

दर्शन

## Darśana - Dance for Kṛṣṇa

Harshal Pilia

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**Keywords:** *Immersive Technology, Interactive Installation, Hindu mythology, Projection Mapping, Spatial Audio, Cultural Preservation, Motion capture, Vrindavan, Lord Krishna, India, New Media Art, Virtual Environments, Experiential Storytelling, Human Centered Design*





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Harshal Pilaiania



## **MASTER'S THESIS**

to achieve the university degree of  
Master of Fine Arts  
in Creative Technologies

submitted to

**School of Visual Arts**  
**College of Architecture, Arts, and Design**  
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## **Committee**

Chair - Meredith Drum  
Michael Borowski  
Annie Ronan



चालाँ अगम वा देस, काल देख्याँ डराँ।  
भराँ प्रेम रा होज, हँस केल्या कराँ।  
साधा संत रो संग, ग्याण जुगता कराँ।  
धराँ साँवरो ध्यान, चित उजलो कराँ।  
सील घूँघरा बाँध, तोस निरताँ कराँ।  
साजाँ सोल सिंगार, सोणारो राखड़ाँ।  
साँवलिया सू प्रीत, मीराँ सूँ आखड़ाँ।

- मीराबाई (१४९८ - १५४६) [1]

*Go to that impenetrable realm that death himself trembles to look upon.  
There plays the fountain of love with swans sporting on its waters.  
There the company of holy men is available,  
and one may talk of spiritual knowledge.  
There one can meditate on Shyam (Kriśna) and purify one's mind.  
There one may bind on the anklets of good-conduct,  
and dance the dance of inner contentment.  
There one may adopt a headpiece of gold and the sixteen kinds of adornment.  
Let there be love for Shyam and indifference to all else.*

- Mirabai (1498 - 1546)

Translated by A.J. Alston [2]

# Disclaimer

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Darśana is the final thesis project of Harshal Pilia, an MFA Creative Technologies student from India. This project does not endorse or promote any religious beliefs. Instead, it seeks to offer a reimagined experience of certain Hindu traditions, as personally interpreted by the creator.

# Abstract

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Darśana is an an interactive, multi-channel installation offering participants an artistic, somatic immersion in Hindu mythology. The exhibit interprets the Hindu concept of 'darśana'—a practice involving the experience and observance of a deity—through a contemporary lens. At the heart of the installation is Lord Kṛṣṇa, the beloved flutist deity celebrated for his wisdom and charm. Participants are immersed in a digital rendition of his native forested land, Vṛndāvana. Here, they are encouraged to move, dance, and interact with their surroundings.

By presenting ancient stories through new media technologies, "Darśana" explores the potential of modern technology to reinterpret and revitalize traditional practices and beliefs for contemporary audiences, drawing their attention to their cultural heritage.

It was first exhibited at the Cube in Moss Arts Centre, Alumni Mall, Blacksburg, Virginia, USA, on 2nd and 3rd May.

This document outlines the research and process involved in bringing this vision to life.

**Keywords:** *Immersive Technology, Interactive Installation, Hindu mythology, Projection Mapping, Spatial Audio, Cultural Preservation, Motion capture, Vrindavan, Lord Krishna, India, New Media Art, Virtual Environments, Experiential Storytelling, Human Centered Design*

# The User Journey

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A participant enters the Moss Arts Center and is welcomed by me or an usher, who hands them a brochure containing contextual and practical details about the experience. This brochure is intended to be read while they wait for their turn. When the exhibition becomes available, I or the usher escorts them into a small, intimate room with two benches. The user is asked to sit on the benches while we briefly introduce the experience, explaining that it is interactive and that they are encouraged to move or dance around the space to activate the visuals. We ask them to remove their footwear if they are comfortable doing so and offer them ankle bells to wear.

Once ready, participants are invited to enter the "virtual temple" at their own pace. The experience is motion-activated and begins as soon as they step into the temple. The first two minutes provide an introduction to Kṛṣṇa and the participant's role in the experience, followed by six minutes of interactive engagement.

During the introduction, participants are gradually transported, both visually and aurally, into the virtual Goloka, Kṛṣṇa's spiritual realm. Initially, the space is devoid of plants, with Kṛṣṇa dancing alone in the distance. Over the next five minutes, as participants move around and interact with the environment, six species of plants gradually grow. In the final minute, during the crescendo of the soundscape, participants are transported out of the virtual Goloka. Through their devotion to Kṛṣṇa, they leave the place enriched, with fully grown plants [Fig. 8.1].

When the visuals fade to black and the sound stops, it signals the end of the session. Participants then remove the ankle bells, put on their footwear, and exit the cube.

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# My Creative Journey

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In this paper, 'darśana' (with quotation marks and lowercase 'd') will refer to the traditional Hindu practice, whereas Darśana (without quotation marks and with an uppercase 'D') will refer to my exhibition titled Darśana.

*This paper is divided into seven primary chapters, each exploring one of the seven significant concepts that inform this project, followed by details of the final experience, a list of technologies, and a conclusion. These concepts are also highlighted in the abstract in bold. This chapter will delve into how various personal and professional experiences from my past have culminated in the development of this project.*



## 1.1 Festivities - A Creative Endeavor

A photograph taken in 2018 shows me on the edge of my home's roof in India, fixing series lights for one of the most famous Hindu festivals—Diwali [Fig. 1.1]. Since childhood, I have been responsible for decorating our house with lights and flowers for various festivals. Fixing series lights, setting up laser lights, creating ambiance with a speaker system, preparing thematic playlists, sourcing flowers from the market, and climbing ladders to install decorations gave me immense satisfaction. I eagerly anticipated these festivals each year for the joy of creating an experience. Only through reflection has it become clear that this endeavor was a deep-seated passion, although at the time, it was merely a responsibility.

## 1.2 My First Art Installations

Kṛṣṇa Janmashtami is an annual Hindu festival celebrating the birth of Lord Kṛṣṇa. It takes place on the eighth day of the waning cycle of the moon during Bhādrapad (between August and



Figure 1.1: Harshal Pilania fixing lights on his house's roof



Figure 1.2: Janmashtami, 2015



Figure 1.3: Janmashtami, 2016

September). In my home, we would swing our little Lord Kṛṣṇa on a swing throughout the night as we celebrated his birthday. Hymns, chants, and prayers were sung, accompanied by musical instruments and occasional dancing. Reflecting on it now, decorating the swing was one of my first immersive installations and venues for exploring my creativity. Initially, I would decorate the swing with flowers and leaves, such as rose, marigold, tuberose, night-jasmine, Indian basil, and sacred fig. Eventually, I began using series lighting and essentially designing the set of Vṛndāvana around the swing [Fig. 1.2, 1.3].

## 1.3 Transdisciplinary Creativity

Creativity has always held a special place in my life. I enjoyed creating anything and everything—architecture models for school projects, films for my sisters’ birthdays, poems for myself, and brands for my friend circles. I studied Business Administration in my bachelor’s and then freelanced as a multimedia designer for two years. I ventured into advertisement films, short fictional films, brand design, websites, print collateral, campervan design, dog houses, and more. Until 2022, these multiple mediums were driven by curiosity, exploration, and a love for learning new software and technologies. These works can be browsed at [art.harshalpilania.com](http://art.harshalpilania.com).

In 2022, I realized I didn’t want to specialize in one medium. I wanted to create using all available resources. I found the MFA Creative Technologies program, where I explored various mediums and the spaces between them. I delved into 3D modeling, game design, digital crafting, sculpture, video compositing, teaching, and more. During this exploration, I discovered TouchDesigner.

## 1.4 TouchDesigner - Initial Installations

TouchDesigner is a node-based visual programming language for real-time interactive multimedia content, developed by the Toronto-based company Derivative. It’s been used by artists, programmers, creative coders, software designers, and performers to create performances, installations, and fixed media works. It allowed me to combine multiple mediums and create diverse visual and aural experiences. The more I used it, the more I loved it. With TouchDesigner, I created my initial two interactive installations: *Azadi*, 2022 [Fig. 1.4] and *Bloom*, 2023 [Fig. 1.5].

### 1.4.1 *Azadi*, 2022

In collaboration with Diane Relf, a local repurpose artist in Christiansburg. She had run into a collection of paintings that were being disposed in order to empty a shed. She sought artists to repurpose those paintings. I got one of a solitary blue flower trapped in a window frame. This image stirred thoughts of confinement and captivity, resonating deeply as I followed the

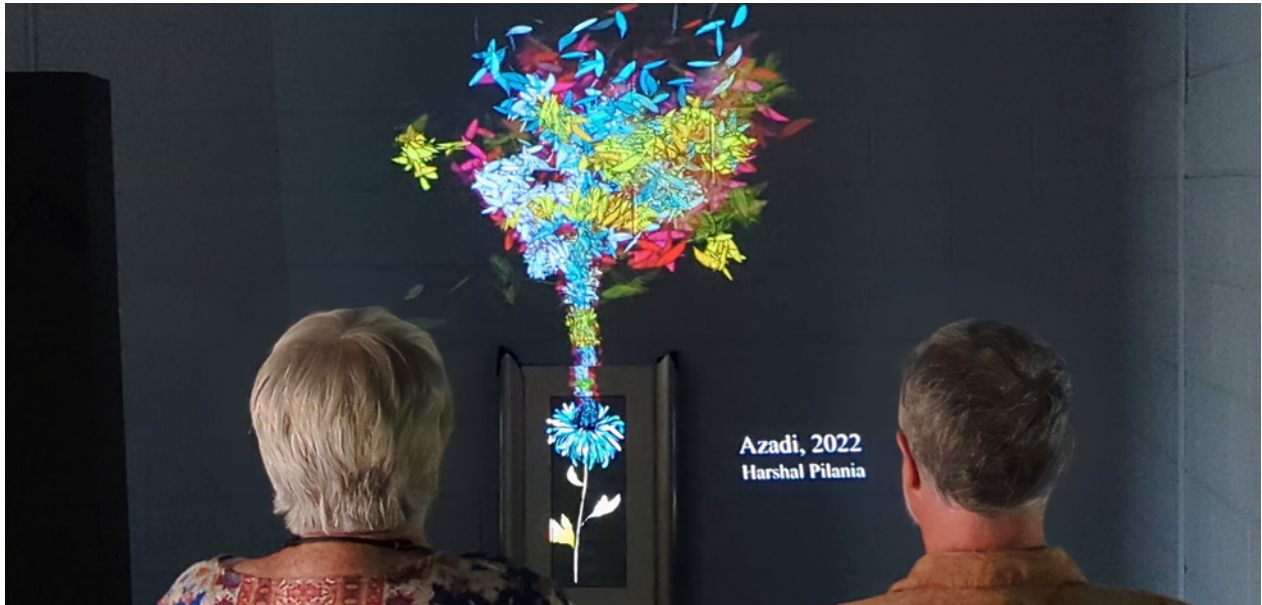


Figure 1.4: Azadi: interactive installation at Altered Art Exhibition, Shawsville, VA (2022)



Figure 1.5: Bloom: interactive installation at MFA Grad Exhibition, Blacksburg, VA (2023)

women's rights protests in Iran. The Persian song "Baraye" by Shervin Hajipour, which echoes the dedication of one's life to the greater good and ultimately to freedom, provided further inspiration.

With these influences, I created an interactive projection mapping program using TouchDesigner and titled the altered artwork "Azadi," which means "Freedom" in Persian, Hindi, and Urdu. In "Azadi," the petals of the blue flower burst out of the window frame in response to the audience's sound. The louder the audience, the more petals erupted, creating a dynamic and engaging visual experience.

This fusion of art and technology aimed to connect participants to the struggle for liberation. "Azadi" symbolizes the relentless pursuit of freedom and underscores the importance of raising one's voice for the greater good. Through this interactive piece, I sought to evoke empathy and solidarity with those fighting for their rights, emphasizing the power of collective action and the enduring hope for freedom.

### 1.4.2 Bloom, 2023

Continuing the theme of raising one's voice and crying out for help, "Bloom" is an interactive light sculpture installed at "The Space We Have" - the Creative Technologies Graduate Exhibition at the Media Annex, Virginia Tech, in November 2023. The central bulb of the flower responds to voices in the room, increasing in intensity with louder sounds and gradually shifting colors if the participant makes noise consistently.

Right before the pandemic, my father planted around 20 different types of flowers in our garden, which became drenched with colors and scents throughout the lockdown. In December 2020, I noticed three plants were tangled and weak. Unaware they were Dahlias, I tied threads to individual branches and hung them up. By January 2021, each plant had bloomed a single beautiful flower, each with several red petals and one distinct white petal, as if they were trying to convey a message.

I created "Bloom" in 2023 to commemorate this story. The sculpture reflects my urge to help others and my struggle with asking for help. The petals, made of metal and welded together, symbolize the rigidity of not seeking help, with one wooden petal mimicking the original white petal. I allowed the sculpture to rust outdoors, using vinegar and salt to accelerate the process, symbolizing the passage of time and the inevitability of change.

This project deepened my interest in interactive art and opened up an avenue for my past experiences to resurface in my work. My extensive exploration of TouchDesigner and interactivity at this stage naturally led me to create an interactive installation for my thesis.

## Immersion - A Holistic Medium

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*This chapter explores the concept of immersive experiences, discussing how they transport participants to different realities by engaging multiple senses. It contrasts modern examples and artists' works that influenced my creative direction. The chapter also highlights Hindu festivals as inherently immersive, utilizing all five senses, and explains how my project aims to recreate this immersion through new media technologies to offer a 'daršana' experience.*



### 2.1 Immersive Experiences

Immersive experiences typically involve altering the participant's reality—visually, aurally, semantically, and more. Examples of modern immersive experiences include virtual reality worlds like the Metaverse, augmented reality headsets like Apple Vision Pro, and projection mapping installations like the Sphere in Las Vegas. An immersive experience transports the audience to a different space and time—an alternate reality, whether imagined or real—by engaging one or more senses, usually visual and auditory. The more immersive and engaging the experience, the stronger the emotional connection to it. Engaging multiple senses strengthens this connection, creating a richer human experience [3].

