

Embosom: Exploring the Concept of Home Through a Multi-sensory Virtual Reality Installation

by

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Abstract

This research delves into the potential of multi-sensory Virtual Reality (VR) installations in exploring the notion of home from the perspective of diaspora. Through Embosom, a VR sculpture installation that blends virtual reality, sound, and touch, a distinctive dual spatial environment is created that enhances the viewer's sensory experience and evokes physical and emotional comfort. This research also explores the relationship between the concepts of "home" and "diaspora," recognizing that they are intertwined. Viewers are enveloped by a soft sculpture that resembles a home, manifested through the form of a hugging sculpture. Simultaneously, wearing a VR headset, they are presented with dreamy motion graphics depicting homes made of sparkling particles, along with various structures such as windows and doors. Embosom offers an experience providing reflection on the concept of home by intersecting the boundaries of the real and virtual worlds and taking viewers on an imaginative journey. As viewers navigate through Embosom, a sound piece plays in the background, adding to the overall experience with its calming and meditative effects. This research draws on principles from the fields of phenomenology and psychology of home that inform the design process. Utilizing research creation and case study approaches, participants' feedback was gathered via an interview questionnaire and a survey, indicating that the installation reduced anxiety and increased calmness. This research underlines the potential that arises when art and technology converge to explore how individuals from a diasporic background perceive and imagine the concept of home within a multi-sensory VR installation.

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1. Introduction

Embosom is an art installation that delves into the complex themes of home and the journey of diaspora exploring the experience of moving to a new home. Participants are invited to engage with the installation by sitting on a soft sculpture and immersing themselves in a multi-sensory experience that combines engaging VR visuals with a carefully curated sound piece. As presented by Milgram and Kishino (1994) in their paper titled "A taxonomy of mixed reality visual displays", Virtual Reality (VR) is an immersive experience where users are placed in a fully artificial environment. This environment can replicate the characteristics of real-life settings, whether existing or fictional. Additionally, VR can create a world that defies the laws of space, time, mechanics, and material properties, surpassing the boundaries of physical reality (Milgram and Kishino 1994, 2). The unique features of Virtual Reality provide artists with immense creative freedom, resembling the boundlessness of imagination. As a result, in this thesis I argue that VR is one of the most effective mediums to create an immersive experience that triggers participants' imaginations and opens new horizons for them. Immersion and imagination are closely related in the context of experiencing artwork. Immersion refers to the feeling of being fully engaged and absorbed in an experience, where the boundaries between the real world and the artwork's world begin to blur. On the other hand, imagination is the ability to form mental images or concepts of something that is not present in one's immediate surroundings. To establish arguments about the origin and effects of my art-based research, I will draw heavily from Jean Paul Sartre's book "The Imaginary" (Sartre 2010) and its phenomenological views on human imagination and art.

In *Embosom*, I examine the concept of "home", "sense of home," and "perception of home" through the lens of diaspora, recognizing that home and diaspora are interconnected. To this end, I draw from relevant literature on the diasporic experience of home. While the field of diaspora studies has traditionally focused on the experiences of loss and integration into new cultures, as Bhandari (2021) states in their review article "the genre has moved away from a tragic mode linked to the experience of diaspora as loss, nostalgia, and a longing for the past. It embraces the appealing theme of positive immigration and self-reinvention abroad" (Bhandari 2021, 103). Going along with this shift in narrative, *Embosom* seeks to offer a fresh perspective on the fluidity of the idea of home in the modern world. By presenting a positive spin on this concept, the installation aims to inspire a sense of hope and renewal in participants. As an individual who has immigrated twice on my own, both as an Iranian and a Canadian, I aim to portray a positive and realistic perspective on the concept of home in diaspora. My goal is to design an immersive, dual spatial experience that transports the viewer between a nostalgic notion of home to a newly established one, representing transition and rebirth within the context of home and relocation. Through this installation, I hope to also inspire others who have gone through similar experiences to embrace their emotions and experiences and see the beauty in the journey of immigration and their current homes.

I designed this research to specifically explore how a multisensory VR experience captures the essence of home and its fluidity for people identifying as members of east Asian or middle eastern diaspora. Additionally, this study investigates the immersive impact of incorporating sound and a physical sculpture with a soft texture into the installation. To assess the participants' reflections, I used a case study as my research approach. Twelve users were invited to experience *Embosom*, providing valuable insights into their emotional responses and personal interpretations of the installation. These users provided feedback through a survey and an interview questionnaire. This research mainly relies on reflective thoughts and user feedback as there is an inherent certainty in a phenomenological description (Sartre 2010) which allows for this approach.

A phenomenological approach is characterized by its attentiveness to the concreteness of both the artwork and our experience of it, and it aims to find descriptive vocabulary that can adapt to this concreteness (Crowther 2009, chap. 1). Hence, I explored the impact of this work through the lens of phenomenology and psychology, putting emphasis on participant's phenomenological and descriptive comments as well as a survey on emotional response. My aim with the VR visual is to create an experience that blurs the line between the real and the imaginary, which is a characteristic of art (Sartre 2010, 189). Sartre's concept of the "imaginary" also suggests that interpretation involves a complex interplay between the artist's intentions, the viewer's perceptions, and the subjective meanings and associations that arise from the interaction between these elements (Sartre 2010, 188-194). This research is designed to give freedom to participants by asking them to engage with the artwork in their own unique ways including answering interview questionnaires and providing verbal feedback. The following outlines various elements of the installation and its design in more detail.

By blending static objects like windows and walls with the dynamic movement of sparkling particles that make up the walls, I aim to communicate the fluid nature of the idea of home. These movements also represent the liquid nature of home and diaspora. The VR visual depicts a room as a constellation of sparkling particles that represents the concept of home and its ever-changing nature. The particles disappear and reappear in space, emphasizing the idea that home is constantly in motion and evolving. Particles used in VR visuals represent the physical objects and experiences that fill a home, showing that it is not just a place but something that is part of us and that we carry with us wherever we go.

The sound piece accompanying the VR visuals is an integral part of the overall immersive experience. It aims to add depth and richness to the installation, creating a multisensory experience that engages both sight and sound. The sound piece is a mix of humming, forest, and breathing sounds. The sound component created by Evan Prosser (OCAD Alumnus) is carefully curated with an intent to evoke a sense of calm and wonder, enhancing the calming VR visuals. The humming sounds create a meditative and soothing atmosphere, while the forest sounds bring a sense of nature and the outdoors into the space. The breathing sounds provide a reminder of our own physical presence within the installation, while also tying into the overall theme maintaining a grounding element despite the volatility of displacement. Based on the feedback from the participants of my case study, the sound complemented the visuals seamlessly, resulting in a fully immersive and transcendent experience. This allowed viewers to explore the concepts of home, fostering a sense of comfort and connection with the artwork.

The third element is the hugging physical sculpture, intended to provide a grounding experience for the viewer. Moving to a new place often entails various types of social and emotional losses. The sculpture can serve as a comforting and welcoming presence in the home, adding to its overall warmth and comfort. Through the physical element of this work, I explore the impact of physical enclosure in the form of a hug in distilling a feeling of support and familiarity. Feedback from participants indicated that the physical sculpture in the installation, which features various fabric textures reminiscent of home, provided a sense of comfort and contributed to their overall immersive experience. I used a variety of fabrics aiming to resemble carpets, couch cushions, and even pet fur. Although, according to the case study, touch was not the dominant sense that affected participants' experiences, a few participants mentioned that certain fabrics reminded them of their beds or couches at home.

Embosom is informed by my own experiences as an immigrant, as well as peer feedback and case study outcomes. Through this work, I have delved into my own past and rediscovered my feelings towards the concept of home. This project holds significant value in its ability to delve into the emotional and psychological impact of an immersive installation on participants' perceptions of home and relocation. The immersive nature of *Embosom* enables visitors to connect with the themes of the diaspora and home in a deep manner, allowing them to reflect on their own experiences and emotions surrounding the concept of home. Moreover, this project has served as a tool for self-reflection and personal growth for me as an immigrant artist. The process of creating this installation has allowed me to confront and explore my own experiences of migration and displacement. It has also provided me with an opportunity to gain a deeper understanding of the complex and multifaceted nature of the diaspora,

and to share this understanding with others. Ultimately, this project has helped me to become more open and receptive to the journey I had and the path ahead, both as an artist and as an individual navigating the complexities of immigration and home. *Embosom* is informed by the literature I have read, my own experiences as an immigrant, as well as peer feedback and case studies. This project represents an important contribution to the ongoing conversation surrounding concepts of home and relocation within diaspora communities.

My research aims to investigate the potential of multisensory VR sculpture installations - combining virtual reality, sound, and touch - to explore the psychology of home, enhance the viewer's sensorial experience through a dual spatial environment, and induce a sense of physical and emotional comfort. The structure of the thesis is designed to provide a clear and concise overview of the research process and the findings of the study. The literature review was the foundation of the thesis, as it provided a comprehensive understanding of the existing research in the field and established my research goals and questions. The methodologies chapter outlines the principles considered when doing this research as well as the approaches taken to address the research questions. This section includes a selection of principles (psychology of home and phenomenology), case study and research creation as main research approaches, and at the end the ethical considerations in this research are discussed. The methods chapter discusses different methods this research incorporated to build the VR sculpture installation. The outcomes chapter presents the findings of the study and offers my interpretation of the results. This section provides a detailed analysis of the data collected and offers insights into the research questions. Finally, the conclusion summarizes the main findings of the study and introduces suggestions for future research. It reflects on the research process, how it affects my future practice, and provides an evaluation of the study's outcome.

2. Literature and Contextual Review

This chapter presents an overview of the relevant literature and artists' works that are associated with the themes under investigation. The purpose of this section is to offer a review of the existing literature and artworks that have addressed similar topics, and to offer insights into the key ideas and theories that inform the research. By examining the works of artists and scholars in the fields of phenomenology and psychology, this section aims to provide a contextual framework for the current study and situate it within the broader discourse.

2.1. Psychology of Home

In psychology, the concept of "home" is generally defined as a place or environment that an individual feels emotionally and psychologically connected to. According to the participants of my research, home is often associated with feelings of safety, security, comfort, trust, and familiarity. By tapping into the psychology of home and the emotions that it evokes, *Embosom* has the potential to create a sense of comfort and safety, while also serving as a sympathetic representation of the idea of home.

In "Understanding home: a critical review of the literature", Shelley Mallet (2004) looks at this concept through different lenses including psychology. According to Mallet, traditionally, home and homeland have been viewed as important sources of identity and a sense of belonging (Mallet 2004). In psychology, attachment theory suggests that humans have an innate need to form close and enduring relationships with others, and that the home is a primary attachment figure for many people. From this perspective, home is seen as a place of safety, comfort, and security, and the loss of home can lead to feelings of sadness, anxiety, and displacement. In attachment theory, home is often seen as a specific geographic territory, with a strong emphasis on location in defining one's home (Mallet 2004). In modern psychology, there has been a shift towards a more nuanced understanding of the relationship between individuals and their home and homeland. According to Mallet, some modern theorists have proposed that the notion of home may not be inherently linked to a particular physical setting but can be a more abstract concept that is based on emotional attachment and a sense of belonging. Others have argued that the experience of migration and displacement can lead to the formation of new and complex identities that transcend traditional notions of home and homeland (Mallet 2004).

Another work I want to draw from is "The Poetics of Space", a book written by Gaston Bachelard. In the "Poetics of Space", Bachelard explores the concept of space and how it relates to human emotions, memories, and imagination, in a more poetic way. Bachelard argues that our perception of space is shaped by our personal experiences and cultural context, and that spaces have a poetic dimension that can be explored through literature, art, and philosophy (Bachelard 2014). This book inspired my ideation process for designing my VR visuals, leading me to incorporate elements of home that carry both psychological and symbolic meanings. This eventually led me to use windows and doors in my VR experience as symbols of hope and change.

In *Embosom*, I examine the concept of "home", "sense of home," and "perception of home" through the lens of diaspora, recognizing that home and diaspora are interconnected. One cannot fully understand the diaspora without understanding what home means, and vice versa. In the following section, I will narrow the scope to examine home from the perspective of the diaspora community.

2.2. Psychology of Home in Diaspora

This research focuses on the unique psychology of home in the context of diaspora, with a specific emphasis on home as perceived by diaspora. Diaspora is commonly used to describe the movement of a large group of people who establish new settlements and communities as a result of migration. The term was originally used to refer to the dispersion of the Jewish community, but it has since been applied to a range of transnational migrations and community formations (Bhandari 2021). There is no single, universally accepted definition of diaspora, and different theorists have varying interpretations of the concept. To contextualize the concept of home within the context of diaspora, it is crucial to establish a clear definition of the term diaspora.

I will use the works of William Safran (Safran 1991) and Robin Cohen (Cohen 2022) to situate how the definition of diaspora is positioned in my thesis. William Safran is a political scientist who is well-known for his contributions to the study of the diaspora, particularly his concept of "diaspora consciousness" (Safran 1991). Safran's work explores the ways in which diaspora communities maintain connections with their homelands and form transnational identities. Robin Cohen is a sociologist who has written extensively on diaspora and migration. Cohen has contributed to the development of the concept of diaspora, particularly with his emphasis on the importance of transnationalism and the interconnectedness of diaspora communities. According to the works of Safran and Cohen, the diaspora is defined by its relationship to home.

