the surrounding area. I would also like to find interesting ways of overlapping my Toronto living space, to integrate other parts of the house and other ways of artistically integrating more of my 2D illustration practice.

As my knowledge of working in 3D continues to develop, I believe that this will enhance my storytelling capabilities within virtual reality, better understanding myself while allowing others to better understand my own personal narratives and identity as well. With my research, I propose that this can be used as a framework for personal diasporic exploration within virtual reality, taking advantage of its unique ability to embody the user. Using an iterative process that progresses through stages of collecting data, self-reflection during the making practices, and gathering new insights and data from my family members afterwards will continue to allow the deep map to continue to develop. Through this design framework, I would encourage people to consider in depth the artistic decisions of the space, incorporating a variety of mediums into the piece and expanding upon any previous creative practices if they are new to creating virtual reality. Welcoming a multiplicity of diverse voices will be important for creating a varied map that can encompass a wide range of memories. This process is meant to be open-ended, experimental, and media rich allowing for the possibilities of including new perspectives well into the future.

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APPENDICES

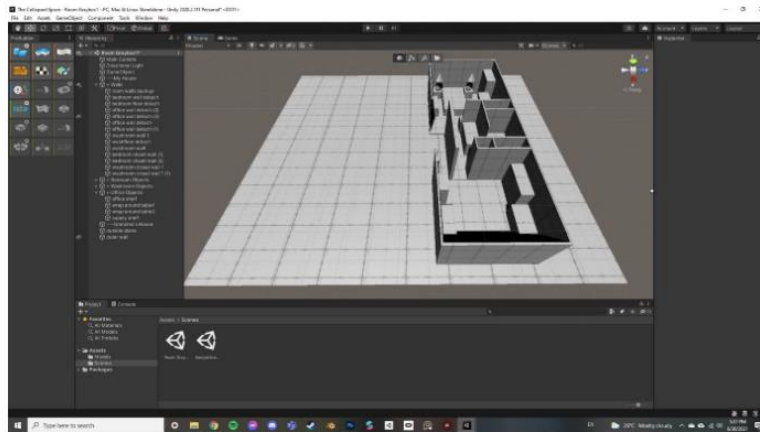
FIRST BLOG POST

Blog Post: Greyboxing level screenshot.



#1 — Graduate Thesis VR Dev Blog

First progress blog post on developing my Master's thesis at OCADU.



Greyboxing my first level in Unity using ProBuilder.

Figure 48 Blog Post: Greyboxing level screenshot.

Starting Summer 2021, I began my progress on developing my Master's thesis at OCAD University as part of the IAMD program. My methodologies include research creation—allowing my making practices to help inform my thinking processes and creative auto-ethnography. I am interested in using game engines, 3D modelling software, and possibly VR technology in the creation of this piece to investigate my identity as a person of Mainland Chinese diaspora. This blog post documents my progress from 06.14.21 to 06.26.21.

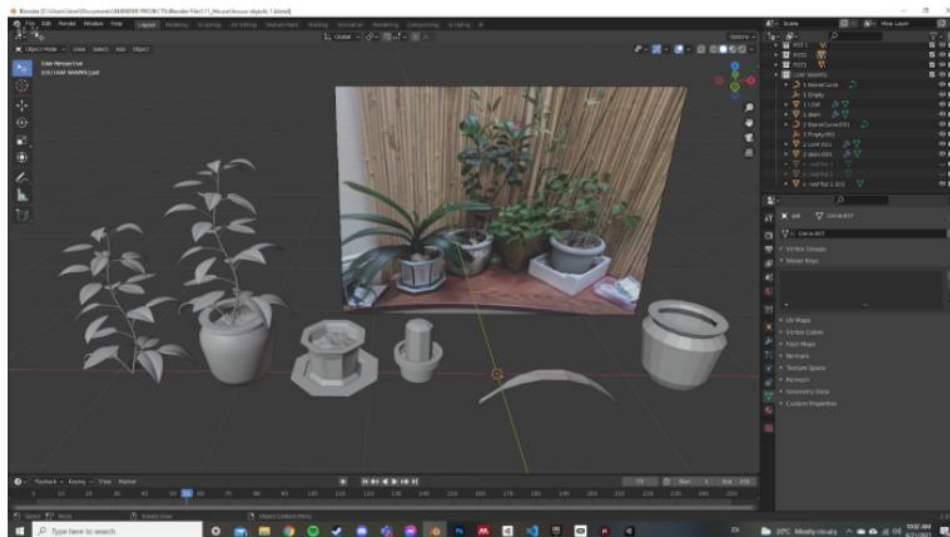
The following is a list of personal goals I would like to achieve:

- *Improving my 3D modelling skills in Blender*
- *Become familiar and more confident with Web XR, VR/AR tools*
- *Gaining proficiency in game engines such as Unity and Unreal Engine as*

well as learning some basic coding and programming skills

I first began my exploration and experimentation progress by trying out different VR drawing tools and software on my Oculus Quest 2 headset. This included trying out apps such as Tilt Brush, SculptVR, and Quill. I also contemplated the idea of possibly creating a web VR piece using A-Frame. However, after completing these initial exercises, I landed upon deciding to use a combination of Unity and Blender for the creation of this thesis, both of which are what I have become the most familiar with using (albeit, still at a beginner level) when working in 3D.

