August 2023

Music As a Tool For Ecstatic Space Design

Pranav Amin
University of Massachusetts Amherst

MUSIC AS A TOOL FOR ECSTATIC SPACE DESIGN

A Thesis Presented

by

PRANAV AMIN

Submitted to the Graduate School of the

University of Massachusetts Amherst in partial fulfillment

of the requirements for the degree of

MASTER OF ARCHITECTURE

May 2023

Department of Architecture

MUSIC AS A TOOL FOR ECSTATIC SPACE DESIGN

A Thesis Presented

by

PRANAV AMIN

Approved as to style and content by:

_____

Jordan Kanter, Chair

_____

Stephen Schreiber, Department Chair

Department of Architecture

ABSTRACT

MUSIC AS A TOOL FOR ECSTATIC SPACE DESIGN

MAY 2023

PRANAV AMIN, B.S. ARCHITECTURE,
UNIVERSITY OF MASSACHUSETTS, AMHERST

M.ARCH, UNIVERSITY OF MASSACHUSETTS, AMHERST

Directed by: Professor Jordan Kanter

Music and architecture share a sacred bond across cultures. Their histories intertwine and together, they shape ritualistic, religious, and popular practices. As one of the few remaining avenues of universal transcendental experiences that have been so integral to humans, music's ability to create ecstatic spaces is ever more necessary for the modern human. This thesis uses spatial, artificial intelligence, visual, and aural tools—while engaging in a dialogue between rationalist architecture and shamanic conceptions of spaces—to create an ecstatic space that seeks to reimagine the union of music and architecture. It reveals new ways in which this union can be experienced synonymously and utilizes novel approaches to design such a space.

TABLE OF CONTENTS

Page

LIST OF FIGURES

Figure Page

INTRODUCTION

Architecture is not simply about space and form, but also about event, action, and what happens in space. - B. Tschumi[1]

It is more nearly true of music than it is of anything else that it offers an alternative reality and an alternative way of being. - F. Sparshott[2]

Music and architecture share a sacred bond across cultures. Historically, the two have developed hand in hand, with religion being a common unifier. For example, in the case of Christian hymnody and Georgian chants that developed alongside church architecture, the choice of notes and pacing of music was greatly influenced by the acoustical characteristics of the building of worship and the building materials used.[3] Even before formalized architecture, shamanic cultures used music and sacred space in conjunction as a tool in rituals to bring them closer to their goals of embodying altered states of consciousness. To a large extent, the search for a higher power and spirituality across cultures has resulted in the joint development of music and architecture/space, a development that can still be felt today. The goal of this thesis is to explore how this relationship between music and architecture can create positive cultural effects today. How has the connection manifested in the past? And what are the reasons to explore new methods of union? Lastly, how can existing and emerging design tools be used to reimagine this well-documented intersection? I use digital, analog, aural, visual, and

---

1 Bernard Tschumi, *The Manhattan Transcripts* (Academy Editions, 1981).
2 Francis Sparshott, "Aesthetics of Music: Limits and Grounds," in *What Is Music?* ed. Philip Alperson (New York: Haven Press, 1987), 89.
3 Christopher R. Herr and Gary W. Siebein, "An Acoustical History of Theaters and Concert Halls: An Investigation of Parallel Developments in Music, Performance Spaces, and the Orchestra," (paper presented at the 86th ACSA Annual Meeting and Technology Conference, 1998), 146-147

spatial tools ranging from MAX MSP (a generative audio/visual scripting program) and Midjourney (an AI image generator) to directional speakers and projectors as tools in the design that attempts to address these questions.

At the root of this intersection of music and architecture is the drive towards ecstatic space as a key part of mystical, religious, and cultural traditions—many of which remain vital practices today and underlie the major religious faiths of the modern world. There are various interpretations of what constitutes an ecstatic space.[4,5] However, for the scope of this thesis, I define ecstatic space as a metaphoric environment that responds to the body's experience within it. The space enables the mind to go into an altered state of consciousness, affecting the perception of self and the external environment. It is often associated with causing a perceived state of self-transcendence. [6,7]

Many cultures have used music as the central element in the initiation and perpetuation of ecstatic space. For example, the Zambian possession ritual for healing, performed by the Luvale people, can only occur when music has 'heated up' the ritual space, allowing it to transform so that contact between the human and non-human could commence.[8] Similarly, the ritual of 'Ogu Kut' is performed after the death of a loved one, where music is used as the transformative tool allowing the *mudang*, or Korean 'shaman',

---

[4] Haein Song, "Ecstatic Space: NEO-KUT and Shamanic Technologies," PhD diss., (Brunel University London, 2019), 13.
[5] David F. Krell, *Architecture: Ecstasies of Space, Time, and the Human Body* (SUNY Press, 1997), 83-84.
[6] Jules Evans, "Ten Principles for Making Sense of Ecstatic Experiences," *Age of Awareness* (blog), 22 April, 2022, https://medium.com/age-of-awareness/we-need-better-cultural-resources-to-make-sense-of-ecstatic-experiences-d26a68dad47e.
[7] Song, "Ecstatic Space," 13.
[8] Simon Mills, "Sounds to Soothe the Soul: Music and Bereavement in a Traditional South Korean Death Ritual," *Mortality* 17, no. 2 (May 2012):149, https://doi.org/10.1080/13576275.2012.675231.

to embody the deceased's spirit. Communal prayer in many religions takes the form of song. Music enables participants to feel that the divine presence has indeed arrived.[9] In general, music is a form of abstraction that touches on the very roots of the human condition—conscious of our individual and collective existence within a world both including and transcending us. It is a metaphor for the self-within-the-world condition.[10]

The positive psychological effects of ecstatic experiences on individuals are undeniable, and yet, ecstatic spaces that elicit such experiences have been largely absent within the modernist architectural discourse. Modernist architecture deals with the manipulation of form and space in a way that allows for habitation and function. The modernist approach to architecture, founded on the western enlightenment tradition, builds on and perpetuates a highly rationalist conception of space. In particular, Mies Van der Rohe emphasized the importance of a free plan where structure arranged to the cartesian grid allows for maximal programmatic freedom within.[11] However, the unintended consequence of the global adoption and propagation of this way of thinking is personified in something like the grid-based office cubicle (see fig.1); where architecture is neutral, infinitely extendable, and devoid of ecstatic experience.

[9] Mills, "Sounds to Soothe the Soul," 147.
[10] Bennett Reimer, "The Experience of Profundity in Music," *The Journal of Aesthetic Education* 29, no. 4 (Winter 1995): 1, https://doi.org/10.2307/3333288.
[11] T. V. Gudkova and A. A. Gudkov, "Spatial Modernist Architectural Artistic Concepts," *IOP Conference Series: Materials Science and Engineering* 262, no. 1 (November 2017): 6, https://doi.org/10.1088/1757-899X/262/1/012152.

Figure 1: The office scene exemplifying the Modernist influence. *Playtime*, directed by Jacques Tati (Specta Films, 1967).

The efficient and rationalist box has found its way across the globe and led to the erasure of individuality in architecture. Jacques Tati captures this sentiment in the film Playtime (1967) by mocking American tourists for their awe of modernist buildings in Paris that are no different from the modernist buildings in their own country. In *The Manhattan Transcripts*, Bernard Tschumi identified that architecture lives in the superimposition of space, movement, and events.[12] Architecture has the potential to be truly unique when shaped by what goes on within it, expressing the dynamic and specialized nature of human activity. Despite the perpetuation of this narrative by Tschumi and others alike, the rationalist box has largely dominated the contemporary world of architecture due to its financial feasibility, uniformity, and ease throughout the design and building process.

[12] Tschumi, *The Manhatten Transcripts*.

The rational mind leaves little room for the expansive, historically transcendental practices offered through religious or shamanic avenues. This makes sense because a scientific understanding of the natural world invariably dispels many of the conditions and assumptions that need to be made to enter altered states. However, humans still crave transcendental experiences and seek them out in other ways.

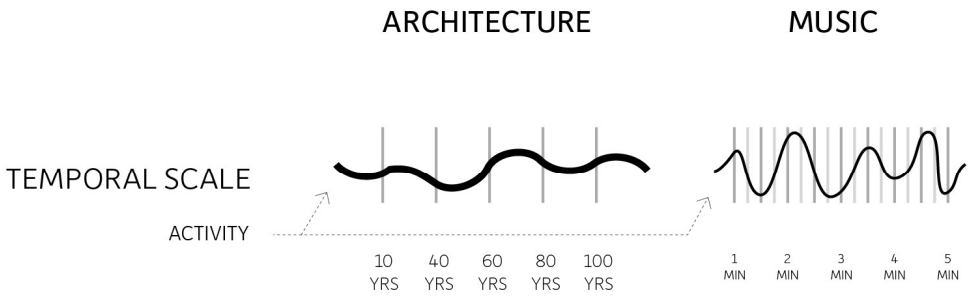

Figure 2: Architecture and music through time (Photo by Author). Architecture and music go through various dynamic and distinct stages of change, but at different temporal scales.

Music and architecture are both dynamic forms of expression. Their shared common elements such as rhythm, harmony, balance, etc. are natural points of entry into the translation across these distinct mediums. Their ability to evoke emotion and shape experience is often understood intuitively, which is why their union has regularly been a cherished exploratory exercise. As seen in shamanic practices, music and space often lay the bedrock for transcendental experience[13]. That is, their union creates an ecstatic space, where the space reacts to the body's experience and the body reacts to the changing space. However, many of the contemporary attempts at uniting architecture and music do

[13] Mills, "Sounds to Soothe the Soul," 147-149.

not function as ecstatic spaces because the built environment is not designed to respond concurrently to the other experiential element—music. The key difference in their temporal perception is what blurs their potential experiential synonymity (see fig.2).

Shamanic precedents show that ecstatic experiences require embodied participation in shaping space through activity.[14] Therefore, to create ecstatic spaces through music, designers must not think of music as the tool and architecture merely as the container. Rather they must act as one, where the music shapes the architecture. Both unfolding and sharing the same temporality. To create such a space, this thesis aims at designing a travelling pavilion for city squares that embodies and revitalizes the temporal union of music and architecture while emphasizing the journey to the ecstatic experience at the core. It employs the generative audio-visual scripting language MAX MSP and AI image generator, Midjourney, to generate the form of the pavilion; while using space, material properties, and sound in a way such that music and architecture can simultaneously affect one another to create an ecstatic experience.