Safran believes that the main characteristics of diaspora include:

- Diaspora refers to a scattered population with a common origin or ancestry who maintain a relationship with their homeland.
- Diaspora involves a sense of displacement and the longing for a return to the homeland.
- Diaspora communities maintain a collective memory and identity that is shaped by their experiences in the host society and their connections with their homeland.
- Diaspora communities form transnational networks that allow them to maintain connections with their homeland and with other members of the diaspora.
- Diaspora consciousness is a key aspect of the diaspora and involves a sense of belonging to the diaspora community and a commitment to maintaining its culture and identity (Safran 1991).

Cohen's definition of diaspora is more comprehensive, with relevant characteristics to this research including:

- Diaspora refers to a group of people who have been dispersed from their original homeland or ancestral territory.
- Diaspora involves a sense of identity and belonging that is tied to the homeland, but that is also shaped by the experiences of migration and settlement in the host society.
- Diaspora communities are characterized by their transnationalism and maintain connections with their homeland and with other members of the diaspora around the world.
- Diaspora communities are dynamic and constantly evolving, and may be shaped by political, economic, and social changes in both the homeland and the host society.
- Diaspora communities may play an active role in shaping social and political change in both the homeland and the host society and may form important transnational networks that facilitate communication and collaboration across borders (Cohen 2022).

The focus of my research is on examining the concept of "home" and how diasporic communities develop a "sense of home" while navigating changing environments. While I recognize William Safran's emphasis on loss, my views align more with Robin Cohen's perspective on the transnational and liquid nature of the diaspora. It is also important to note that the idea of "home" could change over time, and that the relationship between an individual and their homeland may also change over time. It is crucial to keep these complexities and nuances in mind when

discussing the concept of home in diaspora, and to recognize that there is no one-size-fits-all definition or experience of diaspora. Current research in psychology about immigration often focuses on unfavorable health consequences such as depression and anxiety, leading to the “assumption that immigrants are at greater risk for poor well-being compared to native-born individuals” (Cobb et al. 2019). However, from a positive psychology perspective, despite facing many challenges related to migration, many immigrant populations indicate favorable patterns of psychological well-being (Cobb et al. 2019).

As someone with a diasporic background, I understand the complexities of the concept of home. In my experience, home may feel distant both temporally and spatially, but it can also serve as a carrier of hope for positive change. My research aims to shed light on these complexities of the concept of home in diaspora, and the emotional and psychological experiences associated with it (Mallet 2004). To comprehend the concept of home is to examine the elements that create a sense of familiarity and comfort in an ever-changing world where one's location and sense of belonging are constantly in flux. For individuals in diaspora, maintaining a connection to their culture and homeland is crucial for feelings of security and familiarity. According to Saroja Mandal in their article “Concept of Home in Diaspora”, the preservation of home encompasses not only physical spaces and personal relationships but also a sense of safety and security, and change (Mandal 2021). Drawing on this theory, the central theme of my immersive VR sculpture installation is to explore and allow for an experience of the concepts of safety and comfort within the context of home through the lens of the diaspora community.

2.3. Phenomenology of Immersive Art Installations

This thesis utilizes a combination of phenomenology and psychology of home to understand and analyze the subjective experiences of participants in an immersive art installation. Phenomenology, as a philosophical viewpoint, emphasizes the first-person perspective and focuses on the sensory qualities of objects to understand their meaning (Crowther 2009). This approach allows the researcher to understand the effects of the artwork through self-reflection and the experiences of the participants, rather than solely focusing on the objective reality of the installation.

In this section, I introduce the philosophy of Jean-Paul Sartre based on his book “The Imaginary.” Jean-Paul Sartre was a French philosopher (Stanford Encyclopedia of Philosophy) and “The Imaginary” is one of his philosophical books first published in 1940. The book explores the nature of imagination and its relationship to consciousness and perception. Sartre argues that imagination is not a passive faculty, but rather an active process that shapes our understanding of the world and our place in it. He also explores the ways in which imagination can be used to create and sustain illusions, and how these illusions can be used to reinforce our sense of “self and our place in the world” (Sartre 2010). This book explores the role of the imaginary in perception, consciousness, and the formation of the self. Sartre argues that imagination is not a faculty of human consciousness, but rather that it is consciousness itself. In the book, he also discusses the role of the imagination in the creation and appreciation of art, arguing that art is a product of the imagination and that the process of creating and interpreting art involves the use of mental images and representations.

Another work I draw from in this work is “Phenomenology of the Visual Arts (even the frame)” by Paul Crowther. The book explores the relationship between visual arts and phenomenology as a philosophical approach that focuses on the study of subjective experiences and consciousness (Crowther 2009). In the book, Crowther argues that art is not just a visual experience, but it is also an embodied and subjective experience. He explores how the experience of art involves the interaction between the viewer and the artwork, and how this interaction is shaped by the context in which the artwork is presented. The book also examines the role of the frame in shaping our perception of art. Crowther argues that the frame is not just a decorative element, but it is also an integral part of the artwork that influences our experience and interpretation of it. This book provides a thought-provoking

analysis of the relationship between art and human experience. Subsequently, I incorporated the significance of framing into the design of my physical installation.

In addition, the sense of touch is another sensory element that I consider to be important in my immersive VR sculpture installations. In the phenomenology of touch, the focus is on how touch shapes our experience of ourselves and others, and how it shapes our understanding of the world. “Maurice Merleau-Ponty was a French philosopher and public intellectual” (Stanford Encyclopedia of Philosophy) who wrote in depth about the phenomenology of touch. He argues that touch is a unique mode of perception (Moran 2010). He believed that touch is a fundamental way in which we experience the world, and that it is intimately linked to our perception of space and the body. Merleau-Ponty argues that touch is different from other modes of perception, such as vision or hearing, because it involves direct bodily contact with the world. His theory inspired me to incorporate a hugging soft sculpture into my installation.

2.4. Virtual Reality

For designing the VR visuals in my installation, I was inspired by existing meditative VR visuals as a starting point. I chose the Oculus goggles as my Virtual Reality equipment. There are several apps and games on Oculus that offer calming visuals, such as guided meditations, relaxation exercises, and calming scenes. The “TRIPP” app visuals were a major inspiration for designing calming experiences in my VR installation. Some of the calming visuals one can experience in TRIPP include serene natural landscapes, colorful abstract patterns, and tranquil underwater scenes (Holley et al. 2022). The experiences in this app influenced me to use sparkling particles and motion graphics in representing home and immigration in a calming manner.

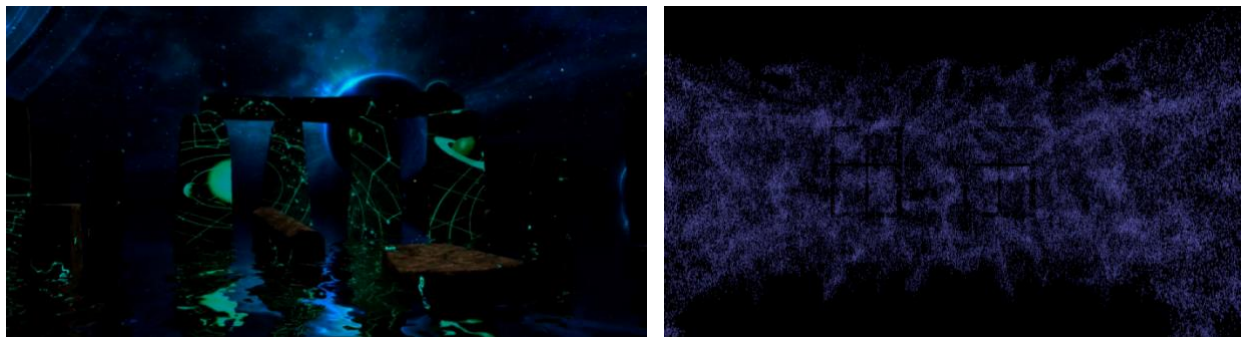


Figure 1. Left: A screenshot of the TRIPP app visuals. (Alexander. “Fokus Meditation in Virtual Reality: Tripp Für Oculus Quest.” VR, April 22, 2021. <https://www.vr-guides.de/focus-meditation-tripp/>.) Figure 2. Right: Screenshot of *Embosom* VR visual

TRIPP app visuals also inspired me to use a dark background in my VR visuals. Dark backgrounds can create a sense of depth and space, while also allowing bright colors and lighting effects to stand out more vividly. Plus, particles can create a sense of liveliness and responsiveness that can enhance the participant's immersion in the experience.

2.5. Sound

In this section, I explore the significance of sound, its emotional impact, and its differences from other sensory stimulations. Senses are not just passive receptors of information but are active participants in the creation of knowledge and understanding (Serres 2008). Serres argues that hearing and vision are fundamentally different in the way they interact with the world. Vision, according to Serres, is a sense of distance and detachment. In contrast, hearing is a sense of proximity and contact. This makes sound an intimate component that can further

enhance the immersive and engaging nature of virtual experiences by creating a sense of presence and realism. Serres argues that sound is inherently temporal in nature, in that it is constantly changing and unfolding over time. Unlike vision, which allows us to take in an entire scene at once, sound is constantly moving and evolving, and its meaning and significance can shift depending on its context and the other sounds around it (Serres 2008). Based on this theory, I used the sound component of my project, *Embosom*, to create a sense of home and proximity as well as making participants feel more grounded and open to new experiences.

The use of sound in *Embosom* is also inspired by an artwork created by by Jón Þór Birgisson (Jónsi) in 2021 titled *Obsidian* (Johnsen 2022). This installation replicates the experience of being inside a volcano. The artist was unable to travel to his homeland to visit a specific volcano that he had frequently visited in the past. However, his longing for home and the feelings associated with being away from it served as an inspiration for his work. The artist decided to use sound as a medium of recreating a memory because it has more immediacy than images. While the artist is trying to replicate a phenomenon, they still use ambient sounds that are general enough to leave room for participants' imagination. Jónsi also has an album with the same name *Obsidian* that was released in 2020. In this album he uses atmospheric soundscapes and emotive vocals to create an otherworldly, dreamlike quality that was aligned with my goals for *Embosom* to be an immersive and thought/memory provoking experience. By using ambient sounds, music, and sound effects, the artist can transport participants to a different world or create a particular mood that fits with the intended experience.

2.6. Materiality

Materiality in art installations refers to the physical properties and materials used in the creation of the artwork. The choice and use of materials can greatly influence the overall aesthetic and conceptual meaning of the piece. Materiality can also play a role in how the artwork is experienced by the viewer. As Serres notes, touch is a highly versatile and multifaceted sense, capable of conveying a wide range of information and sensations (Serres 2008). This makes touch and materiality an excellent way to convey intimacy, connection, and presence. There are also many contemporary artists who explore the theme of touch in their work. For example, Michelle Vine creates interactive installations that invite the viewer to physically engage with the artwork, such as through touch, movement, or other forms of physical interaction (Mattina 2021).

In this piece, *Embosom*, I aim to evoke feelings of relaxation and comfort through materiality and physical sensations. As discussed above, the materiality of the artwork often plays an important role in the meaning and impact of the work. Driving from the theory of Serres and works of Michelle Vine, my sculpture uses an element of hug and different textures of fabric to both provide comfort and evoke memories of home. Using different fabrics, I seek to highlight the physical context of home and emphasize the close and intimate relationship we have with it. The sense of home encompasses both physical and mental comfort, making the sensory experience of comfort a key element in this artwork. To emphasize this, I have included elements such as the option for the viewer to recline, which was inspired by Michelle Vine's artwork featuring a bathtub. The incorporation of these elements reinforces the themes of safety and stability in *Embosom*.

2.6.1. Michelle Vine

Michelle Vine is a contemporary installation artist whose work focuses on creating immersive and interactive art experiences that engage the sense of touch. Her work is centered on exploring the sense of touch through a phenomenological lens. By using techniques informed by affect theory, sensory neuroscience, and her own experiences of neurodivergence and chronic illness, she aims to bring attention to the often-neglected sense of

touch and disrupt the dominance of sight in the art experience. Her practice centers on investigating the body and the gallery as sites for sensory knowledge formation (Vine 2023).

Vine's artworks are designed to be accessible and inclusive, inviting a wide range of audiences to engage with them through physical interaction. Michelle Vine's installations immerse visitors in a multi-sensory experience, inviting them to engage with various fabric textures and sounds. Visitors can relax in a plush bathtub, listen to soothing recordings by Vine through headphones, and interact with various tactile elements such as plush arm sculptures, a furry telephone, and a sequined wall for creating their own artworks. The whimsical and interactive nature of the exhibition appeals to art enthusiasts of all ages (Mattina 2021).



Figure 3. Left: A visitor experiencing *Affirmation Tub* by Michelle Vine (Vine, Michelle. "Contemporary Artist." Michelle Vine. Accessed March 24, 2023. <https://michellevine.com/>.) Figure 4. Right: A participant experiencing *Embosom*

In *Affirmation Tub*, the focus on touch is all-encompassing, similar to *Embosom*, and they both feature an auditory component. Inspired by this piece, I also engage the senses and invite physical interaction with the artwork. In both cases, the installations invite the viewer to become an active participant in the experience, rather than a passive observer, and create a space for contemplation and reflection on complex issues such as mental health, intimacy, and human connection.