### 2.2 Relevant Works and Artists

My first encounter with a contemporary immersive experience occurred in June 2023 at the Van Gogh Immersive Experience in Washington, DC [Fig. 2.1]. The Van Gogh Immersive exhibit uses digital projection mapping to immerse the participants in the artist's paintings, animated with descriptive narration and a soundscape. Based on the social media hype, I had high expectations but was ultimately disappointed. The scale and accompanying crowd of the event detracted from



Figure 2.1: Van Gogh Immersive Experience, Washington DC, 2023

its immersive nature, failing to transport me out of our reality into another realm. Additionally, the objective documentary style of the presentation prevented me from relating to the visuals or the art. I felt like a passive voyeur with no contribution to the experience.

In contrast, Chiharu Shiota's physical immersive installations resonate deeply with me. Shiota is known for her large-scale, intricate installations using thread, typically in red, white, or black [Fig. 2.2]. Her work often derives from her personal experiences as an immigrant artist from Japan, now based in America. She uses simple, relatable motifs such as doors, chairs, letters, boats, and houses to convey ideas of memory, absence, and connection. Because of the personal nature of her work, I can relate to it more. The enveloping nature of her installations is also successful in "immersing" participants into the experience. Participants feel intimately connected with the artwork, surrounded by it physically and emotionally.

Joon Yong Moon's "Chasing Stars in Shadows" [Fig. 2.3] significantly influenced my creative direction. In this installation, projected shadows respond to a participant's torchlight, creating optical illusions that transform 2D surfaces into 3D windows into other places. This interactive narrative progresses as viewers use their light to find and engage with shadow characters, who transition from flat shadows to three-dimensional forms. The immersive environment, filled with virtual image projections, captivates the viewer in a 14-minute experience where they help the shadow kids explore hidden spaces behind the walls. I am drawn to the simplicity of his subjects and visuals, as well as his intention to design playful experiences for younger audiences. Playfulness has been a crucial aspect of my own creative journey. The low-poly nature of his visuals also amplifies the playful nature and encourages imagination, as the less you reveal, the more they get to imagine.



Figure 2.2: "Signs of Life" by Chiharu Shiota, New York, 2023

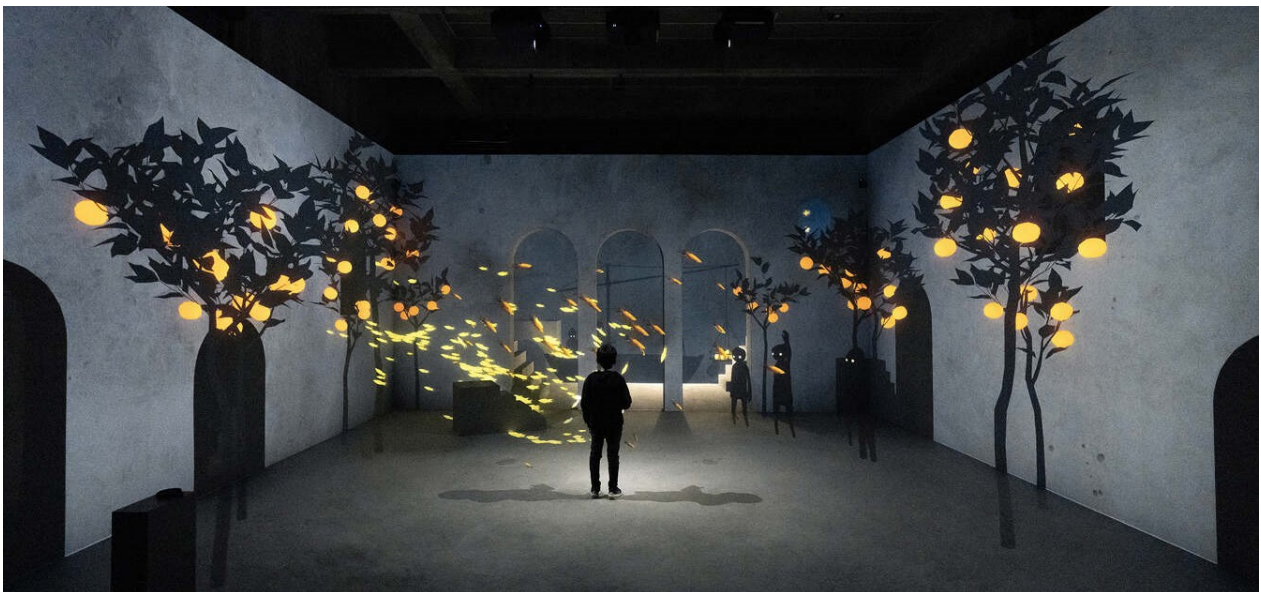


Figure 2.3: "Augmented Shadow: Chasing Stars in a Shadow" by Joon Yong Moon, 2022

## 2.3 The Hindu Immersive Experience

While the Van Gogh Experience was my first contemporary immersive experience, I have come to realize that all Hindu festivals are inherently immersive. Along with being an avenue for creative exploration, all the festivities I partook in during my childhood were essentially my first immersive experiences. Hindu festivals are vibrant and multisensory, engaging participants through sight, sound, smell, taste, and touch. The visual splendor of these festivals is evident in the colorful decorations, intricate Rangoli (an Indian art form in which patterns are created on the floor using materials such as powdered limestone, red ochre, dry rice flour, colored sand, etc.) designs, and beautifully adorned deities. The sounds of chanting, devotional songs, and musical instruments create an auditory landscape that envelops the participants. The fragrant aromas of incense, flowers, and food offerings enhance the sensory experience. The taste of prasad, or blessed food, provides a culinary connection to the divine, while the physical act of participating in rituals, touching sacred objects, and interacting with other devotees completes the immersive experience.

## 2.4 Creative Influence on Darśana

Studying these works helped me narrow down the key characteristics for my exhibition, implemented through various channels. The physical installation of screens measured 12 feet wide by 12 feet deep by 7 feet tall, creating an enveloping environment. At the entry, participants would sit on benches in an alley to take off footwear and wear the ankle bells. It was intentionally constructed to allow just enough space for participants to sit and maneuver, enhancing the sense of closeness. This intentional compactness fostered a more intimate and hence immersive experience.

The visual elements, including Kṛṣṇa, plants, and temples, were designed in a low-poly style to encourage imagination and make the visuals more approachable. Kṛṣṇa's playful interactions, where he teased participants by moving away and hiding among the plants when they stopped dancing, exemplified the playful interactivity I aimed for. This engagement is intended to keep participants actively involved and heightened their sense of immersion.

The project drew heavily from my personal experiences, which were conveyed through interactions with participants and during presentations about the project. Simple, readable motifs such as flowers, the anthropomorphic form of Kṛṣṇa, temple architecture, the moon, and stars were used to channel elements from mythological tales to the participants. These motifs were carefully chosen to be easily recognizable and relatable.

In her 1981 book "Darsan," Diana L. Eck illustrates the religious environment in India as one catering to all five senses, with an emphasis on the visual [4]. By catering to four of the five senses through new media technologies, the installation offers global audiences without Hindu cultural training a peek into the 'darśana' experience:

1. Visuals through Projection Mapping

2. Aural through Spatialized Audio
3. Haptic through barefoot movement and bells tied to ankles
4. Olfactory through sandalwood essential oil electric diffuser

Combing compact spatial design, playful interactivity, playful interactivity, personal significance, along with simple, readable motifs, and a multi-sensory immersion, I created Daršana to offer my participants meaningful and pleasurable experiences for my participants.

## The Multi-faceted Hindu Divine

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*This chapter explores the multifaceted nature of Hindu deities and the significance of sacred places. Additionally, it examines the creative freedom devotees have in shaping religious narratives, offering insights into the rich and vibrant Hindu culture.*



### 3.1 My Perception of a Divine Energy

In June, 2023, in the early ideation phase of my thesis project, I was reflecting deeply on my perception of the Divine. I view the divine as an omnipresent energy that guides me through life. I perceive this beautiful presence in the sun rays, in someone’s eyes, and in everything around me. In my daily life, whenever I approach an activity with meditative focus and wholehearted devotion—whether it’s leisurely strolling through nature, caring for plants and animals, sitting in quiet contemplation, or dancing fervently to music—I encounter a similar profound, almost divine energy. I wanted to enable others to experience this feeling. However, my perception of the divine is not entirely my own but has been nurtured through years by my Hindu family and my exposure to diverse cultures around me. To consider these sources of experiences and hence knowledge as “valid” is deeply embedded in the Indian philosophical context and shapes one’s understanding of the divine [5].

From childhood, I was taught to see the divine in everything around me. The places and natural elements associated with each deity contribute to their divine presence. Hindu pilgrims travel thousands of miles to receive ‘darśana’ (discussed in detail in Chapter 7) of these sacred features: Himalayan peaks, the river Ganga, birthplaces of deities, caves, etc. The divine in India is visible in all existence, including nature, humans, places, and more. The ‘darśana’ of a deity is not limited to the idol alone but extends to the geography, the journey, the priests, and all aspects of a devotee’s pilgrimage [4]. Hindu concepts like “darshan” (to see), “anubhuti” (realization), “bhakti” (devotion), “smrti” (memory), and “stuti” (praise) hold a much larger and spiritual meaning than



Figure 3.1: Various Ganpati Forms: Contemporizing Hindu Deity Narratives

their English counterparts in the Hindu context and play a vital role in enabling devotees to comprehend and experience the divine [5].

## 3.2 Hinduism - A Personalized Religion

To understand Hinduism, one must first grasp that we have 33 million gods [6]. These deities come in many forms: blue, orange, red, black, white, green gods; gods that dance, kill, sing, distribute knowledge, or wealth; gods who ride peacocks, lions, cows, snakes; gods that are destructive or creative; and gods that are genderless, gender-fluid, or transgender [7]. Hence, Hinduism is a highly personalized religion, allowing individuals to choose their deity based on personal interests and beliefs. This multiplicity enables the idea of the divine as a multifaceted phenomenon, embodying many things simultaneously. This cultural and religious contextualization is crucial for fully engaging with the multifaceted nature of Hindu deities and perceiving all of those natures as true sources of knowledge [8].

## 3.3 Devotees' Creative Liberty

Hindu devotees also have a certain creative liberty with the narratives of their deities. They can contemporize the narratives of any deity while maintaining respect. One of the most popular Hindu deities, Ganesha or Ganpati, is celebrated every year for 7-10 days on his birthday. Devotees commission or create a statue of the deity, which is prayed to during the celebration and then immersed in the nearest water body. Devotees decide the role they want Ganesha to play each year. In 2020, he was depicted as a doctor to increase faith in the medical force during COVID-19

[9]. In 2023, following India's successful moon landing, he was portrayed on a spaceship to the moon [10] [Fig. 3.1]. This creative freedom enabled me to interpret my own form of Kṛṣṇa for this project [Fig. 4.4].

I realized that helping others experience the divine as I do would be challenging, as it is not a momentary experience but enabled by years of cultural training. However, during this research, I rediscovered my love for the rich and vibrant Hindu mythology and culture. So, I decided to shift my focus. While I could not replicate my personal spiritual encounters, I could still create an experience that showcases this richness.

## Kṛṣṇa - The Darling Deity

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*This chapter explores the multifaceted character of Kṛṣṇa, from his mischievous childhood in Vṛndāvana to his wisdom as depicted in the Bhagavad Gita. It details personal connections to Kṛṣṇa through family traditions and early artistic expressions. The chapter also discusses the creation of an abstracted 3D model of Kṛṣṇa, influenced by contemporary surreal artists and concepts of "cuteness" to evoke a welcoming and endearing presence.*



### 4.1 A Wise Friend

Hindu divinity features a holy trinity at the top of a hierarchy of over 33 million gods and goddesses. This trinity comprises Lord Brahma (the creator), Lord Vishnu (the caretaker), and Lord Mahesh (the destroyer). Together, they are responsible for everything that exists. Lord Vishnu, as the caretaker, has manifested himself in human form throughout history whenever circumstances on Earth required him. Kṛṣṇa, Lord Vishnu's eighth avatar, is considered the supreme god in some Hindu sects, even surpassing the holy trinity.

Kṛṣṇa, the central blue figure in Syamarani Dasi's "Venu Gita" [Fig. 4.1], is renowned as a charming and mischievous child who grows up to become an omniscient friend, teacher, and counselor. He is first introduced in the epic Mahabharata as the humble and loyal charioteer and counselor to warrior Arjuna. A 700-verse discourse between Kṛṣṇa and Arjuna on the battlefield, known as the Bhagavad Gita ("The Song of God"), outlines thought exercises and disciplines leading to "Moksha" (salvation) and is considered the holiest text in Hinduism.