[14] Joshua Schrei, "The Body Is the Metaverse on Apple Podcasts." Accessed September 23, 2022, in The Emerald, podcast, https://podcasts.apple.com/hu/podcast/the-body-is-the-metaverse/id1465445746?i=1000543907145.3

CHAPTER 1

COEVOLUTION OF MUSIC AND ARCHITECTURE

Architecture and music have shaped one another throughout history. Variations in acoustic responsiveness, as a result of differing building forms and materials, have shaped the way music genres and venues have developed. A definitive example of this phenomenon can be found in the Early Christian and Byzantine Churches. Hymns and chants, monophonic and slow paced, are directly attributable to the architecture of churches at the time.[15] The use of stone as the primary building material meant that the interior surfaces of these structures have a very low absorption coefficient and noise reduction coefficient; around $\alpha = 0.05$.[16] The result of this acoustic environment is that almost none of the sound is absorbed by the walls; it is reflected and scattered numerous times within the room, creating substantial reverb and delay. One can now start to understand why fast, busy notes weaving through multiple keys would turn muddy and indiscernible in such an acoustic environment. The notes do not die out quickly and the musician risks different notes bleeding into each other if played through quickly. Thus, simple, diatonic music is preferred in this setting to avoid too much dissonance. Additionally, the resounding sound created in these large spaces in concert with the intense and intentional notes created what might be described as a feeling of spirituality.[17]

---

[15] Herr and Siebein, "An Acoustical History of Theaters and Concert Halls," 146-147.
[16] Amber Book, "Architectural Acoustics 2 of 4: Sound Absorption Coefficient and Noise Reduction Coefficient," YouTube. July 25, 2014, educational video, https://www.youtube.com/watch?v=ysdfoA-t1aA.
[17] Herr and Siebein, "An Acoustical History of Theaters and Concert Halls," 146-147

A similar relationship is observed with orchestral music and venues. As the size of the music halls increased, so did the reverberation times. This brought with it music that focused more on tone color as the primary compositional tool, instead of focusing on intricate harmonic changes. Composers obsessed over varied instrumentation and combinations of sounds for specific effects which would fall flat without the long reverberation times present within the concert halls of the time. This is seen in places such as the Musikvereinssaal in Vienna, built in 1870. It seated 1,680 people and had a reverberation time of 2.2 seconds.[18]

Composers in the 20th century started to pay keen attention to the layout of the orchestra, particularly through the placement of acoustic dampeners and reflectors in the venue. Moreover, they created compositional conventions based on whether the music was intended to be performed in a theater or a concert hall. However, contemporary composers were not only performing contemporary pieces, and so the modern concert hall had to adapt and produce variable reverberation responses based on the piece of music being performed at the time. These design interventions included retractable sound absorption panels, as well as movable and variable ceiling and wall planes.[19] In this way, architecture has also adapted to accommodate musicians and composers, offering sonically dynamic concert venues. This rich history shows the technical and physical influences the two disciplines of music and architecture have had on one other.

[18] Herr and Siebein, "An Acoustical History of Theaters and Concert Halls,"149-150.
[19] Herr and Siebein, "An Acoustical History of Theaters and Concert Halls," 150-151.

CHAPTER 2

CYMATICS

Sound is energy vibrating through a given material; it can be measured and graphically depicted. Sound does not exist merely in the aural dimension, rather it has distinct physical manifestations. This means that translations from sound to shape need not solely rely on methods that rely on metaphor as a tool. There are ways of direct translation that may be appropriate in certain contexts. Cymatics refers to the study of the physical impressions of sound within a visualizing medium.[20] One such method, called the Chladni plates, was developed by Ernst Chladni in the late 18th century.[21] Chladni was able to demonstrate the visual patterns of vibration and sound by scattering sand on an iron plate. A violin bow was used to rub against the plate, producing vibrations which then caused the sand to settle in intricate patterns. The sand settles at nodal points and bounces about with increasing intensity further away from the nodes.[22] When objects start to vibrate along with resonant frequencies, zonal differences are highlighted based on the object and the frequency it is subjected to. Areas differ in terms of the levels of vibration experienced: The areas that experience no vibrations allow for sand to accumulate (standing waves), while sand on the other areas vibrate until they find their way to these standing waves. The regions created by networks of standing waves are

[20] John McGowan, Gregory Leplâtre, and Iain McGregor, "Exploring Musical Creativity through Interactive Cymatics," (paper presented at 31st International BCS Human Computer Interaction Conference, July 2017), 1-3.
[21] Torben Rees, "Ernst Chladni: Physicist, Musician, and Musical Instrument Maker," Whipple Museum, 2009. https://www.whipplemuseum.cam.ac.uk/explore-whipple-collections/acoustics/ernst-chladni-physicist-musician-and-musical-instrument-maker.
[22] Rees, "Ernst Chladni."

called Chladni's figures.[23] A common misconception is that these patterns are a result of the frequency alone and would be replicable exactly on any vibrating surface. Instead, the material properties affect the way in which standing waves manifest themselves. Therefore, any material can be thought of as the artist that produces a unique pattern of vibration given a particular frequency. This simple and inexpensive experiment demonstrates that every sound and its distinct frequency is inherently linked to a unique visual pattern. Additionally, different methods of representing sound visually will reveal distinct patterns because internal factors such as material properties and external properties like amplitude and voltage greatly affect the output.

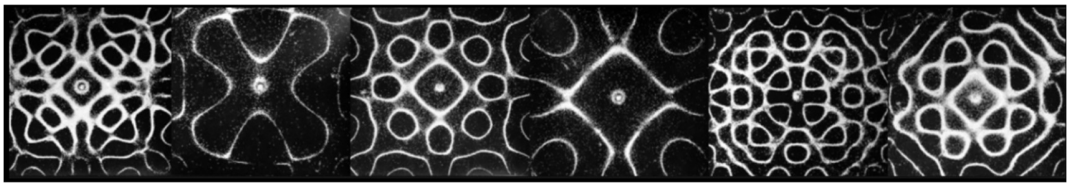

Figure 3: Sound frequencies visually represented on Chladni plates. Chris Smith, *1787-Chladni Plates.* Photograph. Dataphys.org. http://dataphys.org/list/chladni-plates/.

[23] Viktor Matanski, "Formation of Chladni Patterns in Virtual Environment," (2017): 1-16.

CHAPTER 3

MUSIC: A TOOL FOR TRANSCENDENCE

Humans across cultures have long engaged questions about the nature of reality, the origins of the universe, and the reason for existence. These existential questions highlight humans' deep curiosity in understanding concepts beyond the body, community, and time. Disciplines such as philosophy, theology, science, and psychology have, in part, been born out of this curiosity and innate compulsion to answer these questions. These disciplines offer numerous theories on what drives the human experience and what drives humans to search for such answers.

Shamanic cultures held that entering altered states of consciousness, while under the influence of psychedelics or through music and dance, allowed them to transcend into an augmented reality—spirit world. This realm, containing amplifications of the waking world, was believed to be integral in gathering insight and answers to the questions mentioned in this section. The body remains in the physical world, while the mind wanders in another. This highlights the deep other worldly needs of humans.[24]

3.1 The Human Need for Transcendental Experiences

Viktor Frankl claimed that the capacity for self-detachment and self-transcendence are fundamental characteristics that compel and direct humans towards something other than themselves. It is a mistake to conceptualize humans as a closed system. Theories based on the homeostasis principle, which maintain that humans'

[24] Joshua Schrei, "Reissue: How Trance States Shape the World," August 9, 2022, in The Emerald, podcast, https://podcasts.apple.com/jm/podcast/how-trance-states-shape-the-world/id1465445746?i=1000512752303.

tendency to regulate or stabilize inner equilibrium by reducing tensions is the driving motivator of operations, neglect the self-transcending quality of human existence.[25]

Freud believed that human action, at its core, is governed by the drive towards pleasure—immediate or delayed. Frankl points out the self-defeating nature of a life structured towards the attainment of pleasure. The goal of attaining pleasure results in it escaping because pleasure is attained as a by-product of attaining a goal.[26] Adlerian psychology makes a similar misstep by claiming that the drive towards power is the central motivator of humans.[27] Frankl claims that both theories—the will to pleasure and the will to power—are derivatives of the primary human concern of will to meaning.[28] The Freudian will to pleasure guides the child, the Adlerian will to power guides the adolescent, while the will to meaning guides the mature adult.[29] The will to meaning necessitates looking outside oneself, often leading to the frontiers of what is known, into the realm of speculation and the transcendent.

The search for meaning is a deep journey. It can be individual or communal. One can simultaneously derive meaning from various avenues. Historically, meaning often came as a consequence to existential questions which were answered through religious traditions. Both organized religions and shamanic practices imparted meaning to communities through myth and rituals. The shamanic conception of trance played a major role in the search for meaning. Rituals practiced trance states to invoke transcendental or

---

[25] Viktor E. Frankl, "Self-Transcendence as a Human Phenomenon," *Journal of Humanistic Psychology* 6, no.2 (April 1966): 97.
[26] Frankl, "Self-Transcendence as a Human Phenomenon," 98.
[27] Frankl, "Self-Transcendence as a Human Phenomenon," 98.
[28] Frankl, "Self-Transcendence as a Human Phenomenon," 98.
[29] Aaron J. Ungersma, *The Search for Meaning* (Oxford, England: Westminster Press, 1968), 26-27.

ecstatic experiences that would help gather insight about the waking world.[30] Etymologically, trance is derived from *transire,* which means *passage.* It involves the passage from everyday consciousness into a temporary altered mental state, generally leaving individuals affected by the experience.[31] "The attainment of trance states has been such a primary driver that some anthropologists have called trance the main need of the ceremonial animal that is the human being."[32] Anthropologists such as Erika Bourguignon argue that trance is a part of healthy human behaviors. Her research shows that out of the 488 cultures studied, 90% practiced forms of altered states of consciousness, while the remaining 10% had insufficient evidence of trance practices.[33] This shows how central trance practices were cross culturally. However, it is important to note that the insights gained through trance practices are not inherently true. It is safe to say that the prevalence of these practices in the past was in part a consequence of humans' lack of understanding of the natural world. As the scientific method began to produce reliable and objective answers, reliance on trance, ecstatic, and transcendental experiences as methods of gaining insight into the natural world diminished. However, the role of trance was never limited to answering questions about the natural world. Trance is a healthy human activity that contends with deep mythic and other worldly

[30] Schrei, "How Trance States Shape the World."
[31] Ann Harrington, "Thinking About Trance Over a Century: The Making of a Set of Impasses," in *Hypnosis and Mediation: Towards an Integrative Science of Conscious Planes*, ed. Michael Lifshitz and Amir Raz (New York: Oxford University Press, 2016), 2.
[32] Schrei, "How Trance States Shape the World."
[33] Erika Bourguignon and Louanna Pettay, "Spirit Possession, Trance, and Cross-Cultural Research," Transcultural Psychiatric Research Review and Newsletter 2, no. 1 (April 1965): 13-15, https://doi.org/10.1177/136346156500200105.

needs that are innate to humans.[34] Modern society, in its efforts to gratify all human desires, leaves out Frankl's most fundamental need for meaning.