2.7. Research Questions

The following are the key research questions that guided my investigation into creating an immersive experience resembling the concept of home and the development of a "sense of home" within diasporic communities.

- What are the affordances of multisensory, VR sculpture installations in exploring the psychology of home and instilling a feeling of physical and emotional comfort?
- How can VR enrich the viewer's sensorial experience through a dual spatial environment; real and virtual?
- In what ways can sound and touch be used to enhance the viewer's phenomenological experience?

3. Methodologies

The methodology employed in this project draws on the principles of phenomenology and psychology of home that inform my creative process. These principles provide a framework for gaining an understanding of multi-sensory dual spatial experiences within the concept of home, while also acknowledging home's complex and multi-faceted nature. To accomplish the design and evaluation of such an experience, two research approaches were used: research creation and case study. Research creation involves the use of creative practice as a means of generating new knowledge and insights. Case study, on the other hand, is a method of in-depth investigation of a particular individual, group, organization, or phenomenon (Gibson and Bellamy 2011). Through the combination of these two research approaches, this project aims to offer an immersive multi-sensory experience and study how it affects participants in the context of home (particularly from the perspective of the diaspora).

3.1. Psychology of Home and Immigration

In this project, I recognize the importance of physical surroundings and comfort in defining home through both the physical and virtual aspects of *Embosom*. I initially started *Embosom* with the idea of designing an experience that represents a hug. I aimed to investigate how an experience resembling parental touch can improve mental health by instilling a sense of comfort and safety as well as causing hormonal changes that make us calmer (Potgieter, 2019). As my physical sculpture developed throughout the past year, it has come to represent more than just a hug - it is also a reflection of home and the comfort and safety that it provides. The concept of home is often associated with feelings of support, familiarity, safety, and trust, and these same qualities are embodied by *Embosom*.

The idea of a physical soft embrace represents the comfort and safety that we associate with home. A soft embrace can create a sense of intimacy and closeness, which in turn makes the installation more immersive. At the same time, I also recognize that the modern concept of home is more nuanced than just a physical location (Mallet 2004). As Mallet argues in "Understanding home: a critical review of the literature.", there is a progressive understanding that the concept of home can be abstract and based on emotional attachment and a sense of belonging (Mallet 2004). To depict this liquidity in Mallet's idea of home, *Embosom* features virtual visuals that constantly move and transform, representing the fluidity of the concept of home and the idea that our sense of home can be shaped by our experiences and emotions, rather than just physical surroundings. Overall, through both the physical sculpture and the transforming VR visuals, *Embosom* aims to be an immersive experience representing the multifaceted concept of home and provide a sense of comfort and safety that is relatable to visitors with different understandings of home specifically in a diasporic community.

In the context of diaspora, home is intertwined with other concepts such as affiliation, stability, nostalgia, and rejection. This dual ontology, in which the diasporic subject looks in two directions, towards a historical and cultural identity on one hand and the society of relocation on the other, is acknowledged in many texts on diaspora (Bhandari 2021). As a result, the concept of home becomes fragmented, and inspired by this idea, I designed a dual-spatial installation. Within this installation VR visuals that represent the deconstruction and reconstruction of home in a continuous cycle representing the present/past duality that is theme in diaspora's understanding of home.

I am using both visuals and sound inside a VR spatial environment in combination with sculptural elements to design an experience that encompasses the physical and emotional dimensions of home. The idea of the conjunction of two different spatial contexts is supported by the fact that in the psychology of diaspora, "home" is

often defined as a complex and multi-faceted concept that encompasses both tangible and intangible elements (Mandal 2021). Home includes physical elements such as a specific geographic location, artifacts, or a specific cultural context, as well as emotional and psychological elements such as a sense of belonging, safety, and security (Mandal 2021). Aside from safety, comfort, and trust, the concept of home for individuals in diaspora can also evoke a sense of loss and longing for the places and people they have left behind. It encompasses the emotional and psychological effects of displacement, including feelings of isolation, cultural disconnection, and identity confusion (Cobb et al. 2019). However, immigration can also bring hope and expectations of a brighter future (Cobb et al. 2019). The psychological concept of home in diaspora often involves a tension between the individual's current location and their sense of home, as well as a tension between hope and loss. However, art experiences that evoke positive emotions and memories of home can help alleviate these feelings and provide a sense of belonging.

3.2. Phenomenology of Virtual Reality

In a phenomenological context, the focus is on how users experience and interpret a phenomenon. By examining the user's subjective experiences of the virtual reality environment, researchers can gain a deeper understanding of how these technologies impact the effect of their work. As discussed in the literature review, "The Imaginary" explores perception, consciousness, and the imaginary (Sartre 2010). While this book does not specifically address virtual reality, its examination of the imaginary and how it relates to our consciousness can be extended to VR as well. As Sartre argues "[imagined objects] are diluted. These are not sensible but quasi-sensible" and "the feeble life that we breathe into them comes from us" (Sartre 2010, 125). His philosophy provides a useful framework for understanding the phenomenology of virtual reality. As he points out, the imaginary is both present and out of reach at the same time - just like virtual reality. He also notes that thinking in terms of space and in space is for the real world (Sartre 2010). He suggests that the imaginary is not bound to the laws of physics and does not require a spatial dimension in the same way that the real world does (Sartre 2010, 5). This inspired me to experiment with the spatial features in my VR sculpture installation and remove some elements, such as the background horizon, floor, and ceiling, to create a dreamier visual experience. Sartre posits that the imaginary is a vital aspect in the creation of art too, as it enables the artist to materialize their artistic vision and express their ideas to the audience (Sartre 2010). He also asserts that the viewer's engagement with the artwork is influenced by their own utilization of the imaginary, as they employ mental images and perceptions to comprehend the artwork. Phenomenologically, Sartre posits that art is a way to delve into and express the imaginary, and that the imaginary is a vital aspect of human engagement with art (Sartre 2010, 188-194).

According to Sartre, an image in the mind is not simply a sum of its individual parts, much like how imagination differs from perception. Based on this, in the virtual reality experience that I have designed, I have intentionally made the sound abstract and not necessarily matching the homey environment of the visuals. This choice is supported by Sartre's idea that mental imagination lacks individuation, and is perceived as a whole, rather than as individual parts (Sartre 2010). In this book, Sartre also explores mental image and the role of imagination in perception and thought, which has inspired me to place greater emphasis on the VR (resembling imaginary) component of the installation. As Sartre says "[and irreal object] is without attachments" it has a "shadow of time" and a "shadow of space" (Sartre 2010). The same qualities of VR can make it more abstract in its nature and a potential great medium to leave room for participant's interpretation.

As mentioned in the literature review, Bachelard's views on phenomenology inspired the VR experience in *Embosom* to focus on the subjective experience of space. Bachelard's writing focuses on how physical spaces can elicit emotional and imaginative responses in individuals, and how these responses are shaped by our embodied experiences of the world (Bachelard 2014). Inspired by his ideas, I explored the psychological and symbolic meanings of different elements of home and space by incorporating symbols of hope and change, such as windows

and doors, in my VR experience. By using these symbols, I aimed to create a more thought-provoking experience that allows participants to explore their emotions and engage with the installation on a deeper level.

3.3. Phenomenology of Touch and Sound

In this section, I will examine how the non-visual aspects of the installation, such as sound and touch, are analyzed through a phenomenological perspective. Phenomenology emphasizes the first-person experience of perception, and how our interactions and experiences shape our view of the world (Crowther 2009). By applying a phenomenological lens to the non-visual elements of the installation, I aim to explore how participants' perceptions and experiences are shaped by these sensory modalities.

In *Embosom*, sound is a crucial element that adds depth and richness to the overall experience of the work. It not only immerses the audience in the moment but also helps to evoke emotions and memories that are integral to the themes explored in the piece. The carefully crafted soundscape transports the audience to a different realm, inviting them to engage with the work. The intimacy of sound helps to evoke familiar memories and bring a sense of familiarity to the experience of being away from one's place of origin. I argue that one of the unique aspects of hearing is the lack of control we have over the stimuli. Unlike sight and touch, where we have more agency in choosing what we want to observe or feel, sound often surrounds us without our consent encouraging the participants to keep an open mind. Additionally, sound has a temporal aspect (Serres 2008) that differs from other senses, where a single moment in time may not convey the entirety of a message or melody. This is aimed to help encourage more engagement with the artwork and develop a mental connection to it over time.

Maurice Merleau-Ponty is known for his work on perception, embodiment, and language, including his theories on touch. Merleau-Ponty posited that touch constitutes a distinctive mode of perception, distinct from vision or hearing, due to its direct physical interaction with the environment (Moran 2010). By physically touching an object, we gain a close understanding of its texture, temperature, and other tangible characteristics. In my research, I integrated the element of touch to create a comfortable setting and to promote embodiment and memory recall. Another source of inspiration in using touch is Michelle Vines work (Vine 2023). In *Affirmation Tub* (see Figure 2.), the focus on touch is all-encompassing, similarly with *Embosom*, and they both feature an auditory component. In both cases, the installations invite the viewer to become an active participant in the experience, rather than a passive observer, and aim to create a space for contemplation and reflection on complex issues.

3.4. Ethical Considerations

Research involving human participants has the potential to significantly advance our understanding of various phenomena and benefit society as a whole. However, it is crucial to ensure that such research is conducted in a manner that prioritizes the protection and respect of research participants. This includes adhering to ethical guidelines provided by the government of Canada (Canada. Ministry of Health 2023) including obtaining informed consent and minimizing any potential risks to participants. As part of my research, a rigorous ethics approval process was undertaken, which resulted in the Research Ethics Board (REB) of Canada granting approval for my case study. To ensure the safety of all the participants, a consent form was developed and implemented, which outlines the risks and benefits of the study in detail. The primary objective of the consent form is to ensure that eligible volunteers are selected and that participants in the case study have a clear understanding of the study's objectives, procedures, and risks. This process is critical to maintaining the ethical standards of the research and ensuring that participants are fully informed and have given their informed consent to participate.

Apart from the ethics approval and consent form details, there are other points regarding inclusivity that I want to note in this section. Firstly, analyzing both psychological and poetic aspects of home can lead to recreating the positive aspects of the human-home bond to improve one's quality of life. However, it is important to acknowledge that the concept of home also has a darker side (Ahmed 2020). For some, a family home or home country can become a site of trauma. This research focuses on the supportive and comforting aspects of home, but it does not deny or overlook any negative experiences associated with the concept of home (Ahmed 2020).

Finally, it is important to note that the discussion of sound in the context of installation art should also consider the perspective of deaf culture (Sparrow 2005). While hearing provides individuals with information and understanding of the world, it is important to recognize that the absence of hearing should not be viewed as a deficiency. The field of critical disability studies (Waldschmidt 2018) highlights that deafness should be considered as a culture rather than a disability, as the deaf community often identifies themselves as such and has their own language, customs, and institutions. It is essential to acknowledge and respect the unique perspectives and experiences of the deaf community in discussions of sound and installation art.

4. Research Methods

This chapter presents the research methods employed in the exploration of the concepts of home, immigration, and associated emotions among individuals of diaspora. I discuss the research approaches used in my study, which integrates both a case study interview questionnaire supported by a survey that informs on participants' emotional feedback and a research-creation project as data collection methods. By combining these two approaches, I aim to provide a comprehensive and multi-faceted exploration of the home and immigration phenomenon as experienced by a diaspora community.

4.1. Case Study

Self-reflection and peer feedback have been critical components of the prototyping and design process for this project. In addition to these, participant feedback in the form of case study interview questionnaire is also a valuable source of information that aims to provide answers to my research questions. As Sartre says, in speaking our thoughts, we get to know them better, and language returns them to us better defined (Sartre 2010, 84). Therefore, by asking participants questions about how participants experience the artwork, they can better form their thoughts around it. With this information, I can also gain a deeper understanding of how this installation is received, rather than solely relying on observations of users experiencing it. A case study involves in-depth examination of an individual's experience, behavior, and emotions (6. and Bellamy 2011). Below are the details of my case study that was conducted on twelve participants.

4.1.1. Participant Demographics

To investigate the idea of home among diaspora, I have decided to focus specifically on members of the East Asian and Middle Eastern diasporas. By narrowing down the target population, I aim to assess the effectiveness of my research in exploring the concept of home and the associated emotions within the diaspora community. To ensure homogeneity in the target population, I have chosen to focus on East Asian and Middle Eastern immigrants, as my preliminary interviews have revealed that they share similar experiences and perspectives on home and immigration with me. To define an age group, due to ethical and safety considerations (Canada. Ministry of Health 2023), and the structure of the physical sculpture, the age group of participants was limited to adults between 18 and 55 years old. Additionally, as the study involved a virtual reality component, it excluded pregnant individuals and those with certain health conditions, such as epilepsy and binocular issues, or current eye infections ("Health & Safety." ClassVR 2022).

4.1.2. Limitations

When conducting research with a limited number of participants, there will be less possibility for diversity and inclusion in the participants demographics. This leads to the results not being generalizable to a larger population. The small sample size can lead to the possibility of a biased sample, where the participants may not be representative of the bigger population. Additionally, if the participants are not diverse in terms of demographics or other relevant characteristics, it can be difficult to understand how the findings may apply to other groups or to perform cross comparison. Therefore, in my research with a sample size of twelve participants, it is important to

consider the limitations that the small sample size and lack of diversity may have on the generalizability of the results.