### 4.2 A Notorious Child

Kṛṣṇa grew up with his step-parents in Vṛndāvana, leading a life filled with fun, play, mischief, love, and pampering. As Kinsley illustrates, "He scrambles around the cowherd village with

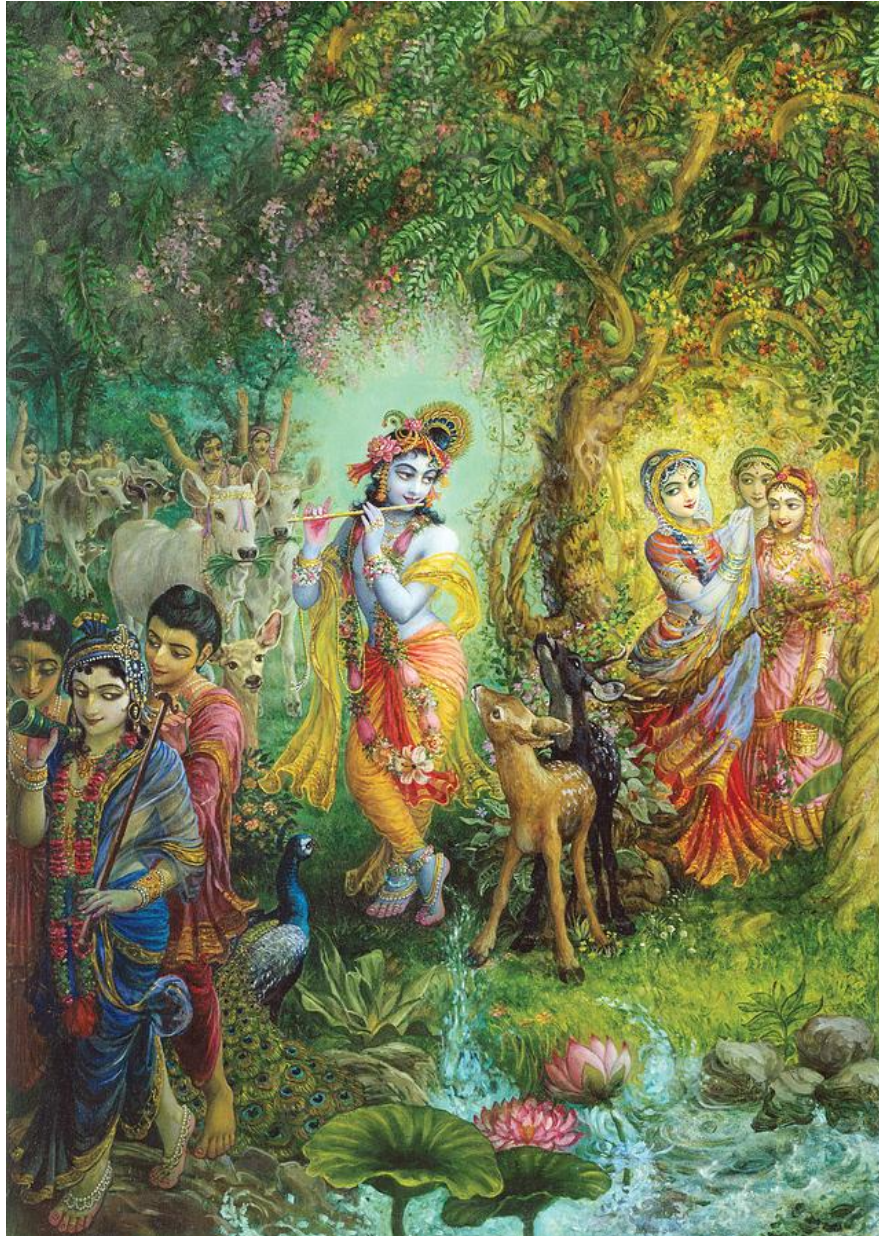


Figure 4.1: Venu Gita (Song of the Flute) by Syamarani Dasi, 2009



Figure 4.2: My mom’s idol of Laddu Gopal dressed on different occasions

Balarama, his elder brother, plays with his own shadow, rolls in the dust, dances to make his bangles jingle, eats dirt despite his mother’s warning, laughs to himself, or sits quietly absorbed in his own imaginings” [8]. Kṛṣṇa’s personality as a notorious child mirrors the characteristics of a healthy boy growing up in India. The Indian subcontinent is fascinated with the wild Kṛṣṇa, who is adored as a parent dotes on a child or as a woman dotes on her beloved. In the Harivamsa Purana, Kṛṣṇa’s play is described as “fire in the cremation ground”: leaping, flickering, erratic, and vigorous.

Fond of dairy products—milk, cheese, cream, and especially fresh butter (makkhan) paired with rock sugar (mishri)—Kṛṣṇa’s fondness is reflected in offerings at Kṛṣṇa temples. Additionally, Kṛṣṇa is a master of the flute, whose melodies charm all around him, causing plants, animals, and all existence to dance to his tunes.

### 4.3 My Mom’s Laddu Gopal

My mom has consistently assured me, “Laddu Gopal sab sahi karege” (Lord Kṛṣṇa will ensure our well-being). She had taken up the responsibility of a Laddu Gopal (literally translating to “A sweet friend of the cattle”) idol long before I was born. This practice, common in many Hindu households, involves women bringing home an idol of child Kṛṣṇa (Laddu Gopal) and caring for it throughout their lives. I’ve watched my mom, through sickness and hardships, bathe, dress, offer food, and put our Laddu Gopal to sleep every day without fail [Fig. 4.2]. As a child, I would run to his idol whenever I was in trouble to ask for help. Kṛṣṇa was my first friend and has been present with me ever since. This belief in Kṛṣṇa’s omnipresence is rooted in a popular Hindu belief in singularity—that God is one with all existence, including us.



Figure 4.3: Painting of Abstracted Kṛṣṇa by Harshal Pilia

## 4.4 My Abstracted Virtual Kṛṣṇa

I channeled a combination of my theoretical and artistic research combined with my personal perception of him into a painting as an abstracted version of Kṛṣṇa [Fig. 4.3]. This painting was then built into the 3D model in Blender and rigged with the help of the AutoRigPro plug-in. I finalized the model with minimal ornamentation—waistband, headband, flute, ankle bells, and a peacock feather. All of these elements are intricately linked with the image of Kṛṣṇa and always accompany him. Then, the Motion Capture recordings from India were remapped to this model [Fig. 4.4].

In addition to the theory, the visual form of my Kṛṣṇa was also influenced by the work of the following contemporary surreal artists:

### 4.4.1 Artistic Influences

Antanas Gudonis’s abstract surrealist worlds [Fig. 4.5] satisfy my visual and fantastical cravings with his earthy color palette and seemingly friendly, approachable creatures. Gudonis’s art often blends the fantastical with the familiar, creating environments that are both otherworldly and accessible. In my 3D model, I drew inspiration from Gudonis’s ability to create a sense of whimsy and wonder.

David Alvarez’s sketches, which often depict night scenes through shadows of ethereal beings [Fig. 4.6], play with scale and human body composition, evoking a sense of abstract divinity. The

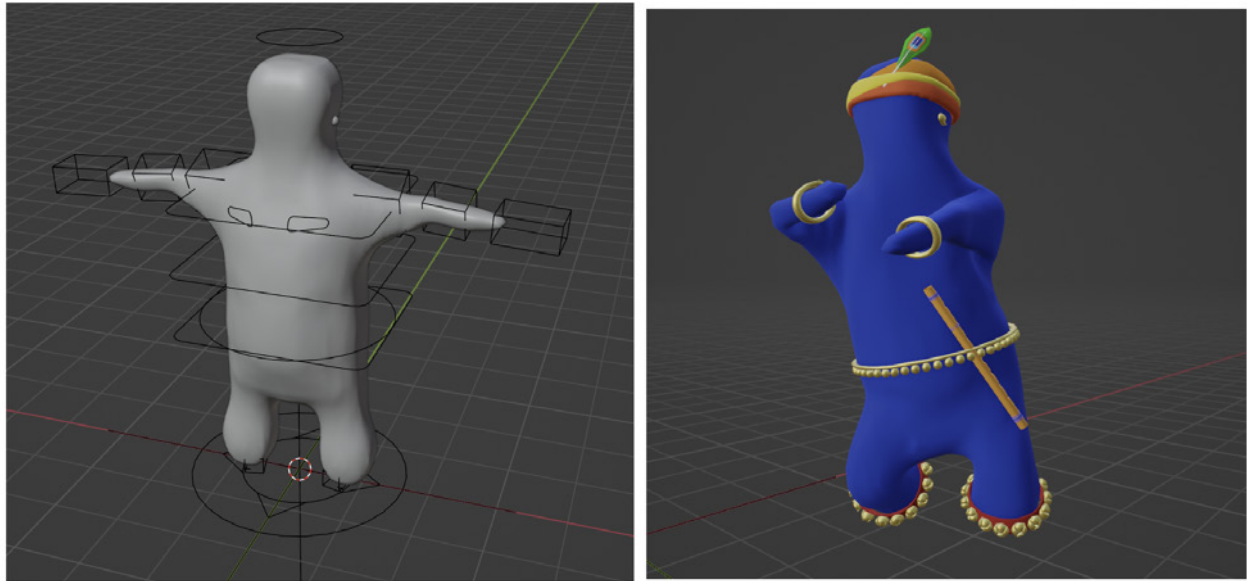


Figure 4.4: Rigged and Ornamented 3D interpretation of Kṛṣṇa for this Project



Figure 4.5: Walkers, 2016 by Antanas Gudonis

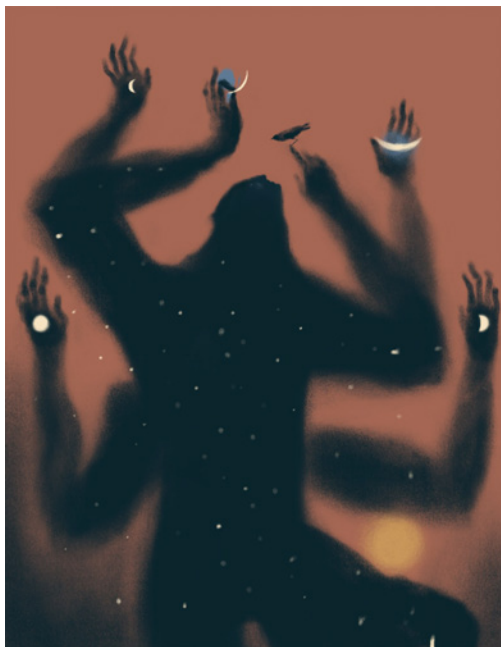


Figure 4.6: What Love Is, 2023 by David Alvarez

simplified, abstracted form of my Kṛṣṇa, with its exaggerated proportions and minimalist features, echoes Alvarez’s style of using scale and abstraction to convey a sense of the divine.

#### 4.4.2 His Successful Cuteness

While creating the model, I subconsciously incorporated elements of “cuteness” as illustrated by Sianne Ngai in her 2022 book “The Cute,” which explores how certain aesthetic qualities evoke feelings of endearment, protection, and affection. According to Ngai, “cuteness” is characterized by features such as roundness, softness, and an appeal to our nurturing instincts [11]. These features are evident in my Kṛṣṇa model through its rounded forms, smooth textures, and childlike proportions. The 3D model leverages these qualities to create a welcoming figure. His abstracted and simplified form, combined with expressive, non-threatening postures, evokes a sense of gentle innocence, making him approachable and endearing, encouraging viewers to connect emotionally.

However, I argue that my Kṛṣṇa is more “darling” than “cute” due to his wise and beloved character, the deep cultural symbolism in his ornamentation, and his significant presence in my personal life. As Anne Ronan, a member of my thesis committee, commented, “I miss him when he is not on the screen,” conveying an intimate and beholding characteristic that elevates him beyond mere “cuteness” to a “darling” figure.

## Kathak - Devotion through Dance

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*Kathak, one of the eight major forms of Indian classical dance, is not only a means of storytelling but also a profound expression of devotion and spirituality. This chapter explores the transformative experience of Kathak, delving into personal experiences, professional insights, workshops, and modern technological integration.*



### 5.1 A Trance State

Dancing fervently often transports me to a trance where I lose sense of space and energy. My limbs move feverishly, in rhythm, thoughtlessly, like a puppet controlled from within. In her 2004 article titled "Dance, Pleasure and Indian Women as Multisensorial Subjects" for the Visual Anthropology Journal, Pallabi Chakravorty outlines her experience as a Kathak student. The spiritual aspect of her experience resonates with my own. She redefines "me," where the brain, eyes, and ears are no longer the source of "me"—instead, it is the limbs that become "me" [12]. She states, "When I say I danced, it wasn't me directing my legs and hands; it was my hands and legs dancing by themselves." Such body movements convey emotions and thoughts beyond words, forming a unique language.

My interview with Kartika Singh, a professional Kathak performer [Fig. 5.1], provided profound insights into this trance-like state. Kartika emphasized that devotion is subjective and an intrinsic state of mind, not easily triggered by external factors. She explained that she often loses herself in dance without needing music, due to her deep connection with the art form cultivated over years of practice. This reflects the joy that comes from within, a palpable feeling that transcends the physical. Kartika highlighted that perfect movement is not necessarily spiritual; instead, the true essence of Kathak lies in merging the physical form with the soul. She views Kathak as a form of escapism, where the beauty lies in embracing the lack of control experienced during a trance



Figure 5.1: Kartika Singh - Professional Kathak Performer, 2020

state. This conversation deepened my understanding of Kathak, reinforcing that the dance is not just a series of movements but a profound expression of inner devotion and joy.

## 5.2 Gopi - The Epitome of a Devotee

Students of Indian classical dance and music spend a large portion of their lives in "Riaz," which translates to "practice." The Urdu word "Riaz" embodies notions of abstinence, devotion, discipline, and hard labor, akin to worship [12]. Kathak was shaped during the Bhakti Movement in the 18th century as a medium of worship and devotion to Kṛṣṇa. Performers embody the role of a "Gopi" (a cowherdess) and dance passionately for Kṛṣṇa. Ras-lila is a popular practice in Kṛṣṇa's tales where he plays his melodious flute in Vṛndāvana, charming all the Gopis to run to him. He then manifests multiple copies of himself, one for each Gopi, so each feels she has the whole of Kṛṣṇa to herself, and they dance till eternity [Fig. 5.2].