3.2 Profundity in Music

Music is a profound practice that can instill a state of rapture, transcendence, and consequently meaning within people universally. It holds inherent meaning and emotion, which is often accompanied by additional literal narratives that have the capacity to influence and persuade the listener. It can trigger memories, strengthen or weaken societal connections, and even elicit physical responses. When done compellingly, its capacity to capture a population is so immense that it has been employed as a tool to control and form societies.

3.2.1 What Makes Music Profound?

It is the profundity in music that elicits transcendental experiences that usually manifests in the subjective dimension of the subject-object polarity within music.[35] The objective properties causing musical profundity remain elusive due to the following observations—not all music leads to profound experience; music that evokes profundity in one individual may not do the same in another; music that evoked profundity in an individual may not do the same at a different time, place, or setting; the variance in experience may be caused due to the psychological readiness of the subject; etc. Additionally, any such experiences are deeply subjective and necessitate a reliance on metaphor and figurative speech in order to be expressed.[36]

---

[34] Schrei, "How Trance States Shape the World,"
[35] Reimer, "The Experience of Profundity in Music," 2.
[36] Reimer, "The Experience of Profundity in Music," 2.

Researcher Robert Panzarella, in the study "The Phenomenology of Aesthetic Peak Experiences," categorized profound musical experiences expressed by participants. The results indicated four major categories—renewal ecstasy (a renewed positive vision of beauty within the world despite all its tragedy; an altered vision of the world), motor-sensory ecstasy (physical responses such as varied heartbeat rate, chills, weightlessness, etc.), withdrawal ecstasy (disconnection with the physical and social environment), and fusion-emotional ecstasy (a sense of oneness with the music).[37] Panzarella also notes that 90% of respondents reported that the memories associated with the experience created lasting, positive impacts such as greater retention of the experience, developing a greater appreciation for music, and even altering their self-appreciations and attitudes toward life.[38] A similar study by Alf Gabrielsson and Siv Lindstrom Wik collected "strong" experiences from some 800 participants and found similar positive effects of new insights, possibilities, mental and physical purification, and a sense of healing.[39]

The subjective nature of the experiences and variations in the translation of experience into language lead to the use of several terms that essentially describe the central capacity for transcending one's current understanding or state through music. David A. White notes that music serves as a simulacrum of reality in that it resembles a unified representation of reality. It is dependent on the individual's ability to relate the

---

[37] Robert Panzarella, "The Phenomenology of Aesthetic Peak Experiences," *Journal of Humanistic Psychology* 20, no.1 (January 1980): 74-77. https://doi.org/10.1177/002216788002000105.
[38] Panzarella, "The Phenomenology of Aesthetic Peak Experiences," 80-81.
[39] Alf Gabrielsson and Siv Lindström Wik, "Strong Experiences Related to Music: Adescriptive System," *Musicae Scientiae* 7, no. 2 (September 2003): 4. https://doi.org/10.1177/102986490300700201.

expressive, aesthetic content to his nonmusical, nonaesthetic existence. [40] Because the worlds created through music, unlike worlds created through literature and representational painting, are not saturated with materials directly related to the physical world, they are revelatory of the human spirit itself and its creative powers.[41] Moreover, powerful revelations of the human spirit are indeed likely to be associated with the divine, causing music to be a central participant in religious and shamanic excursions.[42] Additionally, deployment within contexts and settings/spaces that themselves hold religious, cultural, and spiritual significance furthers the likelihood of transcendence.

3.2.2 Music to Mold a People

In ancient China and Greece, music was regarded as the image of the universe. Confucius and Plato both believed that music possessed the affective power of molding human character.[43] Confucius, to a large extent, was informed by the five classic Chinese texts that placed enormous spiritual importance on music and musical intervals. For example, in the *Li Chi* text, the perfect fifth interval (see fig.4) whose tones correspond to the ratio 3:2, was especially held in high esteem. The text explains that "since 3 is the symbolic numeral of heaven and 2 of earth, sounds in the ratio 3:2 will harmonize as heaven and earth."[44]

---

[40] David A. White, "Toward a Theory of Profundity in Music," *The Journal of Aesthetics and Art Criticism* 50, no. 1 (Winter 1992): 32-33. https://doi.org/10.2307/431064.
[41] Alan Goldman, "The Value of Music," *The Journal of Aesthetics and Art Criticism* 50, no. 1 (Winter 1992): 43. https://doi.org/10.2307/431065.
[42] Reimer, "The Experience of Profundity in Music," 10.
[43] Siu-Chi Huang, "Musical Art in Early Confucian Philosophy," *Philosophy East and West* 13, no.1 (April 1963): 55. https://doi.org/10.2307/1396785.
[44] Robert W. Marks, "The Music and Musical Instruments of Ancient China," The Music Quarterly 18, no. 4 (October 1932): 594. http://www.jstor.org/stable/738941.

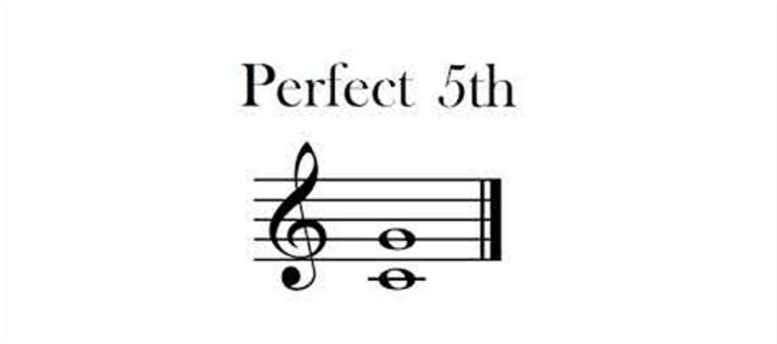

Figure 4: Illustration of the perfect 5th interval. Music Rudiments Sounds, "Perfect 5th Harmonic Interval," YouTube. May 5, 2018, educational video, https://www.youtube.com/watch?v=dDvu42ssjsw.

It was believed that music was a crucial tool that maintained cosmic balance.[45]

Each of the five notes of the ancient Chinese scale rigidly represented a particular aspect of society during emperor Shun's reign (2255 B.C.)—the Emperor (*chung*), the Prime Minister (*shang*), the Loyal Subjects (*chiao*), and the Affairs of the State (*chi*). It was believed that notes needed to be tuned perfectly in order to maintain societal balance. Deviation from the perfect tuning was thought to bring about universal contempt for others and their rights.[46] Music was considered the primary discipline for the wellbeing of the society in the Confucian social and political system; higher than governance or law in its impact on moral and social balance.[47] The leader alone, qualified to rule the people, knew how to use music to cultivate good citizens. The harmonious expression of music would eradicate social and political chaos, confusion, and disorder.[48] Over-reliance on this philosophy meant that Emperors such as Shun thought that their interpretation of

[45] Tantacrul, "Musical Elitism Is Everywhere," YouTube. April 8, 2022, Educational video. https://www.youtube.com/watch?v=azpxUnIgsts.
[46] Marks, "The Music and Musical Instruments of Ancient China," 595.
[47] Huang, "Musical Art in Early Confucian Philosophy," 56.
[48] Huang, "Musical Art in Early Confucian Philosophy," 57.

music from different villages could reveal virtues or defects of the people, leading to inhumane prescriptions as means of remedy.[49]

An extreme example of weaponizing music for social control can be found in the aftermath of the historic disaster of the Great Chinese Famine, which killed an estimated 20-45 million people. Mao Zedong planned The Cultural Revolution of the Proletarian Class to reset Chinese society. All historical and foreign influences, along with any sign of bourgeois elitism, which he believed was perpetuated through education, were to be eliminated. The uncontaminated proletarian socialist society would eliminate and outlaw all music, books, paintings, and other cultural artifacts created since the birth of civilization. Only one book—*Selected Works by Mao Zedong*—was available and required to be possessed by all, and only one song praising Mao was permitted in the first years of the revolution.[50] The education system was completely shut down. Teachers and scientists considered to be part of the intellectual bourgeois were routinely beaten, tortured, and murdered.[51] Even though Mao outlawed Confucianism, his actions revealed that he continued to operate under the Confucian idea of music shaping society and its people. He believed that all music was tightly associated with class. Thus, building a classless society meant wiping out the entire history of music.[52]

---

[49] Marks, "The Music and Musical Instruments of Ancient China," 595.
[50] Mao Yu Run, "Music under Mao: Its Background and Aftermath," *Asian Music* 22, no. 2 (1991):117. https://doi.org/10.2307/834309.
[51] Tantacrul, "Musical Elitism Is Everywhere."
[52] Tantacrul, "Musical Elitism Is Everywhere."

CHAPTER 4

CONCEPTUALIZING SPACE

The characteristics of space or setting play a major role in preparing an individual to experience transcendental experiences through music. Is architecture, especially today, conducive to creating spaces that could help produce ecstatic experiences? The power of music in creating transcendental experiences can be greatly improved when the setting is designed in accordance—space that is flexible, dynamic, and able to prime the user to be receptive to new experiences. Contemporary architectural styles that are rooted in the rationalist conception of space are unable to serve this purpose.

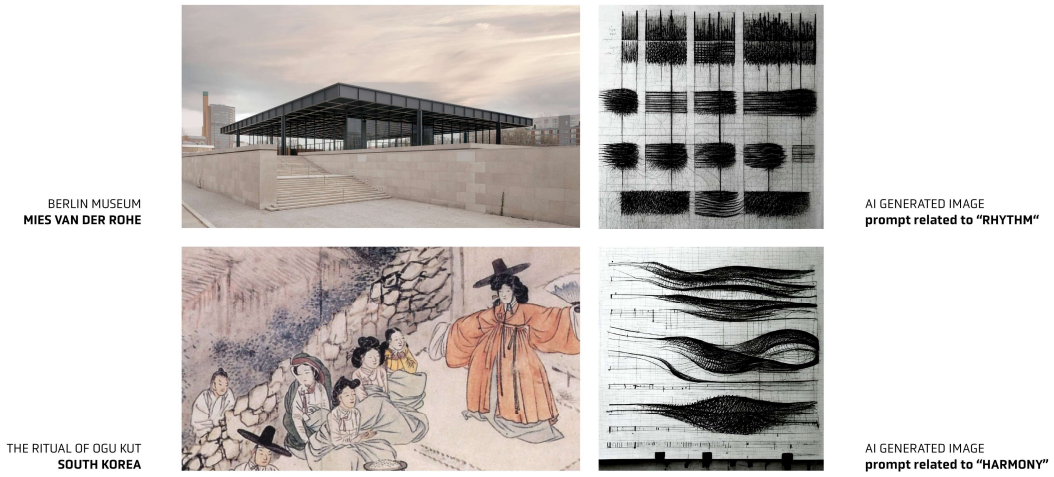

Figure 5: Comparing rationalist and shamanic conceptions of space with the rhythm and harmony within music. Devanshi Shah, *Neue Nationalgalerie*, photograph, stirworld, September 14, 2021, https://www.stirworld.com/see-features-david-chipperfield-restores-mies-van-der-rohe-designed-neue-nationalgalerie-berlin [top left]; *The Korean Mudang*, image, The Orient, February 28, 2008, https://ancientworlds.net/aw/Article/1041681 [bottom left]; "Rhythm" [top right] and "Harmony," [bottom right] images generated by Midjourney.