4.1.3. Participants' Journey

The use of human participants is essential to this research that investigates the concept of feeling at home and how the viewers experience emotions through a multisensory virtual reality installation. The target audience includes adults who identify as being part of a diaspora. I measured emotions felt by a group of twelve adult immigrants while experiencing the VR installation. By using a case study interview questionnaire supported by a survey on emotional response, I was able to measure their emotional state and thoughts both before and after their interaction with the installation, I collected data that informed the research outcomes. The data was collected through both an interview and a survey questionnaire.

4.1.4. Interview Questionnaires

I used interview questions to get detailed information from participants, such as personal narratives and thoughts. This helps me understand their experience better and answer research questions. Interviews are more open than surveys and can provide ideas on how to improve the artwork to meet research goals. In my study, interviews worked better than surveys in learning about the impact of the artwork on participants. From the interview questionnaire responses, I was able to assess the effect of specific elements of the installation, namely VR visuals, sound and touch, on the viewers. And therefore, found common themes in participants' responses that helped answer my research questions. [The interview questionnaire](#) used in this study is included in appendix 9.2.

4.1.5. Survey

Surveys in art-based research can inform the researcher about the audience's perception and interpretation of the artwork, and how it affects their emotions and thoughts. By comparing participants' reported ratings for ten different emotions both before and after the experience valuable feedback on the effectiveness of the artwork in being an immersive installation evoking comfort and a sense of home. I also use demographic information as a way to understand the participants' background and how it may influence their reaction to the artwork. Due to the small number of participants, the survey results could not be generalized but they still provided tangible data on participants' experiences. They highlighted common reactions as well as the unique responses of individuals. It is important to note that while the results may not be representative of the larger population, they are still significant in understanding the experiences and perspectives of the participants involved in the study (Watson et al. 1988). [The survey](#) used in this study is included in appendix 9.3.

4.2. Research Creation

Research creation, also known as practice-based research, combines traditional research methods with the creation of art. This means that the researcher to not only study the art form, but also to actively participate in it, creating new works while conducting research (Manning 2016). The researcher gains insights and understanding through the creative process itself, as well as through the analysis of the finished artwork.

Research creation in the context of visual art refers to the process of creating art for the purpose of generating new knowledge and understanding. This can take the form of creating art specifically for research purposes or using the process of art creation as a means of conducting research (Manning 2016). In *Embosom*, the artwork was created with the intent of producing new research findings, but the process of creating the piece also resulted in additional insights that can be considered a distinct body of information (Manning 2016). The project incorporates a range of innovative techniques, including prototyping, sound design, and haptics, to capture the multidimensional nature of the experiences of diaspora. In the following section, I will delve into the specific details of each of these research methods, their unique contributions to the project, and the challenges encountered during their implementation. I also discuss the ways in which these methods were integrated and complemented to each other to provide a comprehensive understanding of the research topic.

4.2.1. Design Iterations and Prototyping

Prototyping is an important part of my process, as it allows me to test and refine my ideas before creating the last version of the piece.

4.2.1.1. Prototypes of the VR background

I began experimenting with the VR component using Google cardboard goggles as a more accessible and affordable option. I tested various genres of VR videos, including nature, space, and abstract visuals, to determine which ones were most suitable for this project. To present diverse perceptions of home, I opted for more abstract visuals.

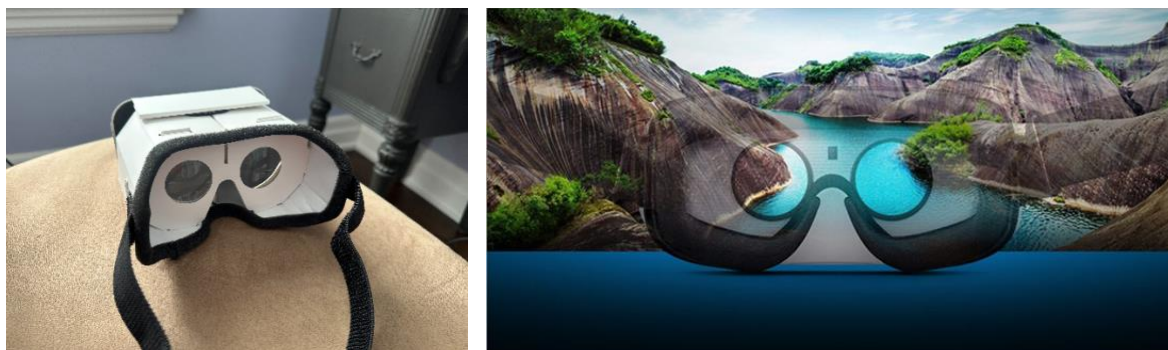


Figure 5. Left: I assembled the Google Cardboard for preliminary exploration of 360-degree YouTube videos Figure 6. Right: An example of immersive virtual reality experience with Cardboard and the YouTube mobile app (“7 Best VR Videos: Best 360 Virtual Reality Videos to Watch [2023 List].” [https://www.softwaretestinghelp.com/best-vr-videos-review/.](https://www.softwaretestinghelp.com/best-vr-videos-review/))

As the previous goggles were not providing satisfactory visual quality, I switched to Meta's Oculus II goggles to recreate the abstract visuals I had envisioned. Exploring existing applications and visuals I narrowed my design down to slow moving graphics with a dark background. I began by creating a loop of motion graphics, utilizing a combination of different particles and movements to depict the complex concept of home. To symbolize the concept of home as unity and wholeness, I began by using a sphere as a foundational element. I then created particles with a smoky quality that would come together and shape the sphere, representing the many complex factors that contribute to one's sense of home. As the sphere begins to disintegrate, this visual representation showcases the unsettling feeling that can arise when leaving a home behind. However, right after the disintegration, a new cycle begins shaping the next sphere. The loop represents hope and the possibility of renewal in the creation of a new home.

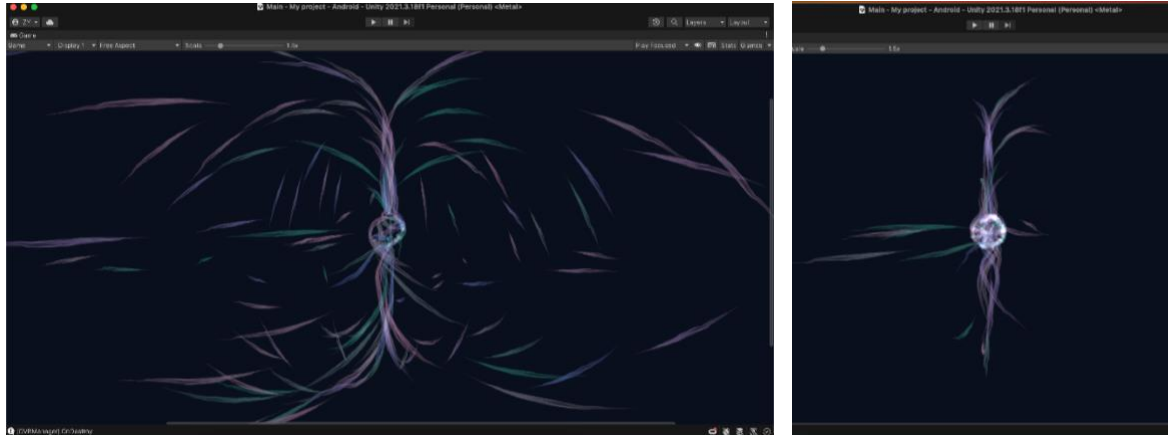


Figure 7. Left: Screenshot of VR prototype created in Unity (game engine) - Particles gathering in the center of virtual space
 Figure 8. Right: Screenshot of VR prototype created in Unity (game engine) - Particles shaping a sphere representing home

Through peer feedback and self-reflection, ultimately, I settled on a design for an abstract room, where the elements both construct and deconstruct in a dynamic and ever-changing manner. Through this design, I am still able to effectively convey the abstract themes of the project and engage viewers in a captivating way, while taking steps to convey the concept of home in a manner that is universally relatable. The motion graphic portrays a room with four walls and windows/doors, which represents a sample of a home. The home is a constellation of sparkling particles that represent the physical objects and experiences that fill it. The particles, moving and swirling, follow the path of immigrants' journey through space, showing how home is always changing, always moving. They embody who we are, reminding us that homes are part of us, like particles are part of our being. Through this choice of material, I show that home is not just a place, but something we always carry with us, wherever we go.

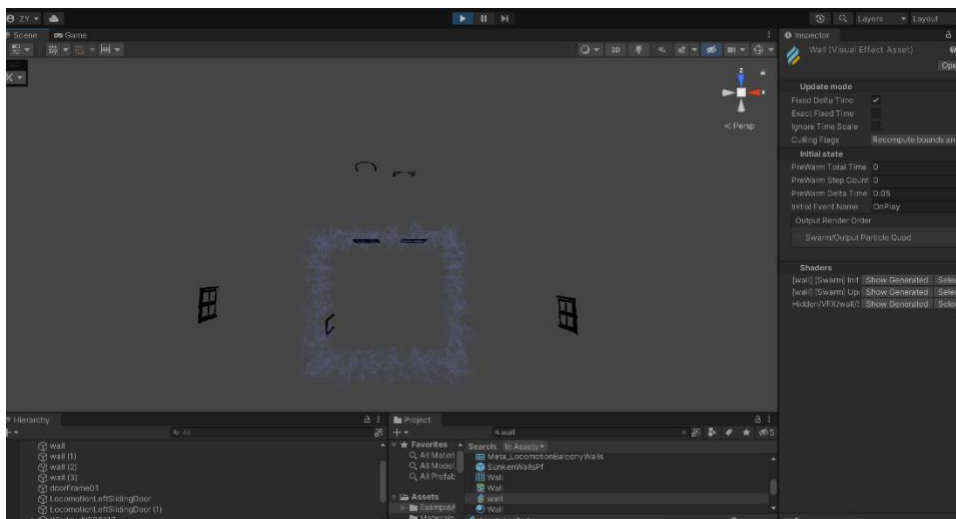


Figure 9. Screenshot of the final VR visuals created in Unity (game engine) - Top view of the room walls, alternating windows, and doors.

The tint of particles starts with cream-colored, which is a common interior color in many homes and prevalent exterior color in most middle eastern homes, hence reminding the target audience of their childhood experience. The color then evolves to light and dark blue to mimic the immigration paths through air and sea. In this way these colors also represent the familiar and the unfamiliar. Cream-colored represents the comfort of the known, while light/dark blue symbolizes the uncertainty and challenges that come with the unknown. This juxtaposition of colors

reflects the bittersweet nature of immigration and how it involves leaving behind what is familiar while embracing the new possibilities.



Figure 10. Screenshot of the final VR visuals created in Unity (game engine) - Constructed room with little particle movement.

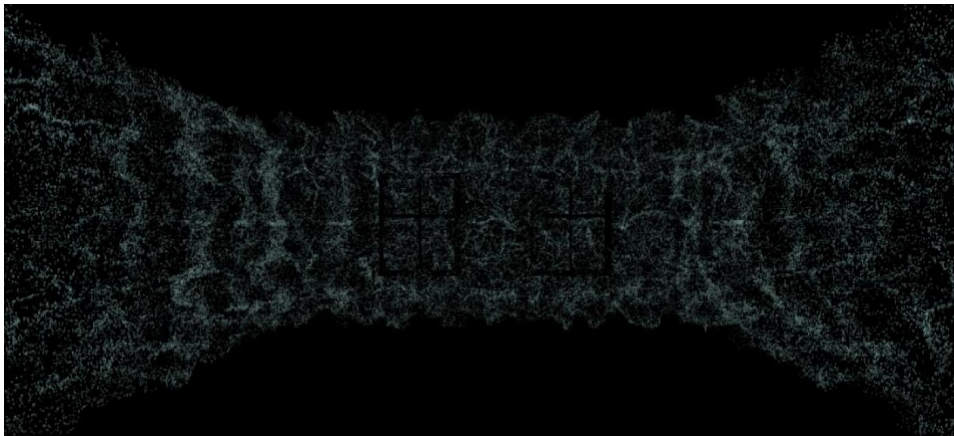


Figure 11. Screenshot of the final VR visuals created in Unity (game engine) - Particles moving in with a Perlin noise pattern.



Figure 12. Screenshot of the final VR visuals created in Unity (game engine) - Particles moving towards bottom with simulated gravity force.

As this work deals with conflicting themes (past vs. present) and contradictions (hope vs. loss), I express similar contradictions through the construction and deconstruction of the walls in the VR visuals. In the VR experience, the windows are a metaphor for thinking of immigration. They trigger as a perspective as viewers of the world spectating new sights and experiences. They also represent the possibilities and opportunities that await us outside the comfort-zone of our homes and the hopes that immigrants carry.

Meanwhile, the door in the visual serves a dual purpose, symbolizing both our entry into new spaces and situations, and our departure from old ones. They remind us that every time we step through a doorway, we are leaving something behind and starting a new journey. The doors also represent the challenges and obstacles that we may encounter on our path to finding a new home, in terms of the doors we must open/close both physically and emotionally.

In the VR experience, the viewer is positioned at the middle-back area of the room to create a sense of enclosure and support while taking on the role of an audience of their own lives (or the lives of other immigrants). The VR experience builds and disintegrates multiple homes to show how immigration is a process of leaving one home but also creating a new one at the same time, and how the concept of home is ever-changing and dynamic.