I spent last year learning how to use the Blender program. While jumping back into it this summer, I decided the best way would be to work from real life and looked towards referencing the houseplants within my home. I felt this was the best way of re-familiarizing myself with the program's tools.



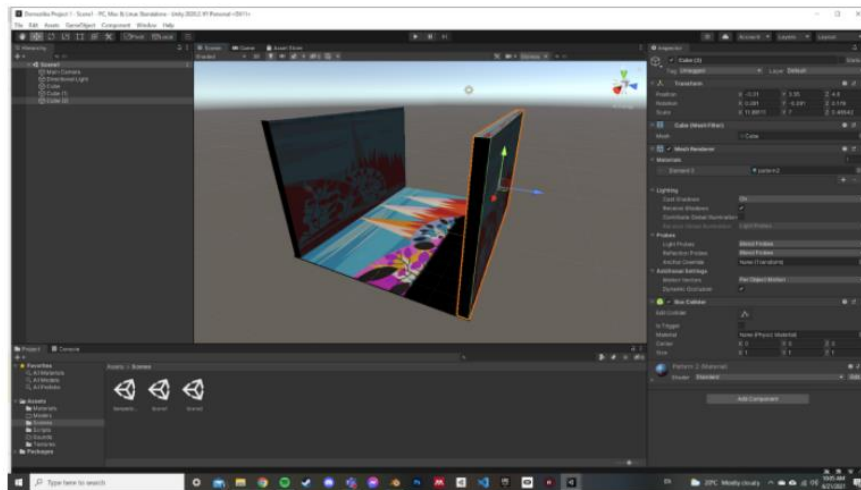
3D modeling houseplants from my home.

Figure 49 Blog Post: 3D Modelling houseplants in Blender.

Recreating my houseplants in 3D led to the idea of recreating actual rooms and spaces within my own home, which have become all too familiar and intimate to me after spending 99% of my time here during the pandemic. I thought it would be a cool idea to turn my own life into a 'video game', creating a digital version of the 3 spaces that are the most personal to me — the bedroom, washroom, and studio office. While being separated from friends and family during COVID-19, I believe there is a strong collective desire felt

across the world to travel once again. Speaking from a personal perspective, I would desperately love to see my family in China again and visit my grandmother's house in Shanghai. I have fond memories of visiting this house at numerous stages in life. My grandmother's home in China and my home in Canada have been the two major formative spaces that have defined my identity.

After deciding on a particular focus for my thesis creation, I began familiarising myself with Unity's interface. The following are screencaps of my learning progress on how to create objects and apply my own textures to them.



Learning the Unity interface, importing textures created from my own illustrations.

Figure 50 Blog Post: Experimenting with textures in Unity.

My primary advisor on my thesis project — Emma Westecott, advised that I commence building out the level in Unity as soon as possible and start importing models to test them out within the engine. During this process, I learned the concept of video game design called 'greyboxing' — creating a rough prototype of the level directly within the game engine, essentially a sketch of what the design layout will look like that is ready

to be playtested at any moment. Greyboxing allows for the game level to be mapped out right away, making the development progress more efficient and helping to determine the scale of each object more easily. The tool I used for this was a Unity plugin called ProBuilder.

This first iteration of my greybox progress shows my living space layout, recreating my bedroom, washroom, and studio office space. The left side of the map is left open to start building out the level that will connect to my grandmother's house in Shanghai.

Some questions raised after my first greyboxing experiments:

- *How accurate should I stay with recreating my living space in real life?*
- *Will the 3D style of the models adhere to realistic looking materials and textures? Or will there be more of an abstracted stylistic look that involves more of my 2D illustration practice?*
- *Will I place objects in the 3D space that actually don't exist in the space in real life? How far-fetched can these objects be?*

For me personally, I believe there can be some free agency in deciding to place a doorway in a wall that doesn't exist in real life if it is meant to help improve the player's experience of walking through the level. I think if it is able to provide a more seamless 'looping' sensation, then I am willing to let go of aiming for a 100% accurate representation of what these spaces look like in real life and can draw from the actual environments as more of a loose inspiration for the piece.

— *MDes Thesis, IAMD Program at OCAD University. Primary Advisor: Emma Westecott.*

SECOND BLOG POST



Jenn Liv

Oct 21, 2021 · 5 min read · Listen



#2 — Graduate Thesis VR Dev Blog

Second progress blog post on developing my Master's thesis at OCADU.



Second iteration of 'The Collapsed Space' level prototype in Unity.

Figure 51 Blog Post: Greybox level of my grandmother's house.