4.1 Rationalist Conception of Space

Rationalist architecture has a long evolution inspired by the works of Karl Friedrich Schinkel and later formalized by architects such as Mies van der Rohe and

Walter Gropius, who were known for their tectonic order and purist form.[53] Rationalist architecture, along with its offshoots—Neorationalism, Functionalism, and Modernism, for instance, all stem from the profound belief in the meaningfulness of order in architecture. Gropius stressed the Rationalist method beyond the building itself into the building process and city planning. Rohe's work, especially after 1921, was focused on the celebration of construction techniques and materials by showcasing them. The Barcelona Pavilion (1929) for example, split from the Functionalist style, in that it drove towards the conception of a multifunctional space. One that is neutral, and repeatable.[54]

Rohe's conception of space was founded on the logic of structure and its expression. He pointed out that the function of the column was to hold up the roof structure, and the function of the wall was to divide space. Thus, the structure may be organized along a neutral, uniformly extendable grid, but the walls dividing the space within could be freed from structural burdens and be tasked with organizing space itself.[55] This line of thinking was not always successful in his works. Ironically, one of the most well-known examples of Miesian Rationalist thought—The Barcelona Pavilion—actively disguises structure to create this illusion. Still, it fails to sell this illusion according to Robin Evans who points out instances where additional structure is hidden within the roof slab and marble walls. The slender steel posts look 'dangerous' if one assumes that they are the sole supports for the structure.[56] Of course, Rohe's other

---

[53] Werner Durth and Roland May, "Schinkel's Order: Rationalist Tendencies in German Architecture," *Rationalist Traces* 77, no. 5 (2007): 44. https://onlinelibrary.wiley.com/doi/abs/10.1002/ad.514.
[54] Durth and May, "Schinkel's Order," 47-48.
[55] Robin Evans, *Translations from Drawing to Building and Other Essays* (Cambridge: MIT Press, 1997), 239.
[56] Evans, *Translations from Drawing to Building,* 239-241.

works such as the Farnsworth House were more successful in expressing the honest structure of the building. The large wide flange columns on the exterior showcased the structure and the some of the interior walls ended before they touched the ceiling, revealing their independence from structure and flexibility which was important for the concept of the free plan.[57]

In any case, it didn't matter if all of Rohe's works were true to his conceptions because they were successful in portraying and propagating a clear image of what Rationalist architecture, and consequently modern architecture should look like—"precise, flat, regular, abstract, bright and, above all, rectilinear."[58] In this way, Rationalist architecture does not need to be Rationalist to be considered as such. Buildings that exhibit, what Evans calls, sublime rationality pass as Rationalist architecture because they look the part.[59] The consequence of this easy to achieve, economical, attractive Rationalist look that need not comply with its established meaning, is the explosion of this type of building across the world. I would argue that this phenomenon played a role in the visual convergence of cityscapes across the world and the erasure of individuality to some extent. Thus, the unintended consequence is the pervasive conceptualization of space as a grid-based, infinitely extendable, and neutral space.

Rationalist space can also be described through the lens of Cartesian thought that regards quantitative measures with greater importance for design than the body itself.

---

[57] Gudkova and Gudkov, "Spatial Modernist Architectural Artistic Concepts."
[58] Evans, *Translations from Drawing to Building*, 242.
[59] Evans, *Translations from Drawing to Building*, 244.

This led to the body being segmented and measured purely by mathematical standards.[60] "Space in Cartesian thought is a series of coordinates, drawings, plans, scale models, and scale projections. Space in the modern world often is considered a blank void independent from the subject."[61] Here, the individuals occupying space are mere points of data that help determine quantitative information such as occupancy loads, egress calculations, room sizes, etc. It neglects the important ways in which space needs to consider human movement, interactions, and other dynamic processes.

4.2 Shamanic Conceptions of Space

In contrast to the Rationalist conception of space, the shamanic conception of space is one of harmony and dynamism. These shamanic conceptions of space are often manifested through shamanic rituals involving music and dance. Thus, observing the interplay between music, the shamans, spectators, and the physical space offer useful insights and a framework to guide the design of ecstatic spaces.

One shamanic ritual that unifies the physical world and the spiritual world is the Korean ritual of *kut.* Korean shamanism is closely intertwined with animist, Taoist, and Buddhist elements where all creatures and inanimate objects are believed to possess spirits. It pursues a harmonious relationship between spirits to unify as beings existing in the natural world.[62] By using dynamic rhythmic songs, dances, and prayers, *kut* aims to evoke this harmony between the internal state (e.g., energy, feelings, breathing), external

---

[60] Kathleen Glenister Robers, Ya-hui Irenna Chang, and Lukasz Matuszyk, *A Body Living and Not Measurable: How Bodies Are Constructed, Scripted and Performed Through Time and Space* (Boston, United States: BRILL, 2019), 85. http://ebookcentral.proquest.com/lib/uma/detail.action?docID=6481663.
[61] Glenister Robers, Chang, and Matuszyk, *A Body Living and Not Measurable*, 86.
[62] Song, "Ecstatic Space," 42.

state (physical bodily movements and material movements), the shaman and the guests, and between the *kut* and the spiritual world.[63]

Figure 6: Images from a *kut* ceremony. Song. "Ecstatic Space," 90, 125.

The ritual transports the shaman and spectators into the ecstatic space by progressing through three stages: the preparation, journey, and connection to the spirit world. First is the preparation of the space. Because most *kut* is performed at the request of guests for diverse occasions, there is no common venue. In preparation, shamans and other performers decorate the chosen space (e.g., city center, on the waterfront, or in private houses) with various shamanic devices, or *mugu*, that symbolize elements of the mythical world to transform the ordinary space into the *Kutp'an*—a stage where the *kut* is performed. Examples of *mugu* include *kime* or paper cut into shapes of gods, spirits, human, and the natural world and the *k'ŭndae*, a divine pole acting as a portal for the gods. The type of *kut*—public or private—as well as its purpose—for healing, blessing, or comforting the dying—determine which *mugu* are used to decorate the *Kutp'an.* The next stage is embarking on the journey to the ecstatic space. This journey is guided by the dances, drumming, and songs sung by the *kut* performers. The drumming rhythm is a

[63] Song, "Ecstatic Space," 47.

crucial element in the ritual as the dancer's movement, breathing, and singing are all grounded by the beat, which also helps connect the performers to the spectators as they begin to move their shoulders and feet to the rhythm.[64] As the tension and energy in the space build, the dance and music transport the performers and spectators into the ecstatic space. The shaman's body is transformed into the medium for the spirits to communicate with the material world. This results in guests escaping from the frustrations, conflicts, stresses, and sorrows of everyday life.[65]

Another shamanic ritual that utilizes music is performed by the *sangomas*, or traditional healers, in South Africa where the goal is to connect the material world with the spiritual world—specifically, to create harmony between the living and the dead. It is believed that the *sangomas* derive their power from their ancestors and thus require a summoning ritual to transform the *sangoma's* body into a spiritual medium.[66] The ritual is held either inside *sangoma's* hut, which includes a dedicated space for the sacred shrine where the ancestors reside, or outdoors by the sacred tree outside the *sangoma's* hut. The shrine inside the hut occupies a corner of the wall furthest from the door and faces east. The walls are often covered with patterned cloths.[67] One must take off their shoes, bow, and clap twice as a greeting. Then the *sangoma* will burn a *mpepho* plant to attract the attention of the ancestors.[68] To bridge the material to the cosmic world and enter the trance state, the *sangoma* makes a snuff offering and starts to dance and chant to

---

[64] Song, "Ecstatic Space," 49.
[65] Song, "Ecstatic Space," 76.
[66] David Cumes, *Africa in My Bones: A Surgeon's Odyssey Into the Spirit World of African* (New Africa Books, 2004). 23.
[67] "Zulu Sangoma," Eshowe: the Heart of Zululand, accessed April 24, 2023, https://eshowe.com/zulu-sangoma/z.
[68] Cumes, *Africa in My Bones*, 13.

the drum accompaniment played by their trainees. It is the sound of the drum that brings forth the ancestors' spirits. When the spirit enters the body, the *sangoma's* voice often changes or they start to speak in tongues as they become the channel for the ancestor.[69]

Together, the Korean *kut* and South African shamanic rituals by the *sangoma* show certain commonalities that add to the success of the ecstatic space. These can be grouped into the following stages—preparation, journey, and ecstatic experience.

[69] Cumes. *Africa in My Bones*, 9.

CHAPTER 5

PRECEDENTS

The precedents in this section helped develop the tools necessary for the execution of the pavilion. It was important to study examples of architecture influenced by music and identify the approaches of translation from music to form. It was equally important to identify the elements and characteristics that did not comply with the goals of this thesis. Moreover, non-architectural precedents such as art installations proved to be integral since they frequently set out to create ecstatic experiences through art. Thus, they are invaluable in understanding the essence of creating an ecstatic space.

The Philips pavilion by Iannis Xenakis and Le Corbusier and the Stretto House by Steven Holl are examples of architecture inspired by music. Both structures use musical concepts to infer spatial and geometrical relationships. They adopt different approaches in how music is translated to form. Xenakis employed a mathematical approach whereby he used mathematical equations which resulted in geometrical forms that mimicked the concept of glissando—continuous glide from one pitch to another. This resulted in the paraboloid form of the Philips pavilion (see fig. 7).[70] In the case of Stretto House, Steven Holl used the concept of stretto—musical phrases played in a compressed and overlapping fashion—to essentially create a metaphoric translation such that the form of his building overlaps and cascades across the site (see fig. 8).[71] Both instances show unique approaches of translating from music to architecture which are valuable in setting

[70] Spatial Music Form, "Le Corbusier / Varèse / Xenakis," YouTube, May 13, 2021, educational video, https://www.youtube.com/watch?v=P-a5UUiyyWY.
[71] "Stretto House," Steven Holl Architects, June 27, 2017, https://www.stevenholl.com/project/stretto-house/.

up a method of translation for this thesis. However, the influence in these cases between music and architecture is limited in one direction. The architecture is not designed, outside the impact of the acoustic characteristics of the building materials, to affect how music is produced in these environments. The architecture does not respond concurrently to music since it has not been designed to share the same temporal realm.