4.2.2. Prototypes of the Physical Sculpture

The images presented in this chapter are arranged in a chronological order, showcasing the progression from initial drawings to 3D designs, and finally to physical prototypes. This progression illustrates the process of designing the final art installation and experimentation throughout the building of the final piece. The initial inspiration for my sculpture was born out of my personal experience with anxiety, which I had been grappling with for several years. During the summer of 2019, I began to reflect on how social touch and hugs from friends had helped me manage my anxiety. As I delved deeper, I realized that my desire for physical touch stemmed from my childhood experiences. Coming from a middle eastern culture where parent-child physical contact was not as valued, I recognized the emotional toll this lack of touch had taken on me. This realization became the driving force behind my sculpture, as I aimed to create a piece that would raise awareness of the importance of touch. Considering the pandemic, the need for social touch became even more pressing, and I wanted to create an alternative for individuals who were lacking this vital human connection. Throughout the prototyping phase, I focused on creating a life-sized sculpture that would emulate the comfort and support of a parental hug. As the sculpture developed, the concept evolved to reflect the theme of displacement and the emotional toll of lost physical touch in diaspora.

The visual attributes embedded in the VR sculpture installation came from drawings of the comforting hugs that most humans experience as babies. While the hug itself is usually stationary, it has a significant impact on the human mind by increasing oxytocin levels. To represent this internal dynamic factor of touch in a visual form, I utilized line drawings and organic shapes to create a calming and inviting aesthetic. I gave the piece the working title of "The Second Chance," referencing the potential for it to transport individuals back to the worry-free period of their infancy, where they could experience supportive and comforting hugs.

4.2.2.1. *3D object prototype*

To better visualize the 3D version of the drawing, I created my first prototype using construction foam. This prototype allowed me to see how the sharp turns at the elbow area looked harsh in 3D and helped me to consider the interactivity of the piece. I envisioned the beholder laying on the sculpture's arms and began to consider ways for individuals to get on and off the sculpture. For the next phase of prototyping, I created a 3D model of the hug sculpture. This allowed me to experiment with the curves of the design and create a digital rendering of a participant inside the sculpture to estimate its real-life size.



Figure 13. First 3D design for *Embosom* – Physical sculpture recreating parental hug.

The 3D model of the hugging sculpture was initially created to closely resemble a human body and appear realistic. However, in 2022, there was a shift in the concept, which led to a change in the visual representation of the piece. Joining the DF program and taking an Autoethnography course helped me to realize that my sense of disconnection was not just a childhood issue but a continuous one. It became clear to me that my immigration experience had triggered my anxiety, which in turn, made me realize that I was missing more than just social and familial touch. I was also missing the entire ecosystem that my childhood home and country had provided me with. This realization coincided with the social change events that began in September 2022, which focused my attention even more on my home country. At this point, I shifted the focus of my concept towards creating a sense of home for people in diaspora. While this concept still relates to the loss of social touch for new immigrants, I wanted the sculpture to be more abstract and to focus on creating a tactile experience that evokes a sense of home. Therefore, the sculpture underwent a second round of digital and physical prototyping.

Throughout the creative process of developing the physical sculpture, I found that both 3D and physical models were valuable in their own ways. With 3D modeling, I had the freedom to play with different sizes and incorporate human models to visualize life-size interactions. However, digital models lack the element of randomness and chance that often leads to new and unexpected ideas. In contrast, working with physical materials such as clay allowed for surprises and accidents to occur, leading to slight redirections in the intended process.

While working with clay, I was able to start with an abstract shape and gradually bring out the body parts that I wanted to highlight. However, as I worked, I found that I had less clay than I needed, which caused me to eliminate the legs from the shape. This decision gave the sculpture a more grounded, less human-like appearance and increased its level of abstraction. By toggling between 3D and physical models, I was able to take advantage of each medium's unique properties to develop my concept and refine the design of the sculpture.

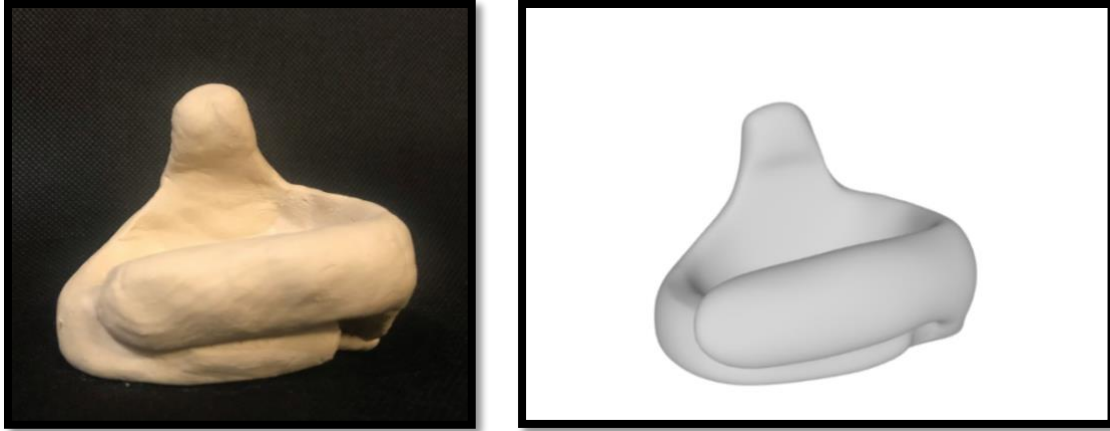


Figure 14. Left: Clay prototype – Moving towards a more abstract shape for the hug, Figure 15. Right: 3D model – Moving towards a more abstract shape for the hug

Once the physical model was complete, I digitized it and moved the 3D digital object to the virtual spatial context in order to create a more immersive experience of the digital prototype using VR technology. This allowed me to test out the ideal size and curves of the sculpture without the limitations of physical space. With the help of Oculus goggles, my supervisors provided feedback on the size of the head, the curves inside the sitting area, and the overall dimensions of the piece, which I used to create a more refined 3D model with exact sizes. The VR prototype also inspired the addition of a VR aspect to the physical sculpture, which was a significant development in the project. I will discuss the creation process of the VR aspect in the following section.

4.2.2.2. *Scaling prototype*

The final 3D process in building my physical sculpture was to slice the modified, life-sized model. Slicing involves preparing the model for CNC milling on foam or wood sheets. Each slice is carved out of a single sheet of material, and then the slices are reattached using adhesive or other forms of attachment. Preparing the files for the machine involved many technical considerations, such as material choice, optimizing the use of sheets, and determining the appropriate curves, space between pieces, and type of 3D file. However, due to unpredictable costs introduced by the Rapid Prototyping studio, the CNC milling phase did not result in machine-carved layers.

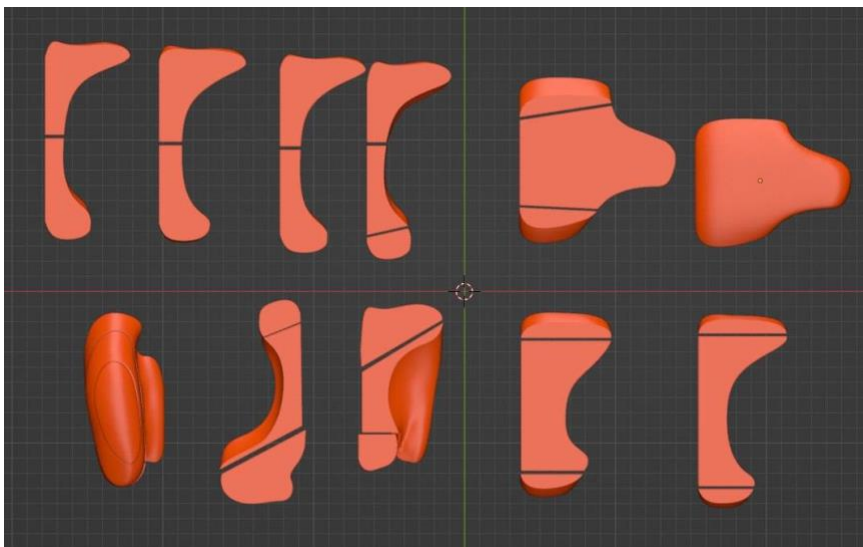


Figure 16. Digitally sliced 3D model ready to be transferred to foam sheets and cut.

4.2.2.3. Mapping process and hotwire cutting

After conducting some research on foam carving and consulting with my supervisors and prototyping staff, I decided to use a hotwire cutter to carve out the pieces of my sculpture from foam sheets. The layering technique was useful when I started to use the hot wire to carve out the pieces on the foam sheets.



Figure 17. Left: Sliced 3D model projected on foam sheets, Figure 18. Right: Hotwire cutting of the slices out of foam sheets

Next, I used foam-friendly glue to attach the layers and make the final foam prototype:



Figure 19. Left: Sliced 3D model projected on foam sheets, Figure 20. Right: Attached the pieces together to form the hug

During the process of creating the foam sculpture, the question of material choice for the final sculpture arose. Peer feedback and journal entries pointed me towards using a more soft, homey, and personal material than foam, plastic, or wood.

4.2.2.4. Sewing

Sewing, because of the intimate nature of choosing, touching, and attaching fabric, is inherently more personal than CNC-milled hard material. The choice to go with a softer surface was made for comfort, aesthetic, and conceptual closeness to the sense of home. To try out the soft sculpture, I started by sewing cushions and attaching them in a form similar to the 3D designs I had but at a smaller scale.



Figure 21. Left: Sewing cushions out of used clothes, Figure 22. Right: Attached the cushions together to form the hug

Upon trying out the soft form, I was convinced to keep the soft surface. However, there were still questions regarding the form and the possibility of scaling the prototype to a size where people could recline on it comfortably and safely. To address this, I decided to use the foam sculpture as a base for my cushions, which would help with the sturdiness and give me a starting point to place the cushions. I also shifted from a stack of cushions to a quilt idea, which would provide more control over the composition and a flatter surface that would be more comfortable. To determine the color palette, I researched various quilts and home interiors. Then, I sewed the fabrics into cushioned, quilted parts that would come together to shape a home with cushions resembling furniture and objects commonly found in a home.



Figure 23. Cushion design ideas that represent different components of a typical home, Figure 24. Middle: Attached the pieces together on top of the foam model, Figure 25. Right: Participant laying down in the model and watching VR visuals in a dual-spatial setting

The above prototype (see Figure 25.) was displayed as part of a first install and peer-feedback that I received was that the Styrofoam is not comfortable enough and a beanbag might be a better option for the hug. Based on the peer-feedback received, I decided to use a softer color palette with more textured fabrics for the quilted cushions. To improve comfort, I added bean bag filling to the foam structure and hand-sewed the fabric pieces together on the foam model to ensure that the final shape would resemble the 3D model.



Figure 26. Sewing a hug shaped beanbag from scratch, Figure 27. Middle: Filled beanbag, Figure 28. Right: Participant laying down in the model and watching VR visuals in an immersive dual-spatial setting

Going with the beanbag idea allowed for flexibility in the top arm, enabling users to move it around and adjust it for extra comfort. The final piece added to the physical installation are two windows. These helped contain the work and define a home-like space around it. The windows are also a reference to the ones used in the VR visuals and to make the physical and VR worlds more coherent. In Crowther’s book titled “Phenomenology of the Visual Arts (even the frame)” (2009), the author argues that art is not just about visual explorations, but it is also an embodied and subjective experience. The book also examines the role of the frame in shaping our perception of art. Crowther argues that the frame is not just a decorative element, but it is also an integral part of the artwork that influences our experience and interpretation of it. This book provides a thought-provoking analysis of the relationship between art and human experience (Crowther 2009).

4.3. Sound Design

To create the sound piece in my installation, I collaborated with Evan Prosser, an OCADU alumnus with expertise in audio production. Evan and I held brainstorming sessions where I shared my inspiration pieces and Evan took charge of the technical work of mixing them and adding his own touch. The sound composition is an integral component of the multisensory experience and plays a significant role in evoking feelings of home and positivity. By using carefully crafted soundscapes, we aimed to create a warm, comforting, and uplifting atmosphere that leaves viewers immersed in the experience with a sense of calm and wonder. Evan further explains the design process: “the whole piece is about 30 minutes with 7 different components slowly intertwining, slowly fading in and out. (Grass-blowing/forest field recording, waterfall field recording, and a mix of piano, synths, bowed strings, and effects to create some atmosphere/composition).” The sound piece is delivered to participants through headphones. The use of headphones in *Embosom* is a deliberate choice to enhance the immersive experience and transport the participant to the virtual world. By blocking out external noises and distractions, the headphones create a more intimate and focused environment, allowing the participant to fully engage with the work. Furthermore, the headphones physically help the participant to feel more detached from their current surroundings, making it easier for them to suspend their disbelief and fully immerse themselves in the virtual world. This, in turn, enables the participant to connect more deeply with the themes and emotions explored in the work, encouraging them to reflect on their own experiences and personal connections to the piece.

4.4. Haptics

The sense of touch is an important sensory modality and can be used as a means of investigating and generating new knowledge about a variety of phenomena including home and immigration. I use textured fabrics and the hugging form of the physical sculpture to improve the effectiveness of my VR visuals by making the experience more immersive. Touch is widely acknowledged as an essential sense because it is the first sense to develop in the womb and it plays a crucial role in human development and social interaction (Potgieter 2019). The tactile engagement is an important aspect of the installation because it serves to deepen the viewers' emotional connection to the work.