Moving forward on my progress over the summer, I continued with grey-boxing my game level in Unity using the ProBuilder plugin. ProBuilder is very useful for fast prototyping, using 3D modelling tools that are intuitive and simple to create game design levels. The advantage of using such a plugin within Unity is that you can quickly map out a level design and it is ready to be playtested right away. Once I was happy with the overall design, I moved on to exporting my level as a playable VR demo for my Oculus Quest 2 headset.

Learning how to create my very first VR app was quite a challenge, however also a very exciting process at the same time. It took a lot of trial and error attempts to get a playable build running and viewable on the headset. I used a combination of resources from Unity Learn, YouTube tutorials, and reading the official Oculus documentation on developing with Unity to guide my process. The biggest issue was making sure Unity was correctly installed with the proper Android SDK build tools and finding an installed

version of Unity that was compatible with the tutorials I was following. What I learned was that Unity updates VERY frequently, and therefore it is important to pay attention to which version of Unity you're using.

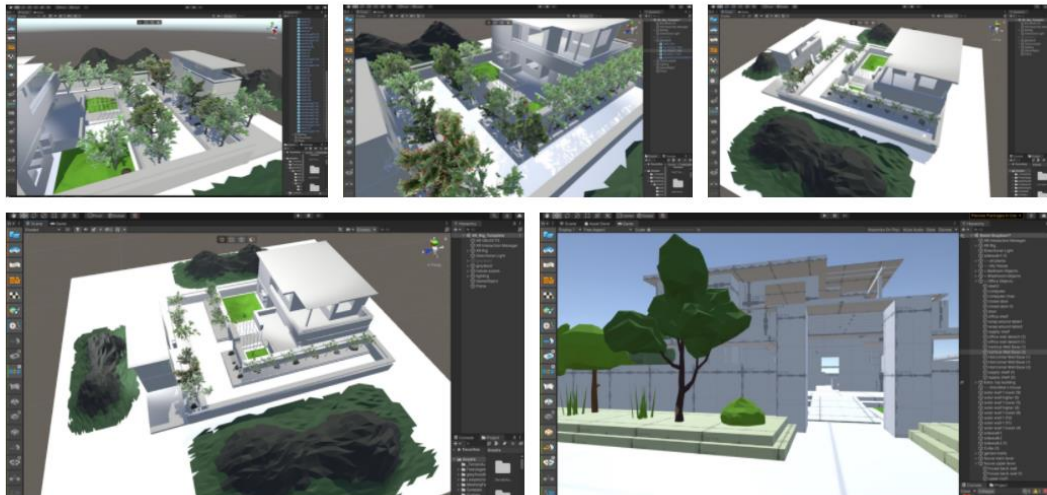


Figure 52 Blog Post: Greybox level of my grandmother's house.

Once I had finally gotten a playable demo viewable on the headset, it was very fulfilling and satisfying to see my level in virtual reality for the first time. From doing a playtest and seeing the app for myself, I was able to notice what needed revising right away. Although there were many things that needed to be fixed, I was very proud of myself for achieving this step. Playtesting allowed me to observe changes I needed to make such as realising that the doors were too narrow, the overall environment felt too small, and that the player camera eye-level felt too 'tall' and was poking through the ceiling in my grandmother's house. I also noticed that there was a slight sensation of 'floating' as the player was moving with the locomotion settings I had entered within Unity.

After taking notes on what needed to be fixed, I went back and edited the level within Unity again to account for the changes. I scaled up the entire environment and added an additional level to the Toronto living space to make the Shanghai street feel less awkward when the player exits the Toronto portion of the level. I also imported

some free nature low-poly assets from the Unity asset store to help add feeling to the environment and to help me visualise more of what needed to be adjusted in the level design. Creating a separate window for the 'Game' view helped immensely with getting a quick sense of the player's view.



More work-in-progress shots of the game level.

Figure 53 Blog Post: In-progress shots of the greybox.

When the new revisions were complete, I re-imported all my assets into the Unity file with my VR setup and proper packages installed and created a new playtest. Again, it was a series of trial and error from here onwards, figuring out things that needed to be tweaked, and adjusting level elements to make sure that the environment was at the scale that I wanted the player to experience my level at. I also experimented with adding placeholder assets to surround the buildings in the level, such as adding low-poly mountains to give a sense of 'landscape' and depth to the environment. All these free assets from the Unity store are currently placeholders. I will eventually swap these out for my own 3D modelled assets created using Blender.

During this stage, I also learned how to add more lighting to the scene by adding two spotlights to illuminate light coming in through the windows of my Toronto living space and the front windows of my grandmother's house in Shanghai.

Things that I took away from this experience:

- Having the correct Unity install and packages is very important!
- Playtesting is a crucial step in making sure that the environment objects are to

the correct scale according to the player's view

Next steps:

- Adjusting the locomotion to 'teleportation' mode instead of 'continuous' mode to reduce the feeling of motion sickness
- Adding basic VR interactions to the level such as grabbable object

Now that I am happy with my level's prototype, I will begin swapping out the grey box level with 3D models made in Blender, using the prototype as a guide for all my modelling

— *MDes Thesis, IAMD Program at OCAD University*

Primary Advisor: Emma Westecott. Secondary Advisor: Immony Men