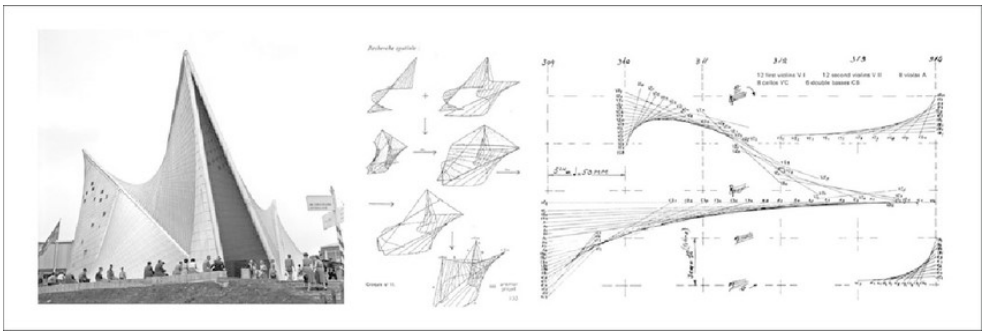

Figure 7: Philips Pavilion- Iannis Xenakis. Panagiotis Parthenios, Stefan Petrovski, Nicoleta Chatzopoulou, and Katrina Mania, *Reciprocal transformations between music and architecture as a real-time supporting mechanism in urban design* (International Journal of Architectural Computing, 2016), fig. 1.

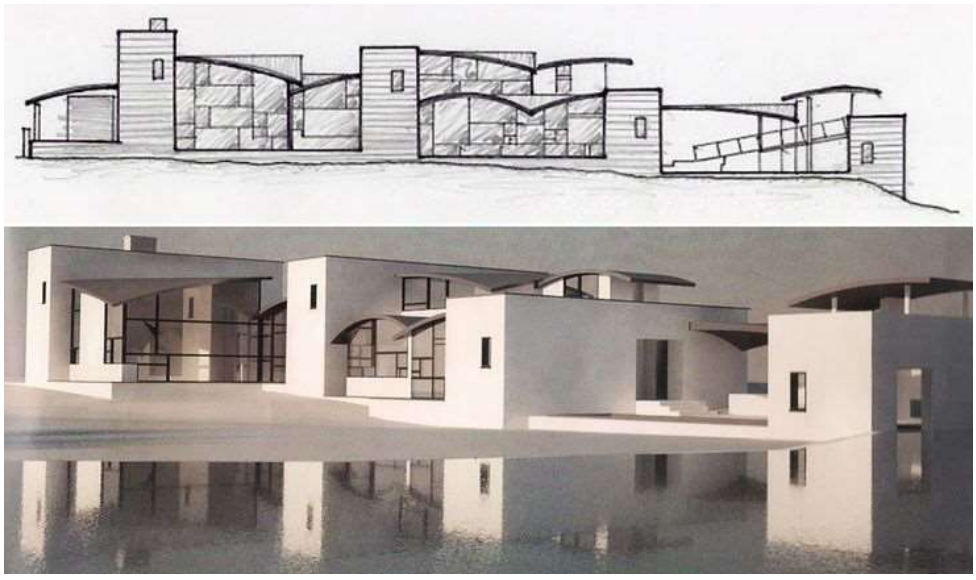

Figure 8: Stretto House- Steven Holl. *Steven Holl Stretto House,* image, Pinterest, https://www.pinterest.com/pin/475974254348034151/

Philip Beesley's architecture adjacent installation, called Hylozoic Ground, is an immersive, interactive environment made of lightweight digitally fabricated components fitted with microprocessors and sensors. It is a responsive architecture that simulates life. The geotextile is clothed with mechanisms that allow the structures to breathe, shift, and move in response to human presence and activity (see fig. 9). The installation is also equipped with a wet chemistry system which converts toxins in the environment into harmless substances such as limestone and carbonates.[72] In this way, Hylozoic Ground is an architecture that responds to human activity within it, and a valuable precedent in creating ecstatic spaces.

Figure 9: *Hylozoic Ground- Philip Beesley,* photograph, Metalocus, October 8, 2012, https://www.metalocus.es/en/news/regenerative-and-responsive-architecture-ii-hylozoic-series-mobile-forest

[72] Enrico, "Philip Beesley: Hylozoic Groud. Canadian Pavlivion at ARchitecture Biennale Venice 2010/ Interview," Vernissage TV, September 10, 2010, https://vernissage.tv/2010/09/10/philip-beesley-hylozoic-ground-canadian-pavilion-at-architecture-biennale-venice-2010-interview/

Another important precedent in the development of this thesis is The Veiling by Bill Viola which uses a system of scrims that catch light from two video projectors. A man and woman slowly walking towards each other are projected through the scrims from either end. The images grow fainter as they pass through each scrim, creating a region of intersection where the two meet (see fig. 10). The ghostly projections create a series of varying scenes highlighting the multiplicity of experience that exists within and through interaction with others. This concept of distinct experiences intermingling to create moments of interaction and intersection is profound and becomes a key element in the design in this thesis.[73]

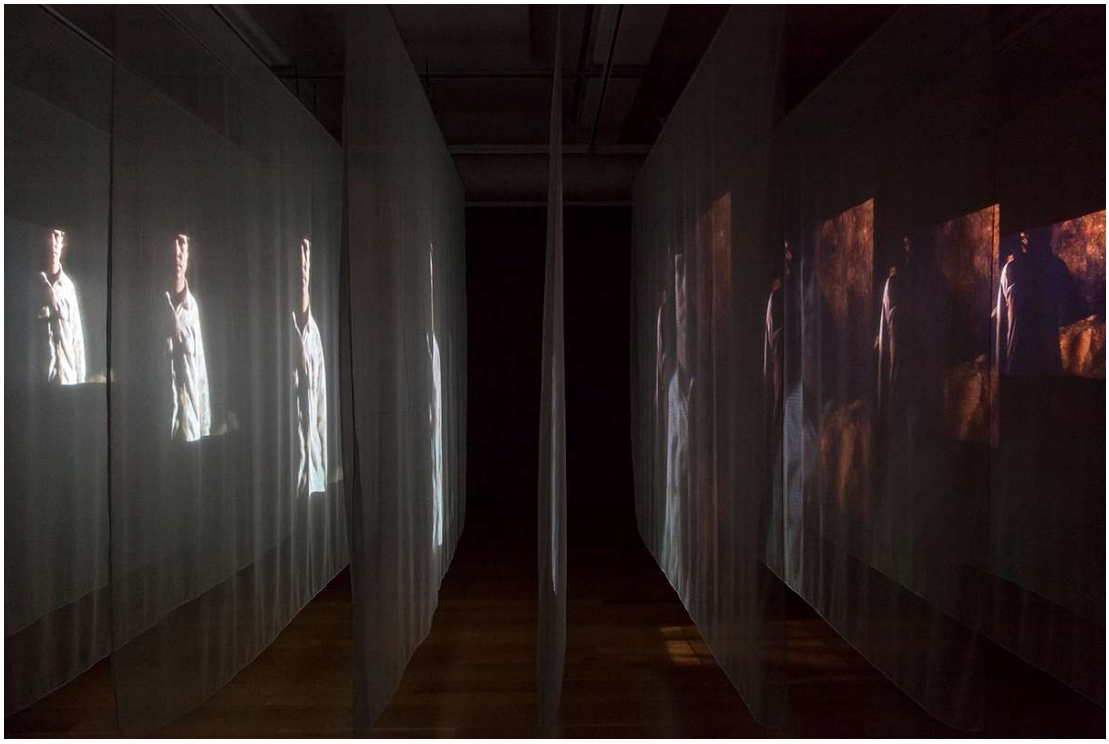

Figure 10: The Veiling- Bill Viola. *Bill Viola, The Veiling, 1995,* Photograph, Fabric Workshop Museum, Accessed April 27, 2023. https://fabricworkshopandmuseum.org/exhibition/bill-viola-the-veiling/.

[73] "Bill Viola: The Veiling," Fabric Workshop Museum, Accessed April 27, 2023. https://fabricworkshopandmuseum.org/exhibition/bill-viola-the-veiling/.

Lastly, the Abbey Road echo chambers were a useful precedent in starting to think of the building itself as an instrument or a tool that augments sound based on the needs of the program. The echo chambers are reflective rooms with hard surfaces that reflect sound from a speaker intended to be picked up by omnidirectional microphones. Diffusers shaped like large pipes are erected in strategic positions to further the randomized pattern of scattering sound. This creates various sets of soundwaves that reach the microphones at different times—creating an echo.[74] The effect and its intensity are determined by the size of the room, surface material, mic and speaker type, and their placement.

Figure 11: *Studio Two Echo Chamber*, Photograph, Abbey Road Studios, January 13th 2022, https://www.abbeyroad.com/news/studio-two-echo-chamber-gearthatmadeus-3114

[74] Bobby Owsinski, "Inside The Abbey Road Echo Chambers," Bobby Owsinski Music Production Blog, January 7, 2020. https://bobbyowsinskiblog.com/abbey-road-echo-chambers/.

CHAPTER 6

SITE + PROGRAM

In an attempt to unite music and architecture into a physical manifestation, I decided to design a traveling pavilion which would be erected in city squares for a duration of three months. Like the ritual of *kut,* which has no specific location, [75] the pavilion travels to different regions to create ecstatic experiences wherever it goes. The minimal program involved in creating this space allows for the structure to be assembled, disassembled, and be transported to another city with relative ease. The lack of a specific site in this design allows the pavilion's form to remain uninfluenced by most physical site conditions that are normally crucial. However, other site considerations specific to city squares such as ambient noise, light, surrounding activities, and assembly become important.

The circulation functions like layers of an onion where each layer reveals the next programmatic layer as it transitions from entrance to the ecstatic space at the core (see fig. 12a). The program of the pavilion is inspired from my understanding of the essential elements or stages common among various shamanic rituals for the attainment of transcendental experiences which are as follows- The preparation of the physical space at the location where the ritual is conducted; the transcendental experience itself which is the final goal of the ritual; and the journey or passage that connects the two (see fig. 12b). The passage is a crucial stage in this program because it takes on the role of the shaman

[75] Song, *Ecstatic Space*.

to prime the participants so that they are psychologically receptive and informed about the way in which the ecstatic space itself functions.