The physical sculpture of *Embosom* is a soft, abstract, human-like figure created through the process of hand-sewing and attaching fabrics filled with soft fillings. Participants have the option to either recline or sit inside the sculpture prior to being provided with the VR equipment. By using a combination of fabrics, I aim to create a range of textured fabrics that are both inviting and intriguing to touch. Each fabric is carefully selected for its unique properties, with some being soft and fluffy while others are rough and scratchy. These varying textured fabrics create a diverse sensory experience that encourages visitors to explore the installation with their sense of touch.

Furthermore, the act of physically interacting with the installation can evoke a range of emotions and memories within viewers. For instance, the softness of the fabrics can evoke feelings of comfort and familiarity, reminding viewers of the softness of a childhood teddy bear or the warm embrace of a loved one. Similarly, rougher fabrics might remind viewers of a wool scarf. By incorporating different textured fabrics into the installation, I hope to create a sensory experience that is both playful and thought-provoking. Touching the fabrics in another way of interaction with the work, to connect with the emotions it evokes and to explore the concept of home and immigration through a physical and tactile lens.

5. Research Outcomes

The results of this study are presented in this chapter, including the methods used for data gathering and analysis. I collected data through surveys and interviews with participants and analyzed using qualitative techniques. The participants first complete the initial interview questions, then rate their emotions on a scale of 0 to 10 before the experience. Following the experience, they are given a new set of interview questions and asked to rate their emotions once more. The findings of this study provide insights about the participant's experiences and perceptions of the immersive VR sculpture installation, as well as the effectiveness of the installation in evoking feelings of home for those in diaspora. The results also highlight any limitations or issues that arose during the research process and how they were addressed.

5.1. Data Management and Analysis

The data I have worked with in this research comes from two sources: An emotion rating survey and an interview questionnaire. For the emotion survey I used repeated measures both before and after the experience to compare how participants were emotionally affected by the VR installation. The survey provides emotion scores that can be aggregated and get a sense of how emotions changed in participants before and after the experience. The interview questionnaire permits more detailed and nuanced responses regarding the specific factors that influenced participants' emotions, and also captures additional thoughts and feedback.

5.1.1. Interview Questionnaire

The Interview questionnaire gathers demographic data and provides a bit of background information about the installation before it is experienced. The questionnaire gathers data on participants' thoughts on home/immigration and the VR installation. There are 4 questions to be answered before the experience and 6 questions after the experience is completed. The details of [the interview questionnaire](#) are provided in the appendix 9.2.

Here are some patterns and themes I observed in participants responses to each question:

1. Q1(Before) - What does "feeling homey" mean to you?

"Comfort" was the most frequently cited response to the question, mentioned by half of the twelve participants who were surveyed. Four participants identified "food" and "culture" as key elements that made a place feel like home to them, while two participants valued being around loved ones above all else. Other participants associated home with feelings of peace, warmth, cleanliness, coziness, and trust.

2. Q2 (Before) - Do your feelings towards your current home environment affect your day-to-day mental and physical well-being?

In 11 out of 12 cases, participants stated that their home environment had a significant impact on their well-being. They reported that being in their primary residence allowed them to follow established routines and maintain

healthy habits, whereas it was more difficult to do so in new places. This finding suggests that new immigrants may benefit from building and maintaining healthy habits as a way to adjust to their new environment.

3. Q3 (Before) - Have your thoughts on immigration changed during your journey? How?

This question received one of the least explanatory answers, possibly due to the complexity of reflecting on the past few years and following the train of thought and events. Seven participants expressed surprise at the difficulties they encountered during the immigration process, despite expecting it to be easier or better in some way. One participant mentioned that they did not anticipate how challenging it would be to find friends from other nationalities. Three participants reported feeling that immigration was better than they had expected, and they felt better about their decision to immigrate when reflecting on their situation compared to what they could have experienced if they had stayed in their country of origin. The remaining participants either stated that their experience was the same as they expected or that their thoughts on the matter were frequently changing.

4. Q4 (Before) - Do you sometimes feel nostalgic about your home country? If so, how often do you think about that?

Only one person answered "no" to this question. The other participants' responses varied from remembering home after reading news daily to occasionally missing home during holidays. The most frequent response was that reading news and special events evoked nostalgia more than anything else. This finding highlights the strong emotional connection that members of the diaspora often maintain with their home country.

5. Q1 (After) - What emotions and insights did you experience in your interaction with the VR sculpture installation?

The most common responses to this question were feelings of calmness, comfort, and relaxation. Three out of twelve participants mentioned that they felt a sense of connection with the universe and felt as though they were part of something greater. Two participants reported feeling very sleepy while experiencing the VR visuals, which is expected given that people often feel relaxed during calming virtual reality experiences. However, this finding suggests the potential to improve the design of future VR versions to add surprise effects that reduce the sleep-inducing effect. Three participants also reported remembering memories of their childhood or previous homes while experiencing the VR sculpture installation.

6. Q2 (After) - Which sensations were dominant in your interaction, and what elements of the artwork triggered those feelings?

The dominant feeling reported by participants was triggered by the visuals, likely due to the immersive nature of VR technology. Participants were particularly interested in the particles and their movements, with some noting the particles falling in front of their face. Many associated the VR experience with a sense of calmness. Three participants specifically mentioned that they enjoyed the windows in the VR environment, either because it reminded them of their childhood room or because they felt as though they were looking out a window. The next most mentioned sense was sound, with nine participants noting its importance to their overall experience. Three participants felt that sound was critical to how they felt and viewed it as a crucial complementary piece to the VR experience. Two participants mentioned that touch and feeling of being hugged was somewhat dominant and made them feel comfortable and at home.

7. Q3 (After) - Did this experience bring any specific memories of home back to you?

Ten participants answered "yes" to this question, while two mentioned that they did not experience any memories while using the VR sculpture installation. Among those who did experience memories, most mentioned memories of their childhood home. Others reported memories of natural phenomena such as stars, snowy days, sunny days, or nature in general.

8. Q4 (After) - How did the physical sculpture affect your perception of the virtual reality visuals?

Most participants mentioned that the physical sculpture complemented the VR visuals in a positive way. Only one person said that the physical sculpture was not helpful and that it should have been interactive. Among the other 11 participants who favored the existence of the physical sculpture, almost half said that it helped them to immerse themselves in the VR world and gave them a sense of comfort and homeliness. One person said that the physical sculpture reminded them of their bedroom couch, and two others said that it made them feel hugged. One participant stated, "the physical sculpture helped me to not feel my body because it was soft and made the visuals feel like an out-of-body experience."

9. Q5 (After) - Did the sound of the installation make your experience more immersive? In what ways?

All participants mentioned that they felt more in the zone because of the music. One person said that although they liked the music and found it soothing, they did not like the breathing sound because it reminded them of their body in the physical world and did not allow them to fully loose themselves in the visuals. However, another participant had almost the opposite take on it, saying that the music helped them to escape from the physical world. Most participants mentioned that the sound was an additional calming factor, and two mentioned that it helped them to feel a cosmic connection with the world. In one case, a participant mentioned that the VR visuals were unsettling at times, and the breathing sound was helpful in countering that effect. All in all, the music proved to be a crucial element in instilling calm and homey feelings in all participants.

10. Q6 (After) - Did any of the technical gear of the VR sculpture installation (e.g., warmth, goggles, etc.) trigger any discomfort or distract you from fully immersing yourself in the interaction?

Most participants responded no to this question. However, two participants mentioned that they found the goggles to be heavy and intrusive to their experience. This highlights the importance of ensuring that technical gear used in VR installations is comfortable and unobtrusive to allow for a fully immersive experience.

5.1.2. Survey

For the survey I used a slightly modified version of the Positive and Negative Affect Schedule (PANAS) which is a widely used psychological assessment tool that measures an individual's experience of positive and negative affect (Watson et al. 1988). The PANAS uses two 10-item mood scales for positive and negative emotions. For this research I am using 5 positive and 5 negative ones to keep the survey shorter and more focused on the senses this research is targeting. The details of [the survey](#) are provided in the appendix 9.3. With a total of 12 participants in this research I only rely on qualitative data driven from emotional ratings. The process I went through to turn this quantitative data into qualitative data is as follows:

- A) First, I identified the variables used to collect data in the survey. For example, each of the feelings ratings as well as the changes to the levels of those feelings.

Emotion rating change	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6	Participant 7	Participant 8	Participant 9	Participant 10	Participant 11	Participant 12
Happiness	2	1	2	3	2	0	3	3	1	3	-1	6
Optimism/Positivity	0	0	2	2	2	0	3	4	1	1	-1	0
Calm	2	1	3	3	2	2	2	5	2	6	1	5
Sensuality	3	0	4	3	2	-2	0	5	2	0	-1	0
Awareness	0	1	2	2	1	-4	2	5	1	-8	-1	0
Insecurity	0	0	-2	-3	-2	-1	-3	-8	-2	-1	3	0
Fear	0	1	-2	-1	-2	-3	0	-8	-3	-1	-1	0
Irritability	0	0	-3	-1	0	-1	-2	-8	0	0	0	-2
Anger	0	-1	-2	-1	0	-1	0	-4	-3	0	0	0
Nervousness	0	0	-2	-1	0	-3	-1	-8	-2	-1	1	-1

Figure 29. Difference in the emotion scores (the reported score after the experience is subtracted by the base score given before the experience)

B) I aggregated the data based on age group, gender, and type of feeling.

(1) Average of changes in emotion ratings among all participants

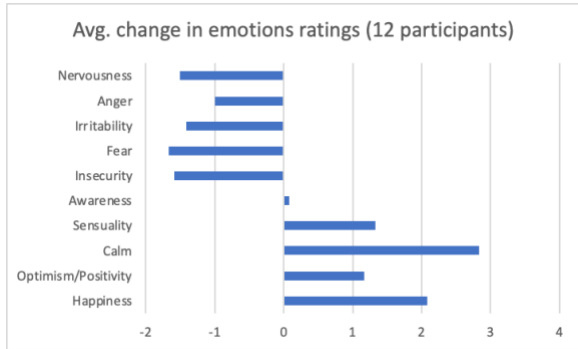


Figure 30. Average change in emotion scores for all participants

(2) Average change F vs M

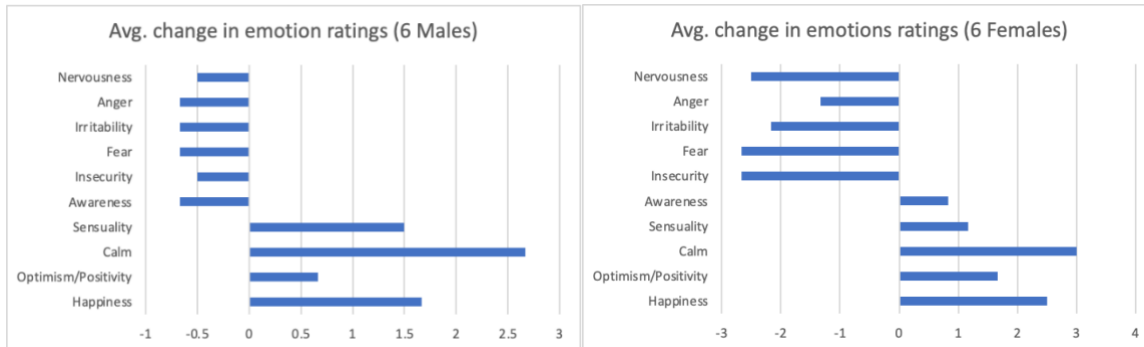


Figure 31. Left: Average change in emotion scores for male-identifying participants, Figure 32. Right: Average change in emotion scores for female-identifying participants

(3) Average change among age groups

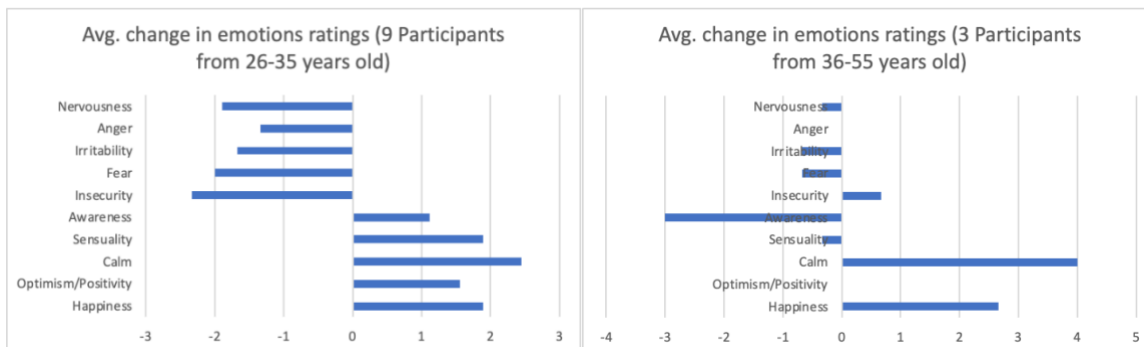


Figure 33. Left: Average change in emotion scores for participants that are aged between 26 and 35 years old, Figure 34. Right: Average change in emotion scores for participants that are aged between 36 and 55 years old

- C) I identified the following patterns in the emotion ratings both in general and per group:
- (1) Calmness was the emotion that showed the most improvement across all age groups and genders.
 - (2) The male participants showed less change in their negative feelings compared to the females, partly because their starting ratings for negative feelings were already low or zero.
 - (3) The results cannot be generalized due to the small sample size (three participants) in the older age group, but the 36-55 years age group showed less improvement in their negative feelings compared to the younger age group.
 - (4) The results on "awareness" were inconclusive as the VR's immersive quality had varying effects on participants' senses without any clear pattern.
 - (5) Fear was the emotion that showed the most reduction, which aligns with the expectation that the VR visuals would reduce fears surrounding immigration.
 - (6) Optimism was one of the positive feelings that showed smaller improvement compared to calmness and happiness, possibly because it is a more long-term feeling that is not easily influenced by a single experience.