Literally, "Rasa" describes the act of tasting food. Poetically, it symbolizes the fusion of the spectator and the performer, the observer and the observed, the devotee and the deity [12]. Devotees of the Bhakti movement claimed dancing and singing as the path to communion with Kṛṣṇa. Culturally initiated devoted dancing can ascend the participant to higher realms, as recalled by Chakravorty: "Slowly my body responds by moving my arms in vague remembrance...The mundane classroom with its everyday objects...recedes from my consciousness as the room transforms into the magical green pastures of Brindavan...I visualize Kṛṣṇa dallying with the Gopis, playing the flute, dancing with Radha. A sense of celebration, festivity, and nostalgic pleasure engulfs me as I engage in rapturous dancing like Radha."



Figure 5.2: Painting of Ras-lila - captured during research in Mathura, India (Dec, 2023)

### **5.3 Darśana participant’s Role as a Gopi**

The participants in my installation were informed about the nature of a Gopi and asked to embody one during their interaction with the piece, as illustrated in the script of the two-minute introduction at the beginning of the experience (presented in Chapter 8). Embodying the role of a Gopi presented the participant from any cultural background with an opportunity to temporarily wear the shoes of a Hindu devotee. Similar to how actors can become fictive policemen, doctors, and anything else in the world temporarily by simply embodying the role of one, a participant could temporarily become a fictive Hindu by embodying the role of a Gopi.

This self-contained enactment allows them to engage deeply with and experience a foreign culture firsthand. By embodying the role of a Gopi, participants are not merely observing a cultural tradition from a distance but are actively participating in it. The participants’ embodiment of a Gopi completes the experience as an act within the Hindu mythological tale of Rasa-lila. In this context, there is no external audience; the participants themselves become both the performers and the observers. It is a truly immersive experience. Aiding haptic and aural immersion into the role of a Gopi, the participants were offered ankle bells to wear on their feet during the interaction [Fig. 5.3].



Figure 5.3: Participants wearing Ghuṅgarū (Ankle Bells) prior to the interaction



Figure 5.4: Ankle Bells to be worn by participants, placed at the entrance

## 5.4 Ghuṅgarū - Ankle Bells

Ghuṅgarū, or ankle bells [Fig. 5.4], are an integral part of Kathak dance, enhancing both the visual and auditory experience of the performance. These small metallic bells are strung together and worn around the ankles, producing rhythmic sounds that synchronize with the dancer's movements. The use of Ghuṅgarū in Kathak serves multiple purposes: it emphasizes the intricate footwork characteristic of the dance, adds a percussive layer to the performance, and helps the dancer maintain rhythm and tempo. The resonant jingling of the bells deepens the dancer's immersion into the role, creating a multisensory connection between the performer and the divine. This auditory feedback not only aids in achieving a trance-like state but also symbolizes the dancer's devotion and connection to the spiritual essence of the dance. By wearing Ghuṅgarū, participants in the Darśana installation can more fully embody the role of a Gopi, enhancing their experience of the cultural and spiritual dimensions of Kathak.

## 5.5 Kathak Posture Workshop

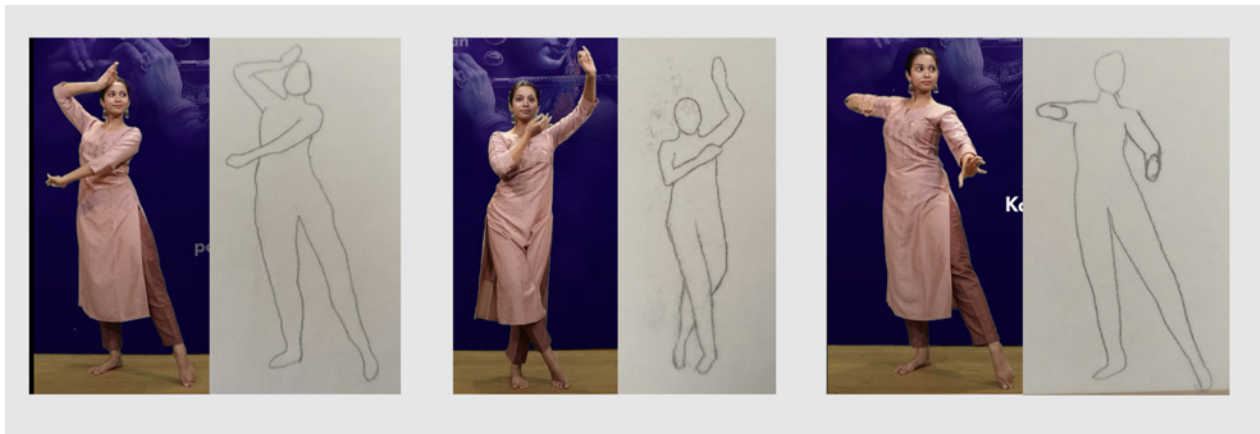


Figure 5.5: Traced Kathak Poses depicting Kṛṣṇa from SIFF Kathak Artiste [13]

In October 2023, during the pre-production phase of my project, I organized a workshop to explore various Kathak poses and understand participants' experiences. I drew frames with silhouettes of 14 different Kathak poses [Fig. 5.5], paired them randomly, and stuck them on the wall. Participants were asked to circulate around the room and mimic the poses [Fig. 5.6], marking the ones they liked or disliked. We concluded with a feedback discussion, which revealed the following insights:

1. Some participants felt uncomfortable dancing or moving in a vulnerable manner around others, while some felt motivated and enticed to move more, comparing it to the effect of a disco dance party.



Figure 5.6: Kathak Posture Workshop, Media Annex, Blacksburg (October 2023)

2. Stretching of arms and legs felt meditative and relaxing to some participants, similar to yoga.
3. The silhouettes lacked clear front/back or left/right indications, causing confusion.
4. Random pairing of poses led to some pairs working well for transitions, while others were difficult.
5. Many participants interpreted the paired poses as a loop, preferring a steady series of postures for freer movement.
6. Participants felt more culturally situated and motivated to move with relevant music than without it.
7. Some participants felt that darkness would allow them to move more freely, so we turned off the lights for a while but turned them back on due to visibility issues.

## 5.6 Motion Capture

With the intention to equip the virtual Kṛṣṇa with authentic Kathak postures and intricate movements, I returned to India in December, 2023, and collaborated with Juli Ramjali and Shrishti Praja [Fig. 5.7], students at Siddharth Memorial Charitable Trust in India, who are learning the Indian classical dance form professionally.

To record their dance, I used the Perception Neuron Motion Capture suit [Fig. 5.8], a versatile tool known for its high precision in capturing detailed motion data. Having previously experimented with this suit, I had the opportunity to fine-tune the settings to ensure an error-free



Figure 5.7: Juli Ramjali & Shrishti Praja - Students at Siddharth Memorial Charitable Trust, India



Figure 5.8: Motion Capture of Kathak Students Juli and Shrishti, India (Jan, 2024)

capture. This preparatory work was vital to achieve the highest accuracy in the motion data, reflecting the nuanced movements of Kathak dance.

Once the dance sequences were recorded, I exported the BioVision Hierarchical (.bvh) data files from Neuron Axis Studio, the software used to operate the Perception Neuron suit. These files contained the raw motion capture data, which needed to be processed and adapted for use in my 3D environment.

The next step involved importing these .bvh files into Blender, a powerful open-source 3D creation suite. In Blender, I remapped the animation data onto trial models downloaded from Mixamo, a platform providing high-quality 3D character animations. This process was facilitated by AutoRig Pro, a Blender add-on designed to streamline the rigging and retargeting process. AutoRig Pro allowed for the seamless integration of the motion capture data with the trial models, ensuring that the recorded movements were accurately represented. Finally, I transferred these animations to my 3D model of Kṛṣṇa [Fig. 4.4].

## Vṛndāvana - His Celestial Abode

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*This chapter explores Vṛndāvana as both a physical location and a spiritual realm in Hindu mythology. Known as Kṛṣṇa’s celestial playground, Vṛndāvana is depicted as the “highest heaven.” It delves into the tangible town in Uttar Pradesh and the ethereal Vṛndāvana in the spiritual realm. The chapter also details the creation of a virtual Vṛndāvana using advanced techniques, designed to immerse participants in the serene, divine environment reflecting Kṛṣṇa’s eternal abode.*



### 6.1 The Highest Heaven

Kinsley presents Vṛndāvana as the “highest heaven” and the idyllic town with the perfect residents for Kṛṣṇa to conduct his play [8]. According to Hindu scriptures, there are essentially two Vṛndāvanas. The first Vṛndāvana is a tangible physical town located in the state of Uttar Pradesh, about four hours from the National Capital of India, New Delhi. Kṛṣṇa grew up in this Vṛndāvana, which is filled with temples and locations associated with various tales from his stories. I visited this Vṛndāvana again in December 2023 to record visual references and audio for spatial soundscaping. The town is famous for its delicious foods and sweets sold at every corner, while the traditional Vṛndāvana (pre-commercialization) is famous for its abundant flora and fauna.

### 6.2 A Second Spiritual Vṛndāvana

The second Vṛndāvana exists in the intangible spiritual realm, floating in space, where Kṛṣṇa remains in his youth, playing the flute, and frolicking with the residents of Vṛndāvana for eternity. This spiritual Vṛndāvana, free from traces of industrial development or global warming, is the paradise I wish to immerse the participant in. Several Indian art traditions have depicted this Vṛndāvana. One popular school of Indian art, Pichwai, emerging from Rajasthan (my birthplace),



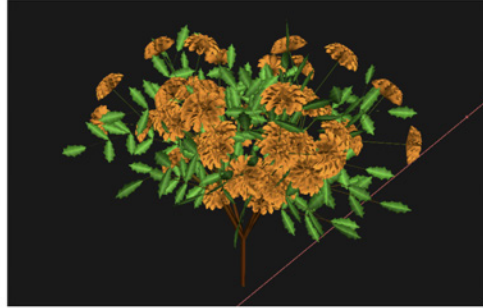
Figure 6.1: Vṛndāvana Pichwai Painting by Manish Soni & Group

is known for its vibrant and intricate depictions. Manish Soni, from a lineage of renowned Pichwai practitioners, has illustrated Vṛndāvana lush with greenery and animals dancing around [Fig. 6.1]. Using these depictions as references, I built a virtual Vṛndāvana in TouchDesigner.

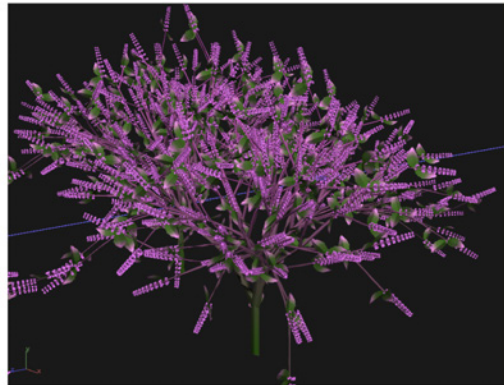
### 6.3 Building the Virtual Vṛndāvana - Procedural Plants with L-Systems

Given the interactive nature of 'darśana' and the interconnected reality of the virtual spiritual realm that I would be transporting the participants to, I chose to generate the flora of the virtual Vṛndāvana procedurally with the purpose of enabling micro-interactivity, while also allowing space for randomness and play. I chose six species of plants that are commonly found on the lands of Vṛndāvana, and/or considered holy in Hindu traditions [14][15]. I chose six because of the graphic processing capacity of my laptop, given how heavy procedural generation is on the hardware of the installation. Here is a list of the plants (Scientific Name, followed by Common Name, followed by Hindi Name) along with their visuals (the real-life plant, followed by the procedurally generated plant):

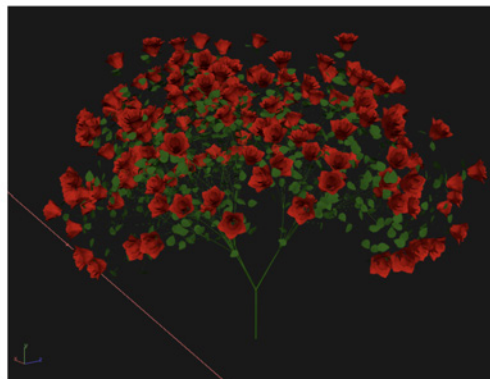
1. *Tagetes* | Marigold | गेंदा (Genda)



2. *Ocimum tenuiflorum* | Holy Basil | तुलसी (Tulsi) | वृन्दा (Vrinda - The origin of *Vṛndāvana*)



3. *Rosa Indica* | Roses | गुलाब (Gulab)



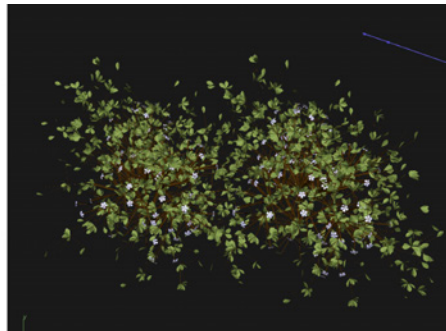
4. *Plumeria* | Temple Tree | चम्पा (Champa)



5. *Cassia fistula* | Golden Shower | अमलतास (Amaltas)



6. *Plumbago auriculata* | Cape Leadwort | नीला चित्रक (Nila Chitrak)



Each plant is instanced 18 times, randomly distributed throughout the points of the landscape,

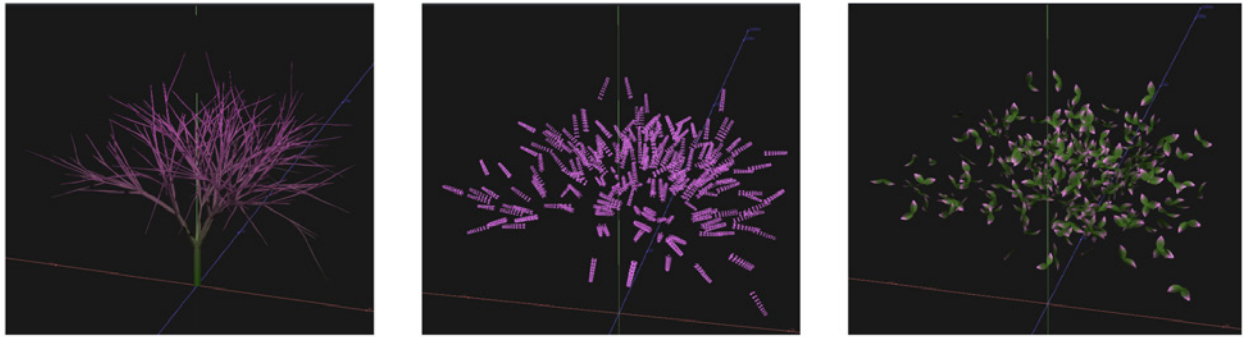


Figure 6.2: Procedurally Generated Parts of Plant: the Stem, the Flowers, and the Leaves



Figure 6.3: Procedurally Generated Leaf of the Holy Basil Plant

with the help of a Python script. Hence, a total of 108 plants form the garden of our virtual Vṛndāvana, making space for auspiciousness to bless my exhibition. Each plant is generated procedurally using L-System CHOP in TouchDesigner, after studying *\*The Algorithmic Beauty of Plants\** by A. Lindenmayer and P. Prusinkiewicz [16]. Because of the scale of this generation, each plant is composed of three elements, generated separately with individual L-Systems, and then combined before instancing: the stem, the flowers, and the leaves [Fig. 6.2].