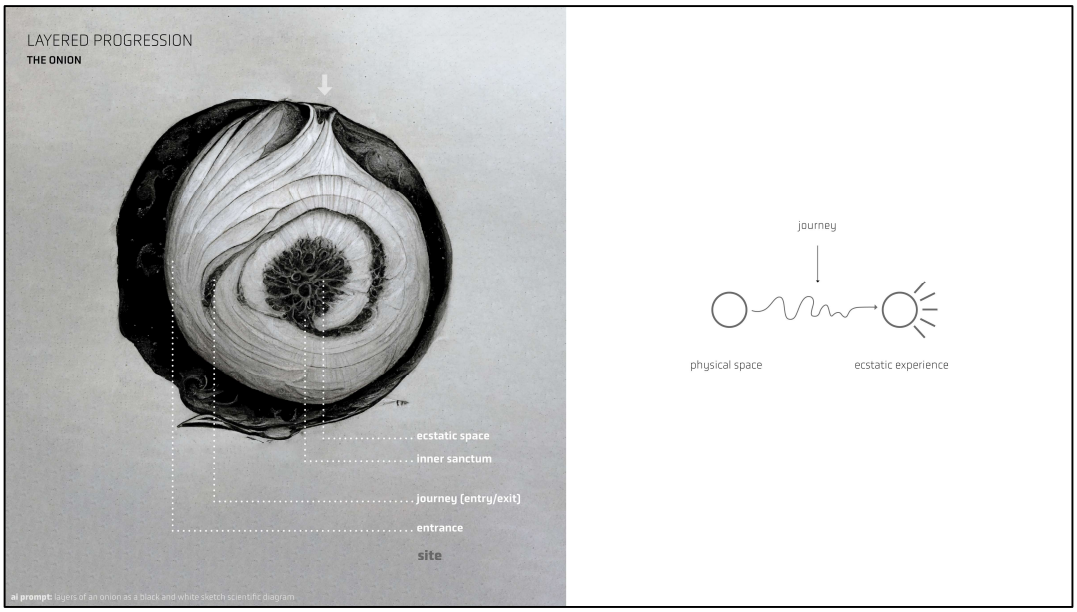

Figure 12: a. Layered progression [left]. b. Elements of a shamanic space [right] (Photo by Author).

The final programmatic elements include- Entrance, primer alley (journey), inner sanctum (ecstatic space), and a reflection area. Additional supporting spaces include- Mech./I.T. room, back of house area, echo chambers, and sound lock vestibules.

CHAPTER 7

METHODOLOGY

The methodology for this thesis ranges from loose exploration to detailed designing. These can be divided into three major camps (see fig. 13).

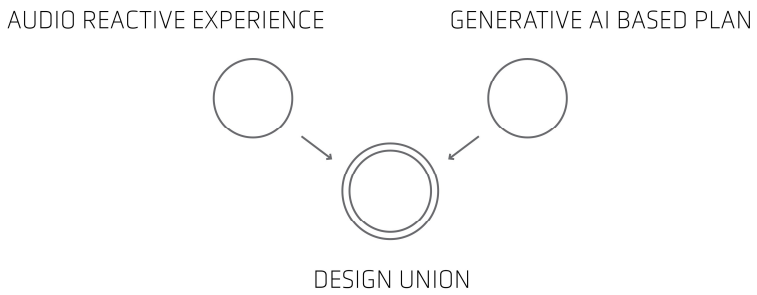

Figure 13: Methodology camps (Photo by Author).

7.1 Audio Reactive Experience

The first camp of the design involved creating my own cymatics experiment. I used a Panasonic TR 707 TV (see fig. 14), which is a Cathode Ray Tube TV (CRT TV) from the 1970s, to create a rig that would convert musical input into a visual response. I split an electric guitar signal into two instrument cables, each affected by distinct guitar pedals. I then rewired the CRT TV such that the deflection coils responsible for creating a picture on the phosphorescent screen of the TV, by means of electron deflection, could be connected to the guitar signal. In this way, the plucking of the guitar string produces an

electric charge in the guitar pickups, which is sent through the pedals into an amplifier to increase the amplitude of the signal, and finally into the deflection coils which deflect electrons along the X and Y axes. This produces an intricate visual response to the music produced through the guitar. I tweaked the experiments in various ways, for example, sending a sine wave through the computer to one deflection coil while maintaining the guitar signal through the other and using various effects pedals to produce varied visual responses (see fig. 15).

Figure 14: Panasonic TR 707 CRT TV (Photo by Author).

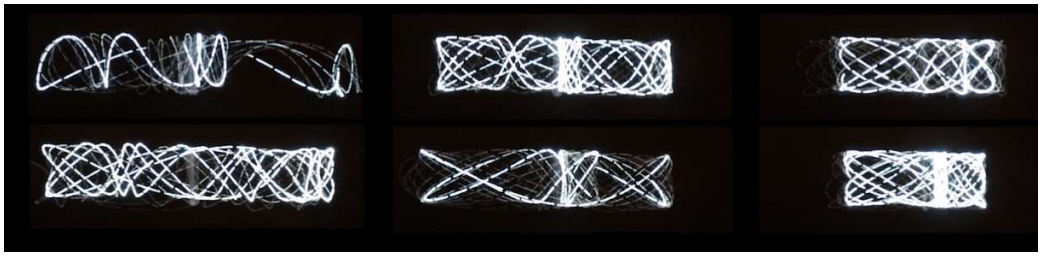

Figure 15: Experiments with the CRT TV (Photo by Author).

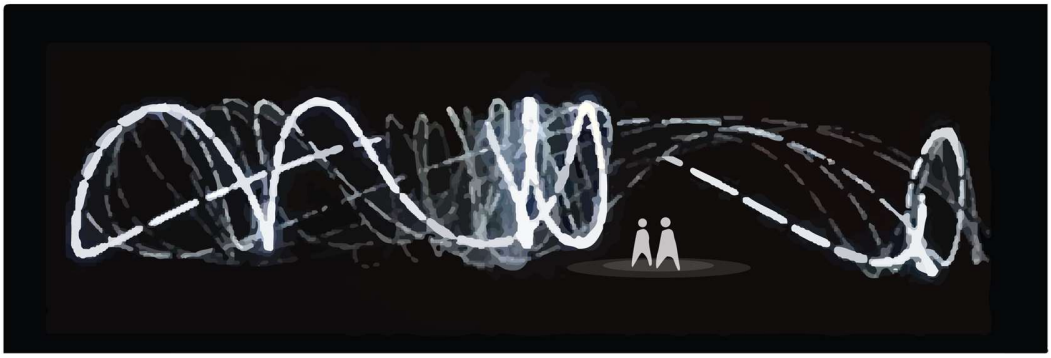

Figure 16: Audio-reactive environment (Photo by Author).

This experiment became the key inspiration for an architectural environment which responds and morphs as a response to the music produced within it (see fig. 16). I then furthered this reactive experience digitally in MAX MSP, a generative audio/visual scripting software, to exert greater control over the visual representation and better suit the needs of the pavilion design.

I began by experimenting with a particle system orbiting around an axis (see fig. 17). I discovered that manually flipping the particle flow direction resulted in the momentary termination of the attraction parameter which is meant to maintain the circular particle flow. This short period of "zero gravity" throws the particles off course based on the velocity of the change in direction, resulting in the effect I am calling "particle disruption". I then began adding parameters to this patch so that I could use audio input to initiate particle disruption. Essentially, I used the amplitude of the incoming sound picked up by the computer microphone as the determining factor for the velocity at which the particle flow would be flipped. In this way, any sound produced

over a certain threshold would be analyzed for its amplitude, scaled to match the initial range of velocity that produced the desired effect, and then fed into the particle patch. When playing an instrument like the guitar, I noticed that attributes like sustain of a note also affected the intensity of the effect since longer sound inputs extended the momentary suspension of the attractor, resulting in greater particle disruption (see fig. 18).

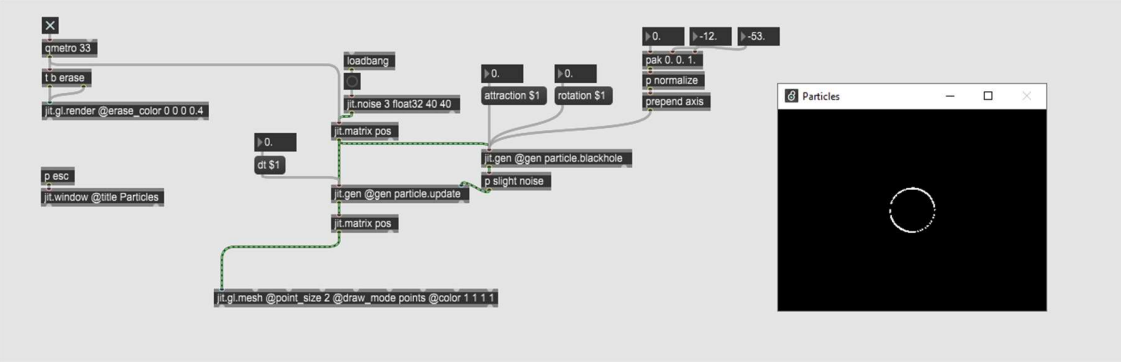

Figure 17: Particle system orbiting around axis. (Photo by Author).

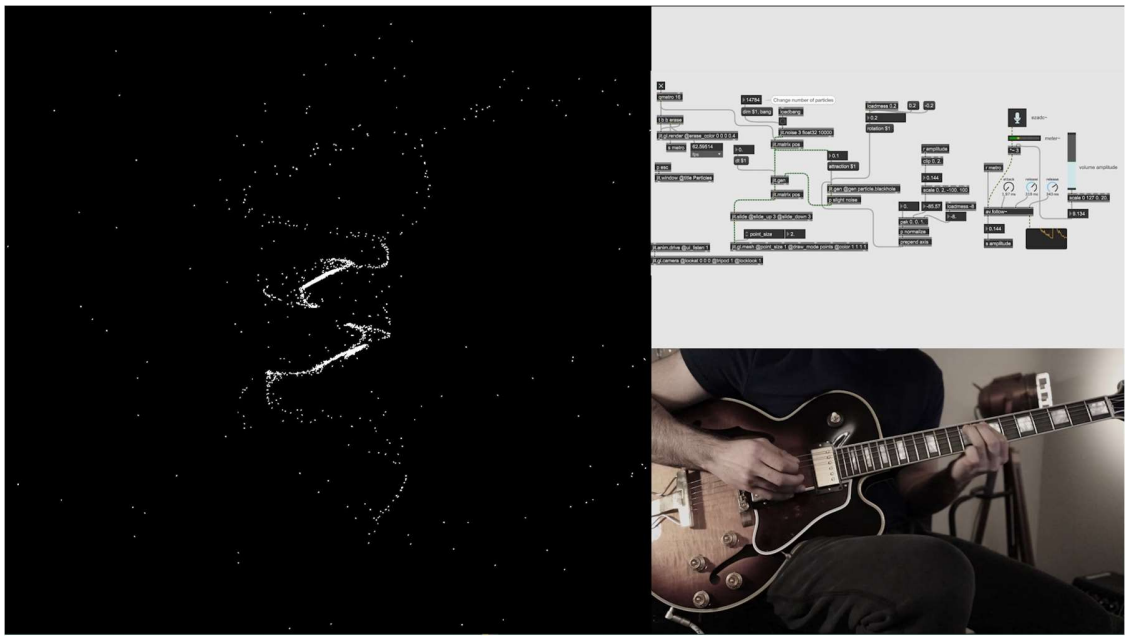

Figure 18: Sound to particle disruption with MAX MSP (Photo by Author).