By finding these patterns identifying changes to emotion scores, I created a more nuanced understanding of the survey results and gained valuable insights into the attitudes and behaviors of the people I surveyed. The variations in emotion ratings provided by the participants revealed a consistent trend towards increased positive emotions and reduced negative feelings. The interview questionnaire responses provided valuable insights into how specific components of the experience, such as VR visuals, sound, and touch, impacted user experience, as well as how these elements interacted with one another. Based on participant feedback, we discovered that the visual and sound elements were particularly influential and worked together synergistically to create a feeling of comfort and familiarity. Furthermore, the physical sculpture enhanced the overall sense of immersion and comfort during the experience.

5.2. Expectations and Discoveries

In this section, I present a summary of the results obtained from both the interview questionnaire and survey and indicate whether they aligned with or diverged from my initial expectations. Overall, the survey results showed an increase in positive feelings and a reduction in negative feelings, which was aligned with the goals of the project. However, the interview questionnaire revealed some unexpected findings. For example, question one showed that food plays a bigger role in feeling at home than was initially prioritized in the design. Nonetheless, calmness and comfort were also mentioned repeatedly, which were anticipated and designed for.

Most participants mentioned that their home environment plays a significant role in defining their habits and driving their daily lives. This finding was aligned with the expectation that the home environment affects mood and physical well-being. Although it was challenging to obtain a clear picture of how people's thoughts on immigration have changed over time, it appeared that for most people, there was some sort of change, either getting worse or better views on immigration and its effects on their lives. The change was mostly for the better, as they adapted to the unfamiliar environment.

The most dominant aspect of the experience based on user feedback was the use of particles in the VR visual which made participants feel fully immersed in the environment and created a sense of dynamism. Regarding the use of touch to evoke memories of childhood homes, there was only one mention of touch in remembering home. It turned out that the physical sculpture played a key part in getting participants comfortable enjoying the visuals and sound and further immersing the participants in the experience. In nine out of twelve cases the experience brought some kind of memories back to participants' minds. Most of those memories were from childhood homes and some of them of sunny or snowy days.

The physical sculpture played a crucial role in facilitating the participants' relaxation in a way that resembled their experience of being at home. During the observation of the participants, it was apparent that the structure of the sculpture provided them with enough freedom to sit or lay in various ways, allowing them to make themselves comfortable in a way that may not be possible on a regular chair or couch.

The physical sculpture served as an essential component in enabling the participants to experience the full calming effect of the VR visuals and sound. The structure of the sculpture helped the participants to relax and fully immerse themselves in the virtual environment, creating a sense of comfort and familiarity that resembles the feeling of being at home. This observation highlights the importance of considering the physical environment when designing immersive experiences. It demonstrates how the physical structure can enhance the participant's experience and help them to fully engage with the virtual environment.

5.3. Insights on Research Questions

The overall responses to my research questions based on interview questionnaire and survey are:

1. What are the affordances of multisensory, VR sculpture installations in exploring the psychology of home and instilling a feeling of physical and emotional comfort?

VR can create a sense of presence and immersion, allowing users to feel as though they are physically present in the installation. This can create a stronger emotional connection to the content and enhance the feeling of comfort. By combining different sensory inputs, the installation created a more comprehensive and engaging experience that stimulates different parts of the brain, leading to a stronger emotional response. User feedback suggests this multisensory VR sculpture installation successfully represented home by instilling a feeling of physical and emotional comfort. It also helped users develop a deeper understanding of the emotional aspect of immigration and home. However, the piece was more successful in instilling the feeling of home than provoking thoughts on immigration, as participant interviews showed.

2. How can VR enrich the viewer's sensorial experience through a dual spatial environment; real and virtual?

Based on participant feedback, it became clear that the VR visuals were the most dominant element of the immersive VR sculpture installation. The use of VR allowed the installation to create an immersive experience that transported viewers to a completely different environment. This, in turn, enabled the installation to evoke imagination and provide comfort to participants.

3. In what ways can sound and touch be used to enhance the viewer's phenomenological experience?

The rhythm of the VR visual (particles moving) was synchronized with the sound and all participants thought that the sound complemented the visuals in an enjoyable way. According to one participant, some aspects of the sound piece were intrusive to them out of the body experience. Overall, the sound piece made participants feel comfortable and homey.

The sculpture had a crucial role in making participants feel comfortable in the virtual environment. Its design allowed for different seating positions that could not be achieved on regular chairs or couches. Participants found the soft material comforting, with one describing it as a reminder of their old room and another feeling hugged by the universe. However, one participant felt the sculpture was unnecessary since there were no interactions between the VR world and the physical sculpture.

5.4. Significance and Implications

Embosom encourages participants' imagination and inspires them to perceive the concept of home in new and imaginative ways. The combination of VR visuals, sound, and touch, together with the comfort of the soft hugging sculpture, created a dual spatial installation that triggered participants' imagination and immersed them in a calming experience. The installation facilitates an experiential connection to the concept of home for participants. With the rise of globalization, individuals are increasingly becoming global citizens, either through immigrating or encountering immigrants in their daily lives. Therefore, it is becoming more crucial to gain awareness around the concepts of home, immigration, and personal feelings around them. It is essential to explore the impact of the home environment on individuals' well-being and the role of the home in promoting a sense of belonging and security.

This work is also significant in the way it improves positive emotions and positively affects mental health. According to the case study conducted in this research, home is usually associated with comfort, safety and relaxation. Participants were able to experience similar emotions through the VR sculpture installation. According to the survey questionnaire the most immersive component of the installation was the VR visuals followed by the sound piece and then the soft sculpture. On average, participants experienced improvements in positive feelings like calmness and a reduction in negative feelings like anxiety and fear. It is important to address themes of mental health, particularly for members of the diaspora community. In the context of immigration and displacement, trauma can greatly impact one's ability to establish a sense of home. While my thesis did not specifically focus on addressing trauma, it is important to acknowledge its impact on the mental state of individuals within diaspora communities and their ability to build a sense of belonging. The use of immersive technologies, such as VR and sound, can have potential benefits in addressing mental health issues related to migration and displacement, including the effects of trauma.

This project shed light on individuals' perceptions and experiences of VR visuals and sounds while lying on a soft sculpture, illuminating how they relate to the concepts of home and displacement. Although the user feedback was less on the immigration aspect, as the participants all identified as members of diaspora, this affected their feedback and the impact of the experience on them. By understanding the impact of the home environment on individuals' well-being, this project provides insights into the possibility of looking at home in diaspora through a positive hopeful lens. Furthermore, by examining participants' thoughts on home, this project highlights the need for greater awareness for what home means, both for immigrants and members of diverse societies. Through this project, we can begin to understand how individuals' perceptions of home may change over time and how we can promote a more welcoming and inclusive society.

6. Conclusion

As an artist-researcher, I created *Embosom* to offer participants a multisensory immersive experience through VR visuals, sound, and touch. *Embosom*, as an immersive artwork, has the potential to expand participants' imagination and inspire them to see the idea of home in new ways. This VR sculpture installation combines visuals, a sound piece and haptics to convey the essence of home both physically and emotionally. The study's findings reveal that the designed experience successfully produced a sense of comfort and evoked memories of past and current homes among participants. Participants' feedback also showed that the combination of VR visuals with the comfort of the soft hugging sculpture was successfully harmonized and triggered their imagination. This dual spatial installation also deepened their experience of an immersive environment.

My original aim for this project was to design an experience that recreates the sensation of a parental hug and its inherent support and comfort. However, as I progressed, I realized the potential to create an alternative sense of home through an immersive installation that provides comfort and warmth to improve mental health. This evolution highlights the ever-changing nature of art research and the need to adapt and evolve expectations as the project progresses. The evolution of the project's concept from an experience recreating parental touch to exploring the sense of home has taught me to look beyond the surface level of meaning. I now understand how an environment can also embrace us and provide comfort, warmth, and contribute to a better mental state. This helped me make better connections between seemingly unrelated concepts like a parental hug and home in the eyes of diaspora. I am also looking forward to further exploring mental health as a meaningful direction for my art practice.

One text that particularly impacted me was "The Imaginary" by Sartre (Sartre 2010). As participants experience the virtual space of *Embosom*, they may begin to imagine new possibilities, ideas, or stories based on their experience. This book has inspired me to delve deeper into Sartre's philosophy and create more installations based on his theories of perception, conceiving, and imagination. I am particularly interested in how Sartre related imaginary thoughts provoked by art and how VR visuals can resemble the characteristics of a mental picture. Sartre's concept that mental images are inherently vague and elusive is of great interest to me, and I am eager to explore this notion further in my art through the medium of VR.

This project was my first encounter with VR, and it opened up a whole new world of opportunities and ideas that I can pursue in my practice. Initially, I intended to incorporate technology in the form of interactive physical electronics, but VR proved to be far more successful in immersing participants in my installation because it blocks the outside environment visuals and provides a more uninterrupted focus to the participant. Their feedback led me to consider this medium more seriously and explore it further. Sound was a platform outside of my expertise but collaborating with another artist to create the sound piece for the installation and user feedback helped me realize its importance in my work. This experience demonstrated the value of collaboration and how it can lead to the exchange of ideas and expertise, ultimately enhancing the final outcome of the project. Participants made meaningful connections with the sound, highlighting its significant impact on the overall experience. This collaboration prepared me for future artistic collaborations and reinforced the idea that incorporating diverse perspectives and skill sets can result in powerful and successful artworks.

Furthermore, the future direction of this project may involve exploring the potential of using VR Sculpture Installations in the medical field for pain management treatment, in psychologist clinics as a calming environment before sessions, or in elderly homes to create a more homely atmosphere. These considerations open up new avenues for making art more accessible and integrated into people's daily lives.

In my future practice as an installation artist, I plan to create installations that expand upon the themes and concepts of the original installation by using new multisensory VR technology and interactive experiences to create an even more immersive experience for viewers. Being immersive allows the artwork to have a more profound impact on the viewer, allowing them to engage with it on a deeper level and potentially creating a more memorable and meaningful experience. This project has motivated me to further explore the incorporation of multiple senses in my future art practice. Moreover, my involvement in the Digital Futures program at OCAD has expanded my perspectives on the potential of integrating technology and art.

7. Future Works

As an artist and researcher, I am interested in exploring the potential of virtual reality (VR) as a creative medium. In the future, I plan to continue my work in this area, building on the insights gained from my Embosom project. I also intend to collaborate with other artists and experts in fields such as sound production and psychology to further enhance the immersive qualities of my VR installations. By bringing together diverse perspectives and skills, I believe that we can create more dynamic and impactful experiences for viewers.

In addition to exploring new collaborations, I am also interested in pursuing research on the therapeutic potential of art. Art can have a positive impact on mental health and well-being, particularly in the context of trauma and stress. I believe that VR has the potential to amplify these effects by creating immersive and engaging environments that can help users to process difficult emotions and experiences.

To achieve these goals, I intend to deepen my understanding of the psychology of art and its role in mental health and well-being, by engaging in further research and collaborating with experts in the field. I also plan to continue developing my technical skills and exploring new tools and techniques for creating immersive VR experiences. In conclusion, my future work as an artist and researcher will be focused on using VR as a tool for fostering imagination and creativity, collaborating with other artists and experts to enhance the immersive qualities of my installations, and exploring the therapeutic potential of art in the context of trauma and stress. I continue this journey with an upcoming installation that explores the theme of life and death. This piece explores how the universality of death can create connections and bring people together. Through this work, I plan to continue my exploration of mental health, taking an existential psychological perspective that draws inspiration from the works of Jean-Paul Sartre. This builds on the insights gained from this project and create installations that will engage and inspire viewers.

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9. Appendix

This section contains all the documents used in the case study.

9.1. Consent Form

Date:

Project Title: Embosom

Principal Investigator:

Dr. Claire Brunet

Faculty of Art

OCAD University

(416) 977-6000

cbrunet@ocadu.ca

Co-Supervisor:

Simone Jones

Faculty of Art

OCAD University

(416) 977-6000

sjones@ocadu.ca

Student Investigator:

Zhino Yousefi

Faculty of Digital Futures

OCAD University

647-608-3344

zhinoy@ocadu.ca

PURPOSE:

The purpose of this study is to assess the capability of an art installation in instilling feeling of home and comfort in participants.

10 to 20 participants are recruited for this study and the eligibility criteria is as follows:

I am 18 to 55 years old.

I am not pregnant.

I do not have any known pre-existing binocular vision abnormalities or epilepsy.

I do not have any known current eye infections (e.g., pink eye.)

This research is being completed by a graduate student in partial completion of their degree. The results will contribute to a thesis document.