The individual leaves are generated procedurally as well [Fig. 6.3, 6.4]. Similarly, the individual petals of the flowers are also generated procedurally inside TouchDesigner, and then respectively arranged as per the flower's form [Fig. 6.5, 6.6]. Both instancing and separation are methods that reduce the load on the graphic card of the operating system, in this case, my laptop.

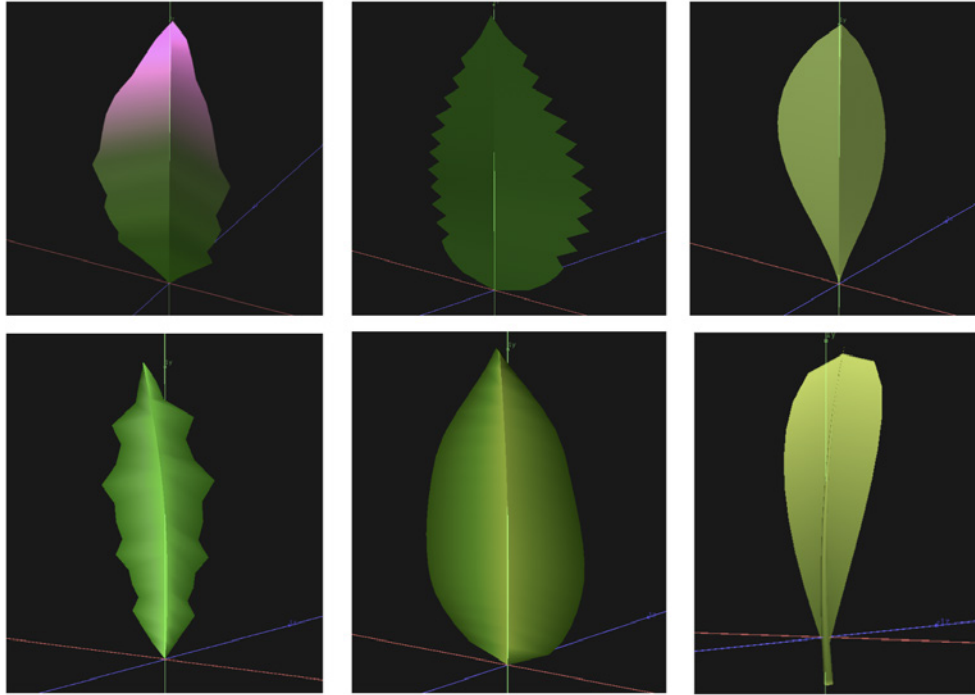


Figure 6.4: Procedurally Generated Leaves of all the Plants

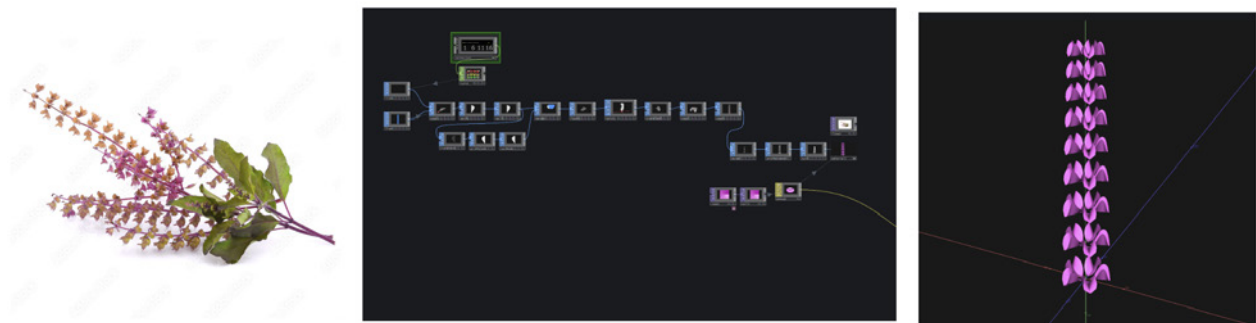


Figure 6.5: Procedurally Generated Flower of the Holy Basil Plant

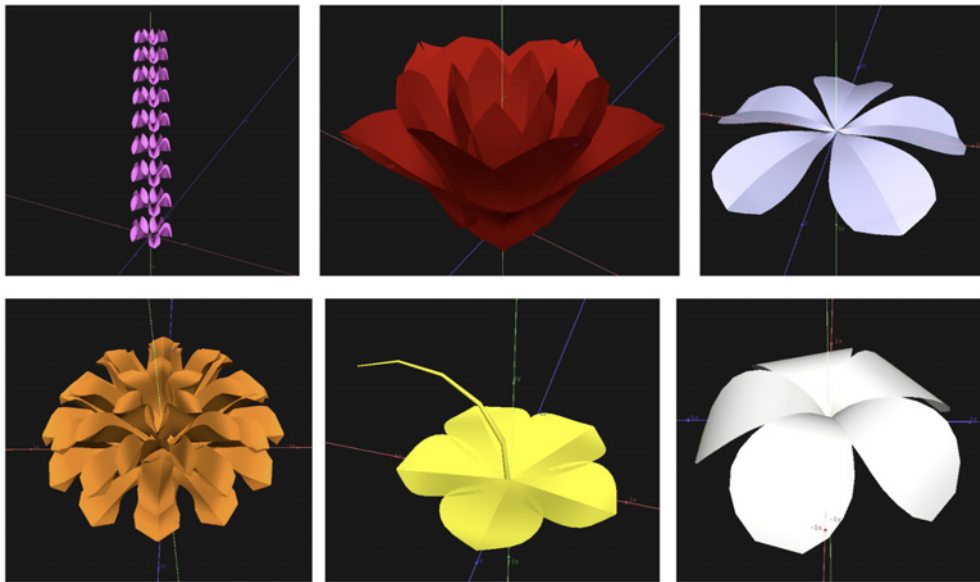


Figure 6.6: Procedurally Generated Flowers of all the Plants

## 'darśana' - To Receive Blessing

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*This chapter explains 'darśana,' the act of seeing the divine in Hinduism, as an interactive and mystical experience. It details the project's aim to recreate this spiritual practice using new media technologies to engage multiple senses. The chapter concludes with the creation of a virtual temple inspired by Indian architecture, reflecting Lord Kṛṣṇa's life and legacy.*



### 7.1 An Interactive Act

Literally, 'darśana' translates to "sight," "visit," or "philosophy." However, in the Hindu context, it refers to the act of religious seeing or the visual perception of the sacred, where beholding the sight of the divine is equivalent to receiving a blessing from the divine [4]. Hindus do not say "I visited the temple to worship," they say "I visited the temple to receive 'darśana'." Large crowds of Hindus gather at thousands of temples across the world to receive 'darśana' from idols of 33 million different deities, including Lords Rama, Shiva, Kṛṣṇa, Ganesha, and Durga. In this image, a crowd waits for the priests to draw the curtain and reveal the idol of Lord Kṛṣṇa at the Banke Bihari Temple in his hometown, Vṛndāvana, Uttar Pradesh, India [Fig. 7.1]. They wait for the simple interaction of beholding the sight of and being seen by the idol.

'darśana' is an interactive act. The devotee receives 'darśana' as the deity gives it. In common practice, this exchange is initiated by the devotee when visiting a temple or a sacred place. However, a deeper and amplified version of 'darśana' exists, initiated by the deity. This rare, involuntary, individual, and overwhelming experience can manifest in various ways. I was fortunate to get on multiple virtual calls with Dr. Samanta to discuss this phenomenon.

Dr. Suchitra Samanta is a retired Virginia Tech faculty member from Kolkata, India. A part of her research focuses on Hindu mythology and related religious experiences. She published a book titled "Kali in Bengali Lives: Narratives of Religious Experience" in 2021, in which she interviews individuals who have had spiritual experiences of 'darśana' from Kali, a popular Hindu deity. Her



Figure 7.1: Crowd waits for the curtain to reveal Lord Kṛṣṇa's idol at Banke Bihari Temple, Vrindavan, India [17]

interviewees described these experiences as "precognitive dreams, mobile lights with no obvious source, inexplicable human manifestations where people were agents of divine will, and more" [5]. This idea speaks to the Vedic concept of 'darśana' as a "mystical, supernatural beholding" or "visionary experience" [4].

David R. Kinsley, in his 1975 study of Kali and Kṛṣṇa, "The Sword and the Flute," defines these visions as a device that enables individuals to see beyond the immediately sensed world of bits and pieces, allowing them to perceive a larger cosmos [8].

## 7.2 Implementation of 'darśana' in Darśana

This perception of 'darśana' as a medium to experience the interconnected nature of the Hindu worldview inspired me to incorporate the phasing in and out effect in the virtual world I designed for Darśana. This effect allows participants to feel as if they are entering a separate realm where everything is interconnected. Their actions impact the growth of the plants and draw the attention of Kṛṣṇa.

When participants enter the physical installation, they are gradually immersed into a blue sphere with the help of 360 degree projection mapping. The blue sphere represents Goloka, the spiritual realm of Kṛṣṇa, where the ordinary laws of this world do not apply [Fig. 7.2]. The

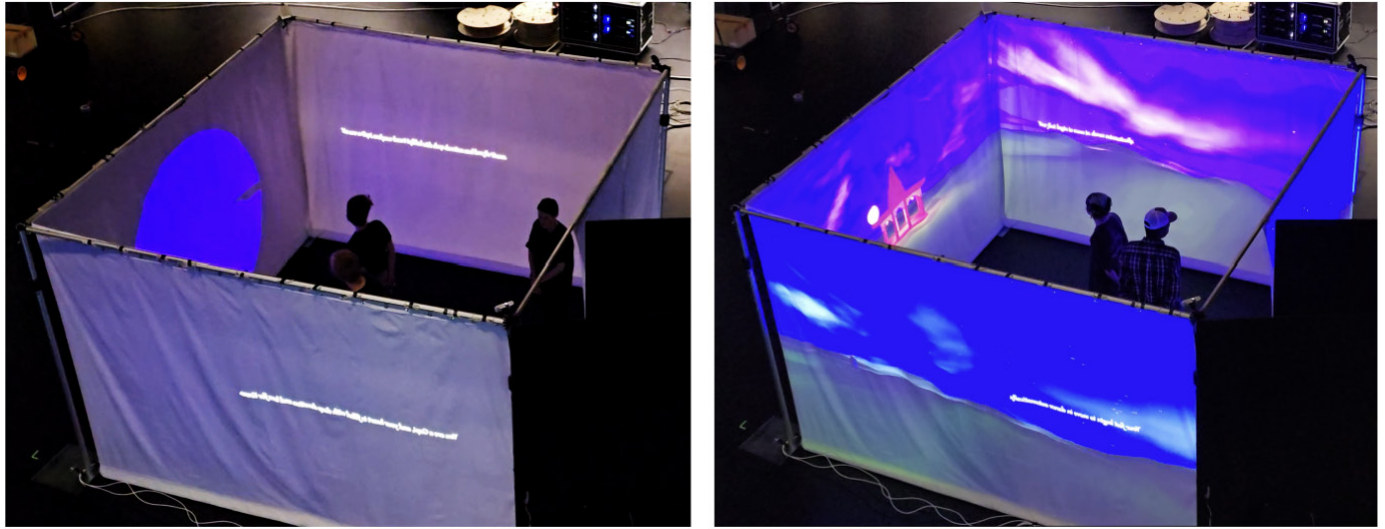


Figure 7.2: Participants are transported to Goloka, Kṛṣṇa’s spiritual realm

spiritual Vṛndāvana, discussed in Chapter 6, is synonymous with Goloka, an eternal, spiritual realm that never ages. Participants are removed from their reality and transported into this realm to experience its interconnected nature, and similarly transported out of it at the end of the experience. This temporary visit to the Hindu spiritual realm presents them with an opportunity to understand the interconnected Hindu perspective of the world.

## 7.3 Planning The Interactivity

Kathak is one of the eight Indian Classical Dance Forms, emerging during the Bhakti Movement in India as a form of devotion to Kṛṣṇa. Its significance in devotion and storytelling is discussed in detail in Chapter 5. Building on this discussion, dancing and Kathak became the backbone of interactivity for this experience. To explore its potential as a medium of interactivity, both thematically and technically, I conducted a movement workshop. This workshop aimed to understand how effectively Kathak could engage participants and enhance the immersive experience.