This evolution of the initial CRT TV experiment captures the reactive characteristics of the CRT TV while allowing for greater control over the effect. The patch can be edited to better suit the needs of the space it is intended for.

7.2 Generative AI Based Plan

I used an artificial intelligence (AI) image generator called Midjourney to create images for abstract concepts such as “ecstatic space,” “ecstatic space created through music,” “harmony visualized,” and “rhythm visualized.” These images helped me understand and convey how these concepts can be visualized during presentations throughout the duration of this thesis. AI generators draw from the collective data across the internet and thus dive into a sort of collective consciousness which can be valuable when dealing with eccentric concepts that do not have an established conceptualization. I turned to these generated images when creating the plan for the pavilion through a novel methodology as follows:

I started with a loose intuitive process where I traced over several of these AI generated images until I discovered a sketch of a plan that had a distinct inner chamber with adjoining chambers that guided the circulation to the core (see fig. 19). I then proceeded to adopt an exploratory process where I blended this sketch with various other images to guide the direction of the AI generator’s visual language. This would become

the basis of a plan for the pavilion design. The images used to guide the AI generator were used for their visual and stylistic characteristics.

Figure 19: AI guided plan exploration. “Ecstatic space + music black and white sketch,” image generated by Midjourney.

I used the AI image generator to blend my sketch with an AI generated image which visualized “harmony” (see fig. 20). The chosen image from the resulting set was then fed into the AI generator again to be blended with an image that diagramed agrarian towns in China (see fig. 21). This resulted in a set of images that had cavernous, chambered qualities, often with a central inner sanctum. The selected image from this set was then blended with an image of an architectural plan that was curvilinear in nature, to guide the cavernous drawing into one that used architectural plan language (see fig. 22). This set of images were organic and used architectural language like poche to illustrate walls.

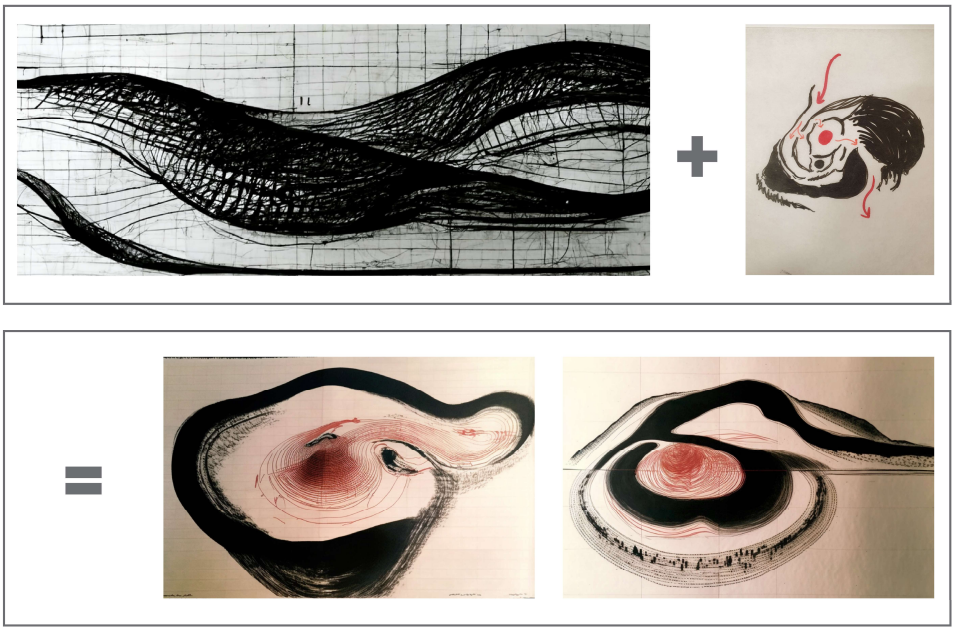

Figure 20: AI generated image combined with hand drawn image. “Harmony visualized,” image generated by Midjourney [top left].

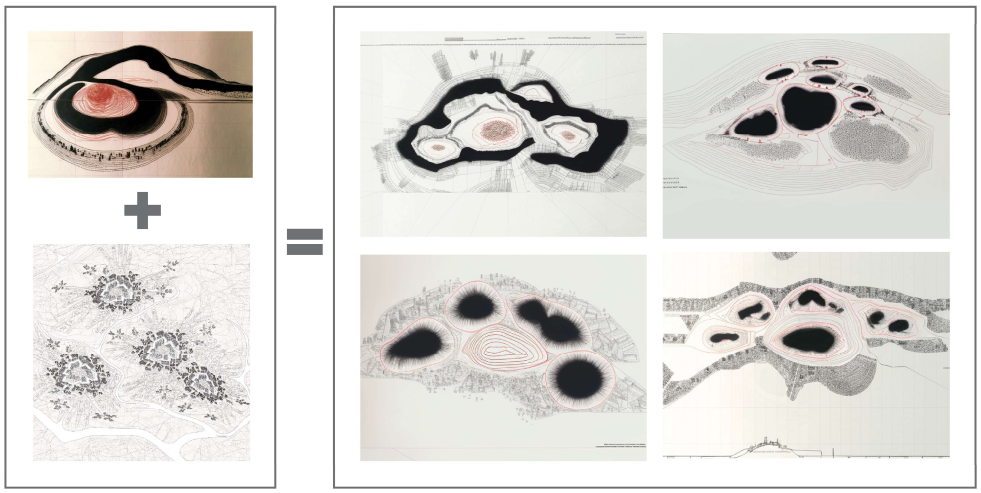

Figure 21: AI generated image combined with 50 species-towns. Charles Waldheim, *Landscape Portrait: 50 Species-Towns*, image, Som Foundation, October 14, 2020, https://somfoundation.com/events/towards-an-agrarian-urbanism-progressive-potentials-for-contemporary-practice/ [bottom left].

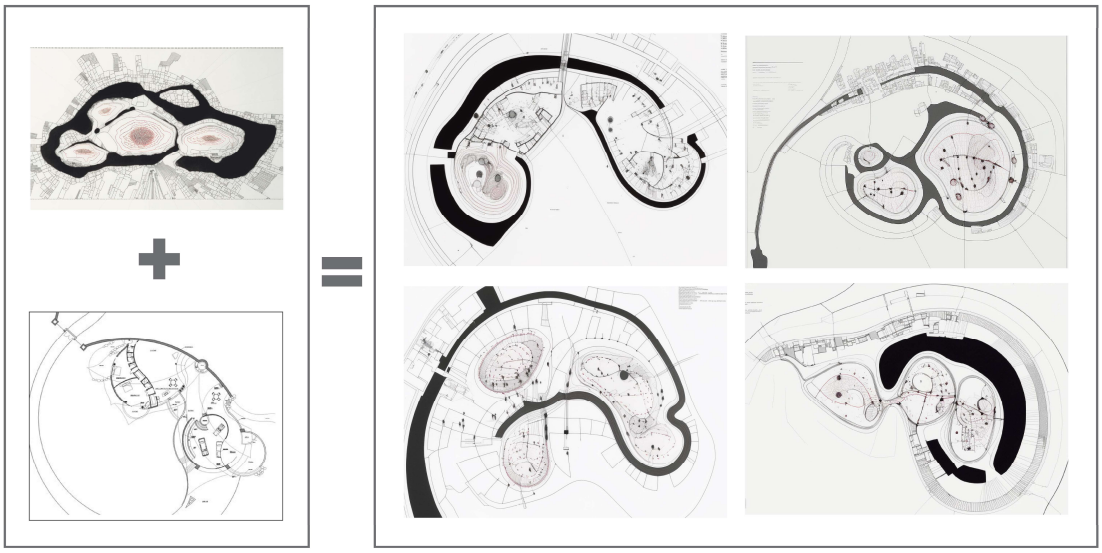

Figure 22: AI generated image combined with organic plan. *Organic plan,* image, Pinterest, https://www.pinterest.com/pin/404831454004934310/ [bottom left].

7.3 Design Union

It was difficult to ascertain what the various elements in these images meant, if they had any meaning at all. Therefore, I began analyzing the selected image and assigning meaning to it at different scales- program, wall assemblies, etc. (see fig. 23 and 24). I then began sketching sections through the plan to find the form of the pavilion (see fig. 25).

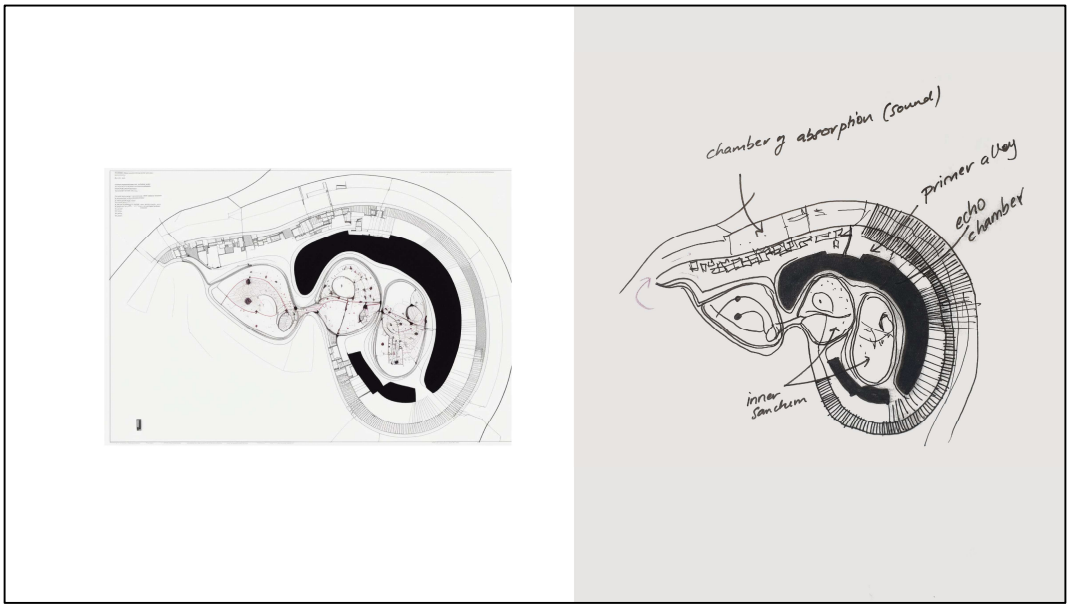

Figure 23: Sketch study – program (Photo by Author).