WHAT'S INVOLVED:

As a participant, you will be asked to:

First, come into a room located at the OCAD Richmond building and are guided through these preparatory steps, which take 10-20 minutes:

1. Read and sign the consent form
2. Respond to 5 interview questions
3. Read and fill out a preliminary mood assessment (survey questionnaire)
4. Listen to the step-by-step guidelines read out by the researcher
5. Q & A

Second, the researcher accompanies participants into the room where the artwork is located. Researcher will assist the participant in sitting on the sculpture. The sculpture is a soft, organic form measuring 150cm x 150cm x 120cm in height, width, and depth. The seating area is only 30cm higher from the floor level, which positions participants in a reclined position close to the ground. The material used in this sculpture is Styrofoam, memory foam, and fabric. The estimated weight of the sculpture ranges between 10-30 kg, depending on the type of foam used. The sculpture is mounted by placing it on the ground with its back against a wall for full support, and dismounting is done by removing it from the ground and transporting it to its storage location.

Then the participant puts on the VR headset (Oculus Quest 2). Participants are asked to fix the binocular angle. Through the VR goggles, the participant sees a virtual scene (nature or space imagery), that includes a 3D view of the sculpture. At the conclusion of the study, the researcher will administer a final survey and conduct a 15-minute interview with the participant to gather data on their emotional feedback.

Participation will take approximately 30 minutes of your time.

The demographic data collected in this research includes age, ethnicity, and gender.

POTENTIAL BENEFITS:

Possible benefits of participation include:

Considering that the research focuses on feelings of home, it could be beneficial for the volunteers and future beholders to engage within a calming virtual immersive experience. The research aims at becoming a sharing experience for the diaspora community.

POTENTIAL RISKS:

There also may be risks associated with participation:

“A comfortable virtual reality experience requires an unimpaired sense of motion and balance. Do not use the headset when you are: Tired; need sleep; under emotional stress or anxiety; or when suffering from cold, flu, headaches, migraines, or earaches, as this can increase your susceptibility to adverse symptoms.

Some people (about 1 in 4000) may have severe dizziness, seizures, eye or muscle twitching or blackouts triggered by light flashes or patterns, and this may occur while they are watching TV, playing video games or experiencing virtual reality, even if they have never had a seizure or blackout before or have no history of seizures or epilepsy. Such seizures are more common in children and young people under the age of 20. Anyone who experiences any

of these symptoms should discontinue use of the headset and see a doctor. Anyone who previously has had a seizure, loss of awareness, or other symptom linked to an epileptic condition should see a doctor before using the headset.

Use of the headset may cause loss of balance.

Do not handle sharp or otherwise dangerous objects while using the headset.

Make sure the headset is level and secured comfortably on your head, and that you see a single, clear image.

Ease into the use of the headset to allow your body to adjust; use for only a few minutes at a time at first, and only increase the amount of time using the headset gradually as you grow accustomed to virtual reality. Looking around when first entering virtual reality can help you adjust to any small differences between your real-world movements and the resulting virtual reality experience. Take at least 10-to-15-minute breaks every 30 minutes, even if you don't think you need it. Each person is different, so take more frequent and longer breaks if you feel discomfort. You should decide what works best for you.

If using headphones, listening to sound at high volumes can cause irreparable damage to your hearing. Background noise, as well as continued exposure to high volume levels, can make sounds seem quieter than they are. Due to the immersive nature of the virtual reality experience, do not use the headset with the sound at a high volume so that you can maintain awareness of your surroundings and reduce the risk of hearing damage.

Using the device may make your muscles, joints or skin hurt. If any part of your body becomes tired or sore while using the headset or its components, or if you feel symptoms such as tingling, numbness, burning or stiffness, stop and rest for several hours before using it again. If you continue to have any of the above symptoms or other discomfort during or after use, stop use and see a doctor.

To avoid transferring contagious conditions like conjunctivitis (pink eye), do not share the headset with persons with contagious conditions, infections, or diseases, particularly of the eyes, skin, or scalp. The headset should be cleaned between each use with skin-friendly non-alcoholic antibacterial wipes and with a dry microfiber cloth for the lenses.

The headset is worn next to your skin and scalp. Stop using the headset if you notice swelling, itchiness, skin irritation or other skin reactions. If symptoms persist, contact a doctor." ("Health & Safety." ClassVR, May 23, 2022. <https://www.classvr.com/policies/health-and-safety/>)

CONFIDENTIALITY:

The data gathered in this research is confidential (non-identifiable but not anonymous to researchers) and stored in a password protected laptop that only the researchers have access to.

Data collected during this study will be stored digitally on the researcher's computer.

Data will be kept for 8 months after which time all data will be permanently deleted.

Access to this data will be restricted to Claire Brunet, Simone Jones, and Zhino Yousefi.

There are no incentives provided as part of this study.

VOLUNTARY PARTICIPATION:

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study during or right after the process and you may do so without any penalty or loss of benefits to which you are entitled. Your choice of whether or not to participate will not influence your future relations with OCAD University or the investigators [Claire Brunet, Simone Jones, Zhino Yousefi] involved in the research. To withdraw from this study, let PI know at any point during the study. To withdraw your data from the study, please tell the researcher verbally during or right after experiencing the VR sculpture installation. The day of withdrawal will vary based on the date participant comes in but will fall between Feb 15th, 2023, and the end of the case study on February 28th, 2023.

PUBLICATION OF RESULTS:

Results of this study may be published in student thesis or website blog. In any publication, data will be presented in aggregate forms. Quotations from interviews or surveys will not be attributed to you.

Feedback about this study will be available on www.zhinoyousefi.com

CONTACT INFORMATION AND ETHICS CLEARANCE:

If you have any questions about this study or require further information, please ask. If you have questions later about the research, you may contact the Principal Investigator Claire Brunet or the Co-Supervisor Simone Jones using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at OCAD University.

If you have questions regarding your rights as a participant in this study, please contact:

Research Ethics Board c/o Office of the Vice President, Research, and Innovation

OCAD University

100 McCaul Street

Toronto, M5T1W1

416 977 6000 x4368

research@ocadu.ca

AGREEMENT:

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Form. I have had the opportunity to receive additional details about the study and understand that I can also ask the researcher more questions in the future. I understand that my consent could be withdrawn by telling the researcher verbally during or right after experiencing the VR sculpture installation.

Name: _____

Signature: _____ Date: _____

Thank you for your assistance in this project. Please keep a copy of this form for your records.

9.2. Interview Questionnaire

Gender: M F non-binary gender non-conforming prefer not to say

Age group: 018-25 026-35 036-45 046-55

As an installation artist interested in diaspora and home, I am exploring the relationship between home, immigration, and diasporic life. Before we begin, I want to assure you that everything you share in this document will be confidential and destroyed at the end of my research (within 3 months). I will be asking you a few questions, and if at any point a question makes you feel uncomfortable, please feel free to skip it. Are you ready to begin?

Before the experiment:

1. What does "feeling homey" mean to you?
2. Do your feelings towards your current home environment affect your day-to-day mental and physical well-being?
3. Have your thoughts on immigration changed during your journey? How?
4. Do you sometimes feel nostalgic about your home country? If so, how often do you think about that?

After the experiment:

After experiencing this immersive installation, I would like to see how your interaction affected your emotions and whether it provided you with insights around the concepts of immigration and being at home. Please feel free to share anything that stood out to you or any subtle changes or memories you might remember in relation to the installation.

1. What emotions and insights did you experience in your interaction with the VR sculpture installation?
2. Which sensations were dominant in your interaction, and what elements of the artwork triggered those feelings?
3. Did this experience bring any specific memories of home back to you?
4. How did the physical sculpture affect your perception of the virtual reality visuals?
5. Did the sound of the installation make your experience more immersive? In what ways?
6. Did any of the technical gear of the VR sculpture installation (e.g., warmth, goggles, etc.) trigger any discomfort or distract you from fully immersing yourself in the interaction?

9.3. Survey

After engaging with the interview questionnaire, we would like participants to rate their current emotional state before and after their interaction with the installation. Please rate the following emotions on a scale of 0-10 for each emotion before and after your interaction. This data will help us understand any changes in emotions that may have occurred, which will be measured on a scale of -10 to 10. The data collected will be analyzed for further insights.

Please rate (0-10) the following emotions based on your current mood:

1. Happiness	
2. Optimism/Positivity	
3. Calm	
4. Sensuality	
5. Awareness	
6. Insecurity	
7. Fear	
8. Irritability	
9. Anger	
10. Nervousness	

Please rate the following emotions based on your current mood:

1. Happiness	
2. Optimism/Positivity	
3. Calm	
4. Sensuality	
5. Awareness	
6. Insecurity	
7. Fear	
8. Irritability	
9. Anger	
10. Nervousness	

9.4. Recruitment Document

The following document was posted at OCAD University inviting volunteers to participate in the research case study questionnaire and survey.

Do you consider yourself as being part of the diaspora?

You May Qualify If You

- Are between 18 and 55 years old.
- Are not pregnant.
- Have no history of binocular illness.
- Do not have epilepsy.
- Do not have a current eye infection.

Potential Benefits

Participating in this study may provide you with a homey feeling and a relaxing experience.

Location:

205 Richmond St., Toronto

Participants will NOT be compensated.

For more information, please contact Zhino Yousefi, Email: zhinoy@ocadu.ca

9.5. Thesis Presentation Slides

Presentation by Zhino Yousefi

Embosom

Exploring the Concept of Home Through a
Multi-sensory Virtual Reality Installation

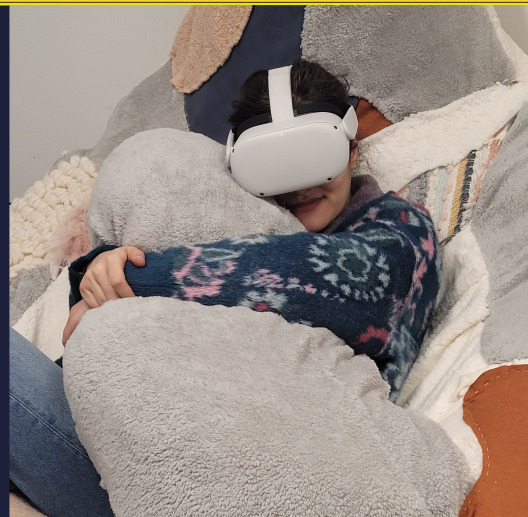
www.zhinoyousefi.com

OCAD University ✦ Digital Futures ✦ Apr 2023

Advisors: Dr. Claire Brunet, Simone Jones

Introduction

- Themes of **home** and the journey of **diaspora**.
- **Soft sculpture** hugging and immersing participants.
- **VR** visuals are supported by a **sound** piece to stimulate **imagination**.



Motivation

- Rediscovering my **personal** feelings as an immigrant towards the concept of home
- Capturing and sharing the **essence of home** and its **fluidity** for the diaspora through a multi-sensory installation
- Presenting a **positive** perspective defying the common negative connotations associated with immigration

Research Questions

- What are the affordances of **multi-sensory, VR** sculpture installations in exploring the psychology of **home** and instilling a feeling of physical and emotional comfort?
- How can VR enrich the viewer's sensorial experience through a **dual spatial** environment; real and virtual?
- In what ways can **sound** and **touch** be used to enhance the viewer's phenomenological experience?

Methodology

- 1 **Psychology of Home in Diaspora**
 - Bhandari
- 2 **Phenomenology of VR**
 - Sartre
- 3 **Phenomenology of Touch and Sound**
 - Merleau-Ponty
 - Serres

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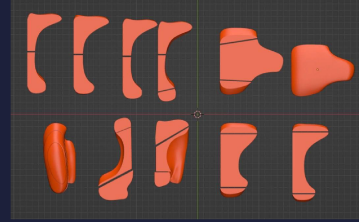
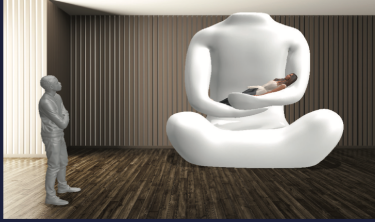


Research Approaches

- 1 **Case Study**
 - Interview questionnaire
 - Survey on emotional response
- 2 **Research Creation**
 - Design iterations and prototyping
 - VR and sound design

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Prototyping



Graduate Exhibition



VR & Sound Design

Ambiance

- Dark background with no horizon
- The **floating** and **moving** quality of the room
- Soothing sound piece.

Symbolism

- Doors and windows symbolize **hope** and a **desire** to look outwards.
- VR particles show countless experiences and elements creating a home.

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Outcomes

- Increase in positive feelings and a reduction in negative feelings.
- VR visuals were the most dominant element followed by sound.
- The physical sculpture provided a homey feeling supporting VR and sound.



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Significance

- Engage participants' **imagination** and inspire them to see the idea of home in new ways.
- Positively **comforted** participants and evoked **memories** of home.
- **VR** due to its ability to block out external stimuli was highly effective in making the viewer feel **homey**.
- The use of sound and touch also added to the sense of comfort, familiarity, and wonder.

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Future Work Direction

- Using VR as tool to encourage **imagination** in art viewers.
- Collaboration with other artists especially for **sound design**
- Using research creation to further explore the role of art in improving **mental well-being**.

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**Thank
You!**

OCAD University ✦ Digital Futures ✦ April 2023