### 7.3.1 Interactive Visuals Workshop

I set up an initial draft of the interactivity with digitally displayed Kathak postures, inviting my fellow MFA Creative Technologies students to participate. Participants were asked to mimic the postures, recorded with a webcam, which revealed art in the background through their silhouettes [Fig. 7.3]. Life-size projections of these visuals were displayed for real-time interaction, allowing participants to engage with the Kathak postures. The feedback was as follows:



Figure 7.3: Interactive Visuals Workshop, November 2023

1. The experience reminded many of an arcade game where mimicking poses advances levels.
2. Visuals with smaller, identifiable content within the silhouette worked better than larger, more abstract art pieces.
3. Larger, intricate art pieces encouraged participants to move around and explore the full artwork, while patterns lacked sufficient motivation for exploration.
4. The combination of posture outlines, participant silhouettes, and colorful, intricate background art did not create a cohesive aesthetic.
5. Postures displayed in the same screen location made participants feel stationary.

The primary takeaway from this workshop was that asking participants to mimic poses gamified the experience too much, detracting from its spiritual and devotional aspects. Consequently, I decided to move away from the mimicry-based interactivity and allow for free, undirected movement within the space. However, the idea of visuals being revealed more as participants moved was a good motivation for continued movement. To retain engagement, I decided that the six plant species (discussed in Chapter 6) would be revealed one by one over a period of continued movement. This approach maintained the participants' engagement while enhancing the spiritual and immersive nature of the experience.

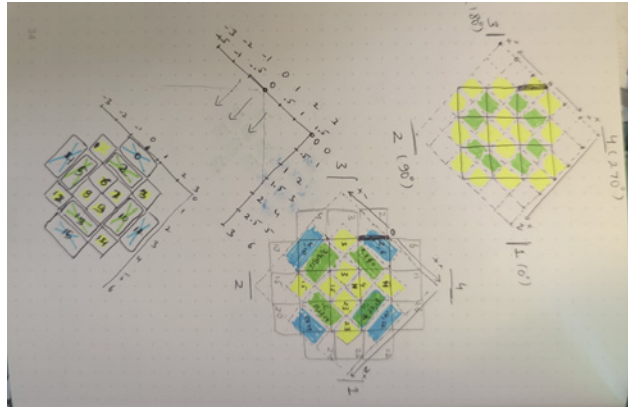


Figure 7.4: Interactive Zone Plan based on Kinect Azure placement

### 7.3.2 Collective Movement-based Devotion

I experimented with various possibilities in TouchDesigner, including audio and movement reactive Stable Diffusion, particlesGPU, and Body Tracking. One of my favored ideas was to make the visuals interactive based on the participant's location. Thus, I devised an interactivity zone setup, experimenting with player recognition data from Azure Kinect to plan location-based interactivity [Fig. 7.4]. I created zones of interactivity in the installation space and mapped those zones to specific areas inside the 3D world for visual feedback.

However, this would mean only one person would be able to experience it at a time. Reflecting on my learnings, I recalled that "darśana" and Hindu practices are a collective experience in general. Hence discarding the zone-based interactivity, I designed the interactivity so that multiple people could experience it at the same time. Instead, each plant species would grow and be revealed gradually over continued interaction. Additionally, the 3D model of Kṛṣṇa would come closer to the temple in the virtual space when the user moved and move away when the user stopped moving. This characteristic of Kṛṣṇa resonated with his playful and teasing nature, as discussed in Chapter 4, and enticed the user to keep moving.

## 7.4 Building The Virtual Temple

This project aims to explore the idea of 'darśana' by defining it as "an interaction with the deity" such that in order to be seen by, get the attention of, and receive a blessing from a deity, one must make a conscious effort to devote themselves to the deity. To enable this experience, the plants and Kṛṣṇa in the virtual world react to the participants' movements.

The experience of 'darśana' usually takes place at the site of a temple. I, along with my family, have been part of a crowd similar to Fig. 7.1 hundreds of times. After delving into Henry Wilson's 2011 collection, "Patterns and Ornaments in the Art of India," I was inspired to visit various

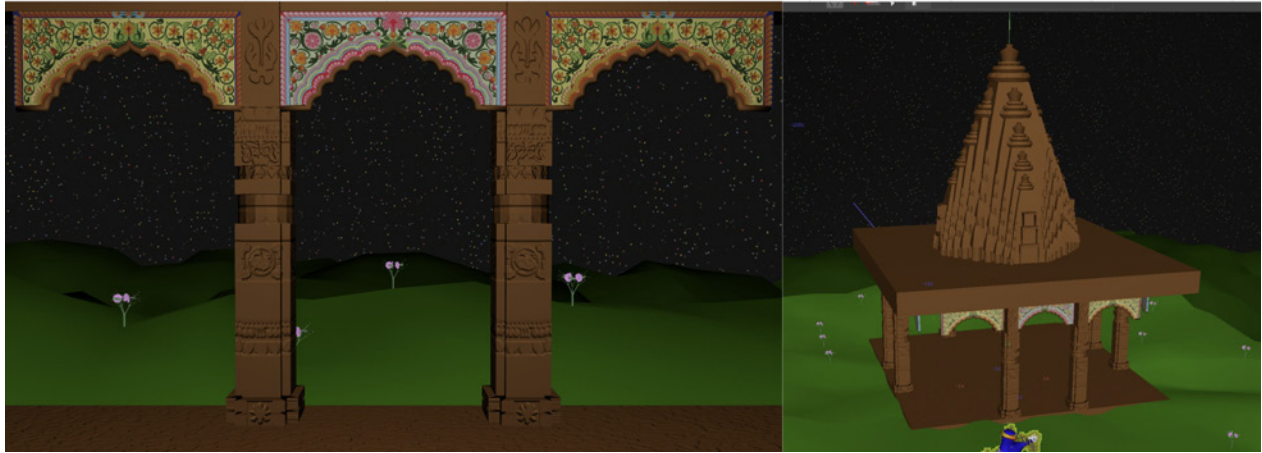


Figure 7.5: Virtually constructed Temple in TouchDesigner

temples across India to experience these architectural marvels firsthand.

In January 2024, while still in India, I traveled to religious locations associated with Lord Kṛṣṇa and collected aural and visual references. Patterns and motifs are not just decorative elements but are imbued with cultural and spiritual significance [18]. My on-site explorations in India allowed me to incorporate a wide array of motifs and patterns into my virtual temple [Fig. 7.5], each chosen to reflect Lord Kṛṣṇa's life and legacy.

The Shikhar (dome) of the temple was inspired by the dome of the Dwarkadhish Temple in the town of Dwarka, in Gujarat, India [Fig. 7.6]. This town is said to have been established by Lord Kṛṣṇa himself.

The columns were inspired by a rather unusual temple in the village of Mahabaan, Uttar Pradesh, India. It is said to be the original Vṛndāvana, but very little of any ancient references to the history of Lord Kṛṣṇa remain there. One of these is the Chaurasi Khamba (Eighty Four Pillars) Temple, with an open roof, more than 84 pillars, and interestingly no idol [Fig. 7.7]. This is the place that gave me the idea of an immersive pillared temple. Each pillar is adorned with different intricate carvings, mostly referring to natural elements associated with Lord Kṛṣṇa like flowers, leaves, peacocks, etc. It is believed that Lord Kṛṣṇa hosted the Maharas (the ultimate dance of love) at this temple.

The arches are inspired by and mimic the arches of one of the most beautifully adorned temples I have ever visited in my life: The Dwarkadhish Temple, Mathura, Uttar Pradesh, India [Fig. 7.8]. Each arch had a distinct pattern and color palette. The entire temple was covered with these patterns. My virtual temple aims to capture this same level of intricate beauty and spiritual ambiance, creating a maximalist space that honors the traditional Indian architectural style and its rich cultural heritage.

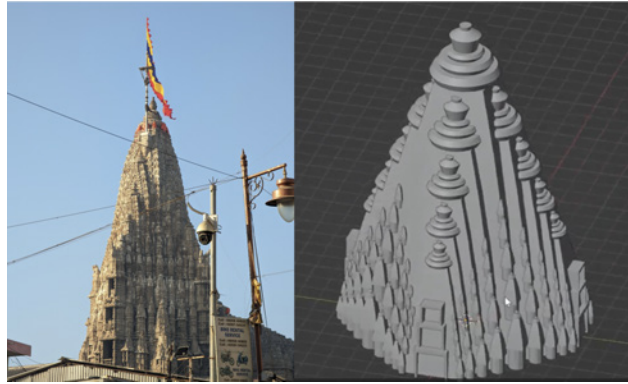


Figure 7.6: Dome of the Dwarkadhish Temple, Dwarka, Gujarat, India



Figure 7.7: Chaurasi Khamba Temple at Mahabaan, Uttar Pradesh, India and its Pillar Art

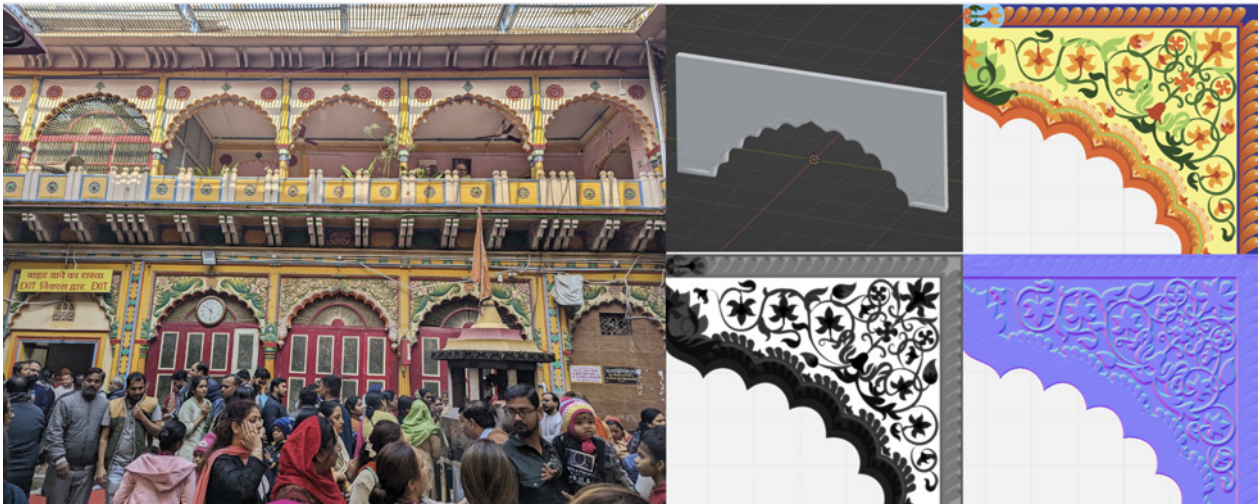


Figure 7.8: Interiors of Dwarkadhish Temple at Mathura, Uttar Pradesh, India and its Arch Art

## The Experience - Final Installation

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*The final experience was installed in the Cube at the Moss Arts Center on May 1st, 2024. It was open to the public on May 2nd and 3rd from 10 am to 5 pm. A reception was held on May 2nd from 3 pm to 5 pm at the Mezzanine in the Armory Building. I defended my thesis on May 3rd, 2024, at 12 PM in the CID Building. I thank Shivani, Advait, and Rushi for helping me install the final exhibition. It wouldn't have been possible without them.*



### 8.1 User Journey

After finalizing the screen placement, I detailed the user journey, which is described as follows (also outlined in the preamble):

A participant enters the Moss Arts Center and is welcomed by me or an usher, who hands them a brochure containing contextual and practical details about the experience. This brochure is intended to be read while they wait for their turn. When the exhibition becomes available, I or the usher escort them into a small, intimate room with two benches. The user is asked to sit on the benches while we briefly introduce the experience, explaining that it is interactive and that they are encouraged to move or dance around the space to activate the visuals. We ask them to remove their footwear if they are comfortable doing so and offer them ankle bells to wear.

Once ready, participants are invited to enter the "virtual temple" at their own pace. The experience is motion-activated and begins as soon as they step into the temple. The first two minutes provide an introduction to Kṛṣṇa and the participant's role in the experience, followed by six minutes of interactive engagement.

During the introduction, participants are gradually transported, both visually and aurally, into the virtual Goloka, Kṛṣṇa's spiritual realm. Initially, the space is devoid of plants, with Kṛṣṇa dancing alone in the distance. Over the next five minutes, as participants move around and interact with the environment, six species of plants gradually grow. In the final minute, during



Figure 8.1: Camera leaving the virtual realm, with fully grown plants

the crescendo of the soundscape, participants are transported out of the virtual Goloka. Through their devotion to Kṛṣṇa, they leave the place enriched, with fully grown plants [Fig. 8.1].

When the visuals fade to black and the sound stops, it signals the end of the session. Participants then remove the ankle bells, put on their footwear, and exit the Cube.

## 8.2 Soundscape

### 8.2.1 Ambisonic Recordings

I traveled to three locations associated with Kṛṣṇa in India to capture authentic sounds:

1. Vrindavan, Uttar Pradesh, India - Hometown of Kṛṣṇa
2. Mathura, Uttar Pradesh, India - Birthplace of Kṛṣṇa
3. Dwarka, Gujarat, India - City established by Kṛṣṇa

Each location has multiple temples devoted to Kṛṣṇa. I visited several of them and recorded ambisonic sounds of the devotees and the street ambiance using a Zoom H3-vR ambisonic handy

microphone recorder. These recordings provided a rich auditory landscape that enhanced the immersive quality of the installation.

## 8.2.2 Introduction - Voice Actor

In April 2024, I collaborated with Parth Bapat, an M.Eng. in Computer Science student at Virginia Tech and a professional Indian singer. He wrote and narrated a two-minute introduction under my direction, recorded on Zoom for spatialized emphasis. The introduction, delivered in Hindi with English subtitles, introduced participants to Kṛṣṇa and the Gopis from a devotee's perspective, inviting them to embody a Gopi during the experience.

### Hindi Script

कृष्ण, हिंदू धर्म के सबसे प्रिय और पूजनीय देवताओं में से एक हैं। वृंदावन की गोपियों के संग रासलीला करने वाले, समग्र संसार में धर्म की स्थापना करने वाले, श्री कृष्ण का चरित्र अनेक रंगों एवं पहलुओं से भरपूर है। आइए आज उसी एक पहलू का अनुभव करें। एक ऐसे वृंदावन की कल्पना करें जो शाश्वत है। अब भी कहीं अस्तित्व में है, जहां समय सदैव युवा और अमर है। आप एक गोपी हैं, और आपके हृदय में कृष्ण के लिए गहरी भक्ति और प्रेम बसा है। आप अपनी आंखें मूंद लेती हैं और अपना मन, अपनी आत्मा कृष्ण को समर्पित कर देती हैं। आपके पैर स्वतः ही नृत्य में बढ़ने लगते हैं। इस समर्पण के नृत्य में आप कृष्ण को अपने और निकट लाने के लिए पूरी तरह से सजग हैं। पांच मिनट का यह अनुभव आपको एक अलौकिक संसार में ले जाता है, जहां आपका हर नृत्य कदम, हर स्वर और हर सांस श्री कृष्ण के प्रेम में विलीन हो जाती है।

### English Subtitles

Kṛṣṇa, one of the most beloved and revered deities in Hinduism, engages in Raas Leela with the Gopis of Vṛndāvana and establishes righteousness across the world. His character is rich with numerous hues and facets. Let us delve into one such facet today. Imagine a Vṛndāvana that is eternal. It still exists somewhere, timeless and forever youthful. You are a Gopi, and your heart is filled with deep devotion and love for Kṛṣṇa. You close your eyes and surrender your mind and soul to Kṛṣṇa. Your feet begin to move in dance automatically. In this dance of surrender, you are fully aware, bringing Kṛṣṇa closer to you. This five-minute experience transports you to a mystical realm, where every dance step, every note, and every breath merges into the love of Shri Kṛṣṇa.

## 8.2.3 Stock Audio

To complete the soundscape, I sourced open-source sounds from the internet, including flute, tabla, sitar, peacock, cow, monkey, bird, and other natural sounds. These sounds enriched the auditory experience, creating a vibrant and immersive environment.

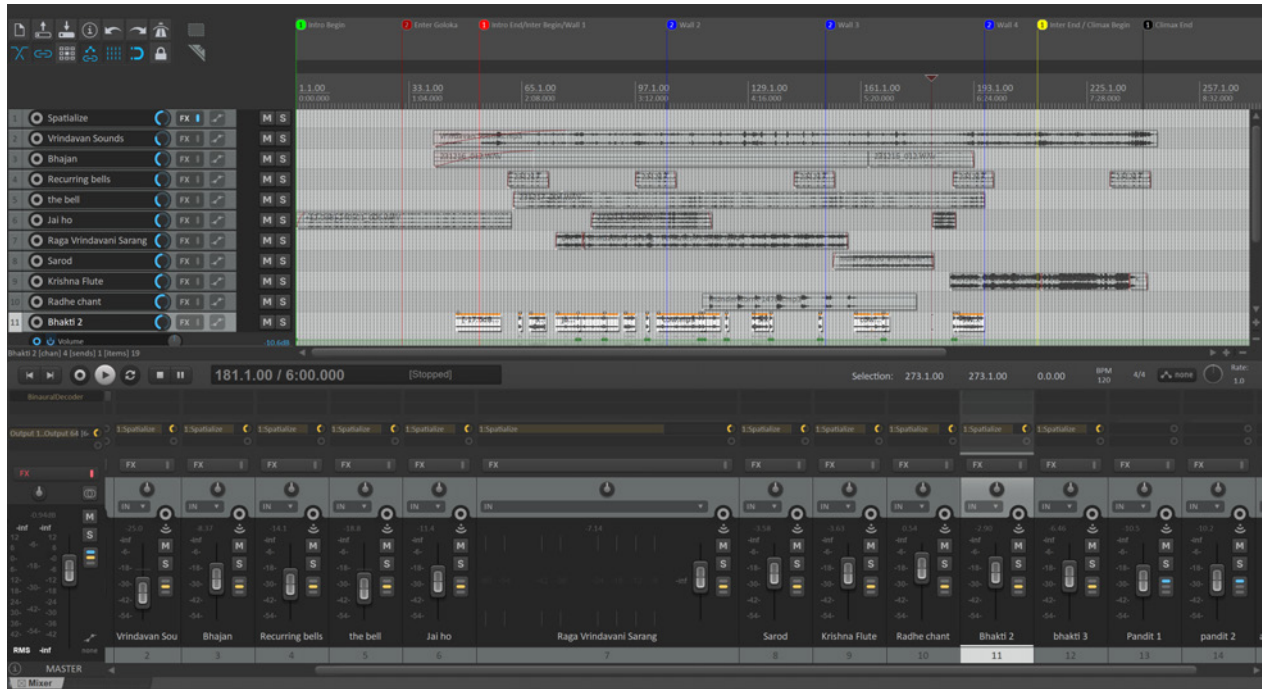


Figure 8.2: Layered Audio Tracks in Reaper Software, spatialized with IEM Plug-in

## 8.2.4 Reaper - Layering and Spatializing

I layered all the sounds together to create an eight-minute composition for the experience using Reaper [Fig. 8.2]. The composition was then spatialized using Max in the Cube, ensuring the sound moved naturally around the space, mimicking the environment of Vṛndāvana.

## 8.3 Screen Layout

I explored several possible screen setups before finalizing the design [Fig. 8.3]. Using a professionally scaled 3D model of the Cube from ICAT, I accurately referenced screen sizes and placements in Blender [Fig. 8.4]. I worked closely with the ICAT team, holding several meetings to ensure the plan was feasible with the available resources and practical for installation.

## 8.4 Draft Experience

A draft experience was installed on March 21st, 2024 [Fig. 8.5]. MFA Creative Technologies students and professors were invited to test and provide feedback. The feedback included the following points:

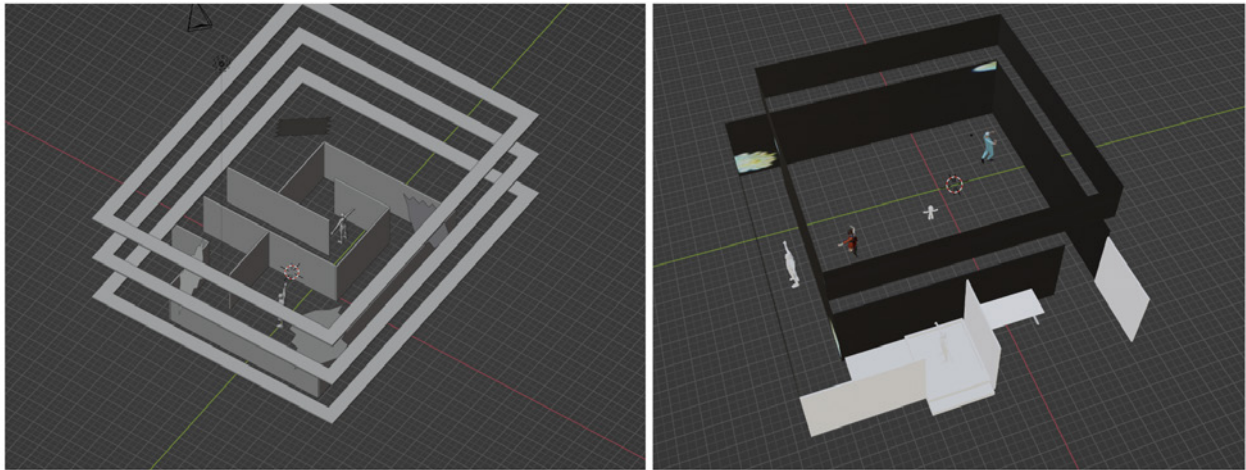


Figure 8.3: Screen Setup and User Journey Ideation

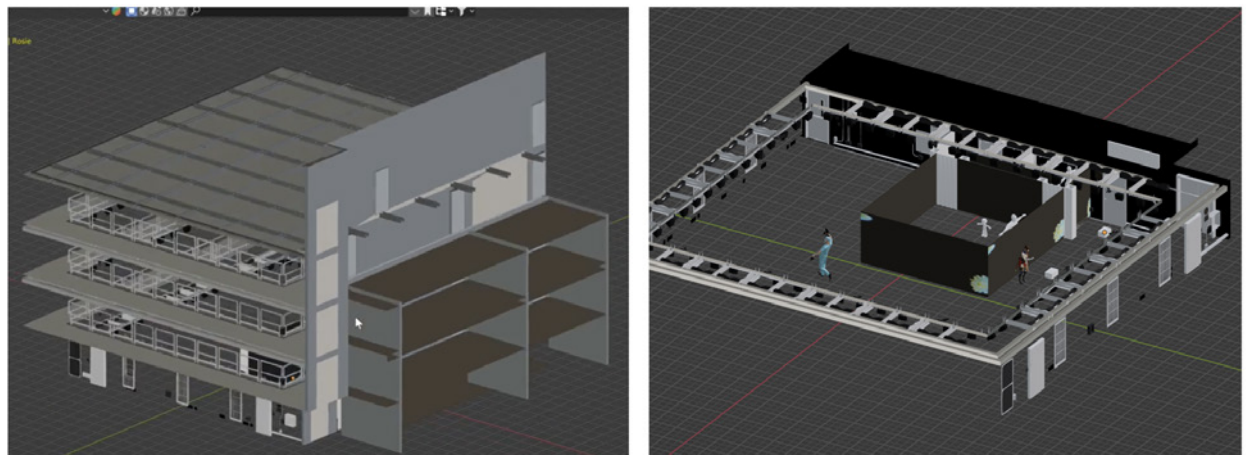


Figure 8.4: Final Screen Setup Plan inside a Scaled 3D Model of the Cube



Figure 8.5: Shivani Sakri interacting with a Draft Installation in March, 2024

1. Increase the floor-space in front of pillars in the projection.
2. Stretch the projection to the bottom of the screen.
3. Make the art on the pillars relevant to Kṛṣṇa.
4. Shorten the experience to 5-6 minutes (from the initial 15 minutes).
5. Some parts of the soundscape worked well, while others needed improvement.
6. Participants wanted some non-interactive time to just observe.

## 8.5 Marketing

### 8.5.1 Brochure

A comprehensive brochure was created to be handed out to participants as they waited to enter the experience. This brochure included a disclaimer, a brief overview of the exhibition, the user

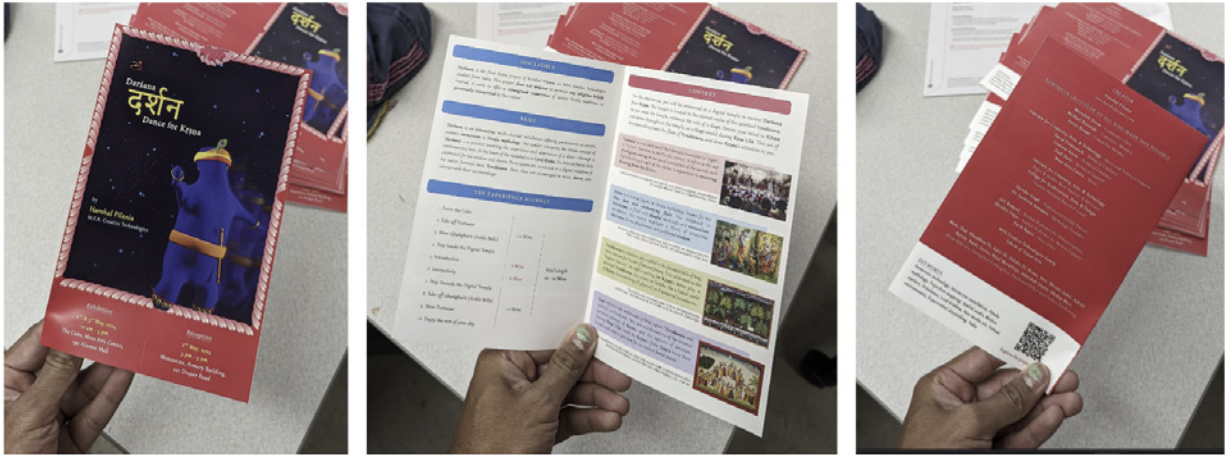


Figure 8.6: Brochure for waiting participants

journey, explanations of important contextual terminology, and acknowledgements. The aim was to provide participants with background information and enhance their understanding and engagement with the installation [Fig. 8.6].

### 8.5.2 Poster

I designed the show poster using Photoshop, which was printed and displayed across the campus and digitally on Moss Arts Center screens. This poster provided essential details about the exhibition, including the dates, location, and a brief description to attract and inform potential visitors [Fig. 8.7].

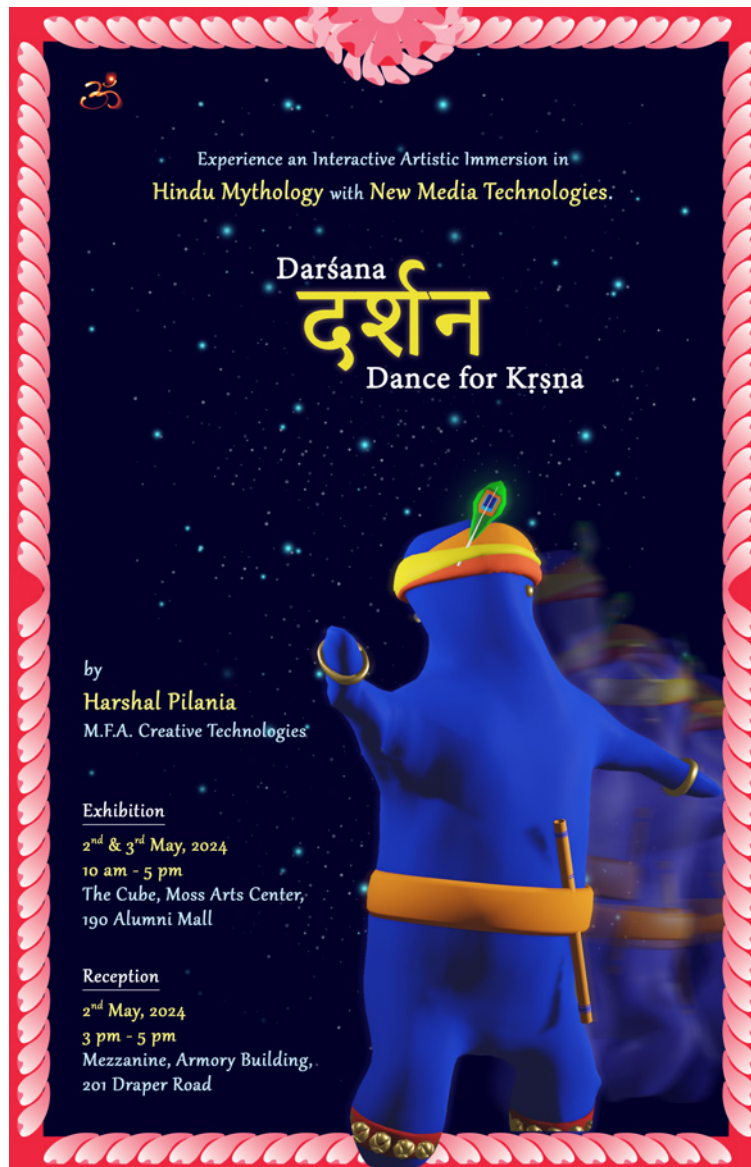


Figure 8.7: Exhibition Poster Design

## Technologies

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*As illustrated in the first chapter, this project was partly inspired by my love for learning and implementing novel technologies. Neither the vision nor the implementation would have been possible at any other place or time in my life. I owe it in part to this program—the MFA in Creative Technologies—and in part to my assistantship at Virginia Tech’s Institute for Creativity, Arts, Technology, which provided the right technical guidance and resources. I also thank ICAT for the Roger Debbie West Student Grant, and Virginia Tech’s College of Architecture, Arts, Design, for the Student Initiated Research Grant, which made it possible for me to afford many of the technologies and software used in this project.*



### 9.1 World-building with TouchDesigner

All the individual elements—Kṛṣṇa, plants, landscape, temple architecture, stars, clouds, moon, and the blue spiritual realm—were generated and combined in a 3D world inside TouchDesigner using multiple GPU COMPs [Fig. 9.1]. TouchDesigner utilizes six different types of operator nodes: COMPs (Components), SOPs (Surfaces), TOPs (Textures), CHOPs (Channels), DATs (Data), and MATs (Materials). Each played a crucial role in creating the immersive environment.

The GPU COMPs, along with Light COMPs, were rendered through four pairs of Camera COMPs and Render TOPs—one for each screen. These renders were then sent out to four NDI (Network Device Interface) feeds, allowing for the seamless transmission of the visual data to the projection setup.

### 9.2 Networking

The installation functioned through a sophisticated web of technological integration, ensuring a seamless experience for the participants. Here’s how it worked:

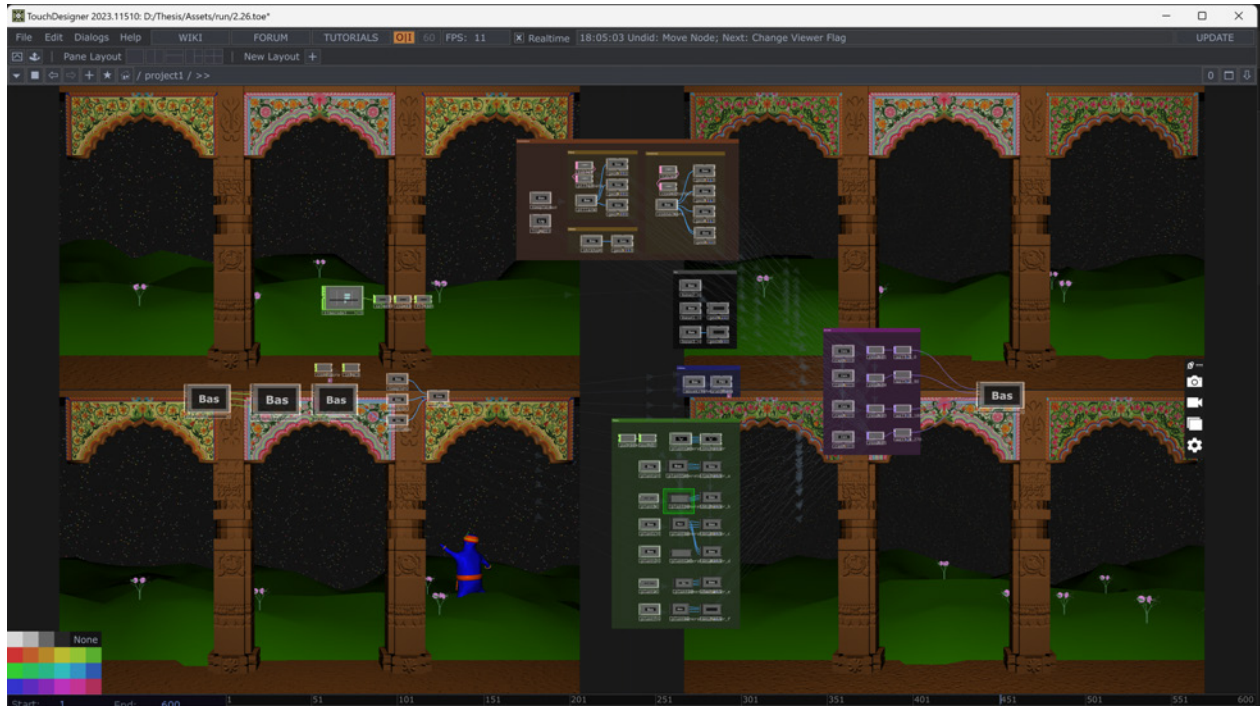


Figure 9.1: Interactive Worldbuilding with Nodes in TouchDesigner

Two Microsoft Azure Kinects were strategically placed [Fig. 9.2] to record participant movements within the physical screen setup using their depth sensors. The data captured by these sensors was transmitted via USB-C cables to TouchDesigner running on my laptop, an Asus ProArt Studiobook 16 [Fig. 9.3]. This setup allowed me to monitor and analyze each group's or individual's interactive journey in real time, providing the capability to adjust the intensity of interactive feedback as needed.

Upon detecting initial motion, TouchDesigner would automatically cue the appropriate visuals within the software. Additionally, it sent a binary cue to Max software on the local computer inside the Cube, which then distributed spatialized audio through the 180 speakers permanently installed around the space. This coordinated effort between TouchDesigner and Max ensured that both visual and auditory elements were perfectly synchronized.

TouchDesigner also transmitted four NDI feeds through Ethernet cables to four separate laptops, each corresponding to one of the projection walls. These laptops received the NDI feed and forwarded it to their respective projectors via HDMI cables [Fig. 9.4]. Everything combined to create a cohesive and enveloping environment for the participants.



Figure 9.2: Azure Kinect setup with Gorilla Pods



Figure 9.3: Live Feed of Kinect Data on my Laptop, Backstage

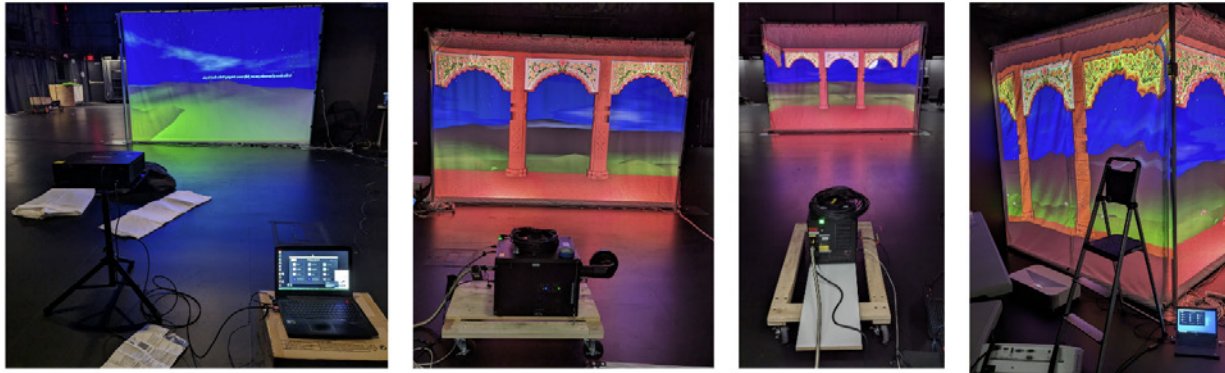


Figure 9.4: 4 Projector Setup in Clockwise Order

## 9.3 List of Hardware Software

### 9.3.1 List of Hardware

1. Perception Neuron Motion Capture Suit
2. Zoom H3-VR Ambisonic Mic
3. 4 X Projection Walls (3 X 12ft by 7ft, 1 X 8ft by 7ft) [Fig. 9.4]
4. 4 X Projectors (Minimum 6000 Lumens each) [Fig. 9.4]
5. 2 X Microsoft Azure Kinects with Gorilla Pods [Fig. 9.2]
6. 7ft tall Black Occlusion Boards
7. 4 X Pairs of Ankle Bells [Fig. 5.4]
8. Electric Fragrance Diffuser with Sandalwood Essential Oil
9. A variety of cables (HDMI, Ethernet, USB C, Power-IEC, Extension, etc.)
10. 2 X 20-inch tall benches
11. 4 X Basic Laptops for NDI
12. Asus ProArt Studiobook 16
13. Network Switch
14. Steamer for removing screen wrinkles

### 9.3.2 List of Software

1. TouchDesigner
2. Blender with Auto Rig Pro Plugin
3. Axis Neuron Studio
4. Reaper
5. Max
6. Mixamo
7. Notion
8. Miro
9. Zotero
10. Overleaf
11. Adobe Illustrator
12. Adobe Photoshop
13. Network Device Interface (NDI Suite)

## Conclusion

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*Darśana fosters a playful fusion of Hindu traditional practices with new media technologies to:*

- *Contemporize ancient narratives, prompting curiosity among younger generations towards their cultural heritage.*
- *Create a familiar space for traditional audiences to interact with emerging technologies.*

*This project has launched my professional journey at the intersection of storytelling, cultural research, interactive technology, and experiential art. I am delighted with the journey so far and feel excited about where this intersection might take me.*



### 10.1 A Blessing

In March, towards the end of this journey, I received a special blessing from my niece. She built a clay model of my version of Kṛṣṇa, which my mom placed in our house temple next to her Laddu Gopal [Fig. 10.1]. At that moment, even before the final installation, I felt the project had already succeeded. My Kṛṣṇa had found a place in my family's hearts, symbolizing a deep connection and acceptance.

### 10.2 Reflection

This project has evolved in a very gratifying manner. Initially, I embarked on this journey out of my passion for ancient mythology, cultural research, and experimenting with new media technologies. However, I unknowingly integrated a deeply personal element into this project—Lord



Figure 10.1: Riana’s Clay Model of Kṛṣṇa next to my mom’s Laddu Gopal

Kṛṣṇa. His presence transformed this project into a time machine, allowing me to reflect on my past and reconsider my family’s practices and teachings.

My parents often found it challenging to understand my work with new media technologies and my field in general. This project provided an avenue for meaningful discussions with them about my work. My mother has never been prouder of my work and proudly tells all her relatives that I am working with Lord Kṛṣṇa. This personal connection has given the project an added dimension of significance and fulfillment.

### 10.3 Future Work

The research and interactions I’ve had with other experts have nurtured my interest in cultural and mythological research. On multiple occasions, I found myself delving deeper than necessary out of sheer curiosity, only to stop reluctantly due to time constraints. This project has instilled in me a newfound respect for my culture’s practices.

All the experimentation and ideation have also opened my eyes to the infinite and exciting possibilities of merging mythological experiences with new media technologies. I wish to continue developing more immersive experiences. I could spend my entire life designing experiences around Hindu mythology and never run out of content or inspiration. However, the opportunity

to explore and study other cultures and religions through this intersection excites me as well.

I envision creating immersive experiences that bring to life the rich tapestry of stories, rituals, and traditions from various cultures. By doing so, I hope to foster a greater appreciation and understanding of diverse cultural heritages, bridging the gap between the ancient and the contemporary.

***Hare Kṛṣṇa!***

(Everything is Kṛṣṇa)

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सर्वभूतेषु येनैकं भावमव्ययमीक्षते |  
अविभक्तं विभक्तेषु तज्ज्ञानं विद्धि सात्त्विकम् |

- भगवद् गीता १८-२०

*That knowledge which reveals one immutable reality in all beings,  
and not as separate in the different bodies - know that knowledge to  
be sattvic (pure).*

- The Bhagavad Gītā Chapter 20, Verse 18