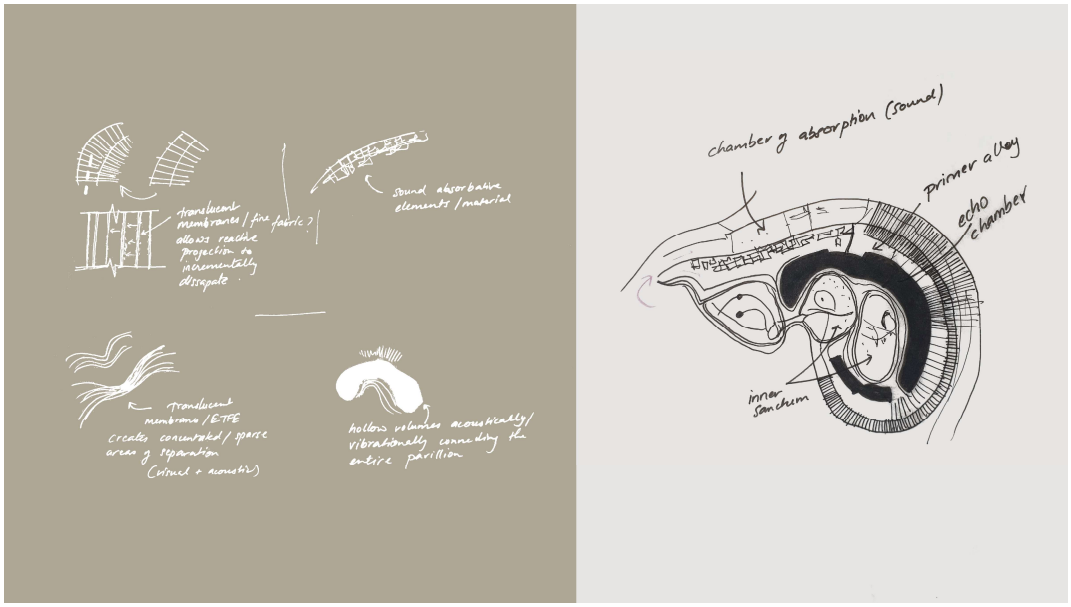

Figure 24: Sketch study – wall types (Photo by Author).

Figure 25: Sketch study – sections (Photo by Author).

The AI generated plans were developed further to include the full scope of the program. Section studies led to the creation of the form of the building which was then modeled in Rhino7. The experiments related to the audio reactive experience in MAX MSP were used as the basis for creating ecstatic experience within the structure. A system of interaction was designed that utilizes projectors, mesh screens, directional and conventional speakers, echo chambers, and sensors to create a series of experiences that together aim at creating an ecstatic space. These design decisions are described in the following section.

CHAPTER 8

DESIGN PROPOSAL

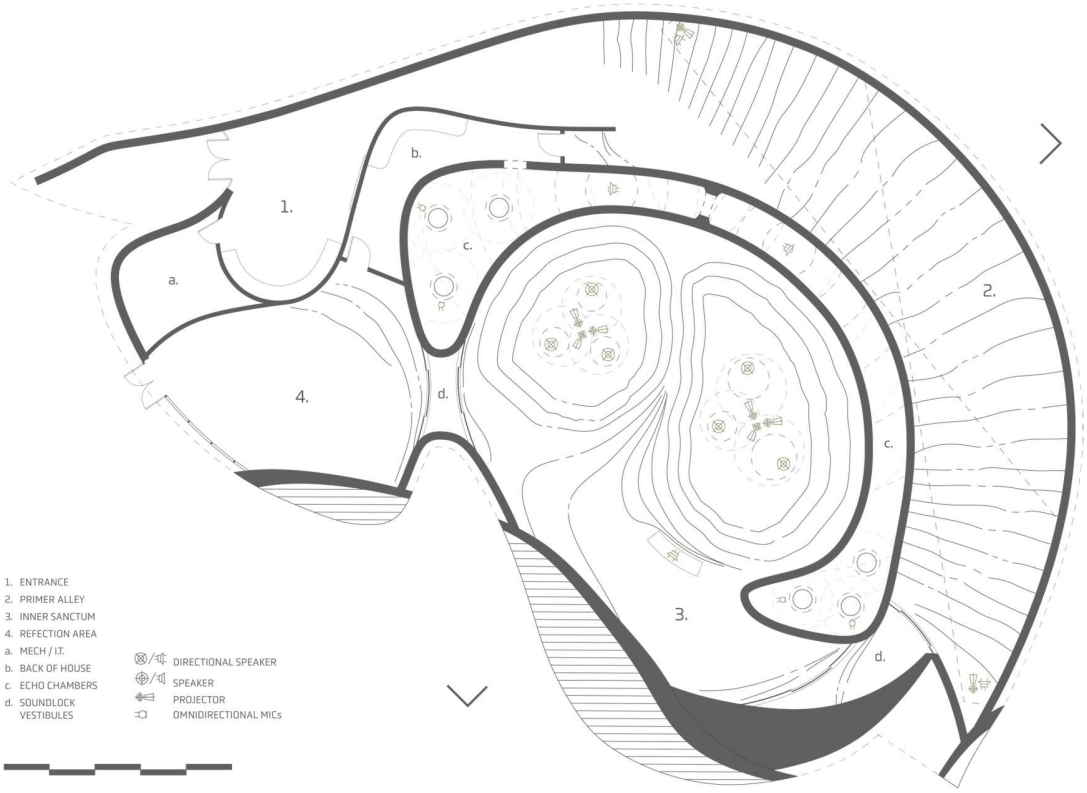

Figure 26: Plan (Photo by Author).

The final plan is oriented around the inner sanctum which contains two chambers (see fig. 26). This is an ecstatic space designed to invoke ecstatic experience through music. When users step into the chambers made of multiple layers of mesh, they have the option to engage in making music either with the instruments placed in the chambers or through their body movement which is captured by a sensor and converted to sound response through a MAX MSP patch. The music produced is played back at the users within the chamber through directional speaker mounted on the ceiling so that they alone can experience it. This sound is then fed through the audio reactive particle system patch

in MAX MSP and then the resulting particle movement is projected onto the layers of mesh that make up the chambers. In this way, the music produced affects the surrounding environment, creating the illusion of a concurrently changing architecture (see fig. 27).

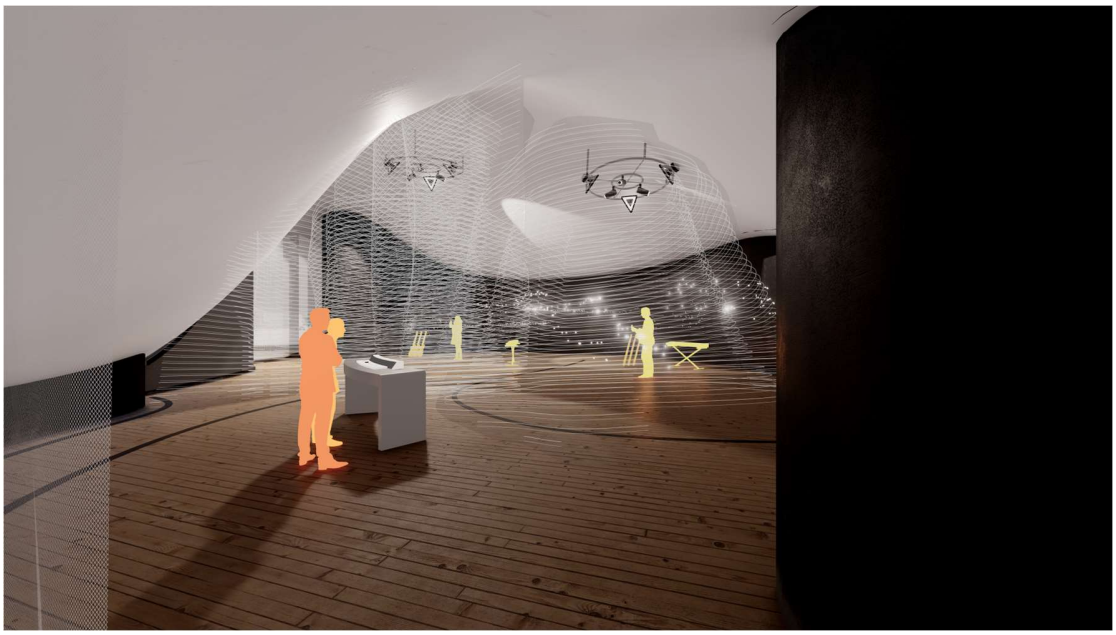

Figure 27: Inner sanctum render (Photo by Author).

The music produced in each chamber is played through speakers in two separate echo chambers (see fig. 26). The tall volume and sound diffusers scatter the sound in random patterns, creating a distinct echo which is picked up by omnidirectional microphones. The treated audio from each echo chamber is played through directional speakers from either end of the primer alley along with their distinct particle disruption projections created in the inner sanctum. Inspired by The Veiling by Bill Viola,[76] the particles are projected through a series of mesh layers from either end of the alley such that a zone of overlapping sound and projections is created. This creates an essential

[76] "Bill Viola: The Veiling."

priming effect for individuals making their way through the primer alley where they are experiencing music (obscured due to the echo effect) and its visual representation as produced in the inner sanctum. As they make their way through the alley, they are forced to interact with and move the mesh screens. Thereby exerting their own influence on the way the projections hit the mesh screens (see fig. 28). Towards the middle of the alley, they start to hear the dissonant interplay between the two sets of music and projections created in the chambers before one starts to fade away. This is an opportunity where the users can piece together the workings of the inner sanctum in their own unique way before directly influencing it from the inside.

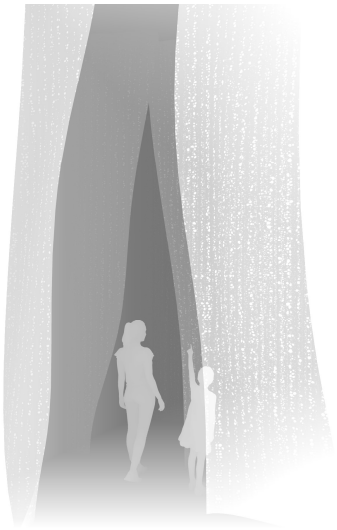

Figure 28: Primer alley concept render (Photo by Author).

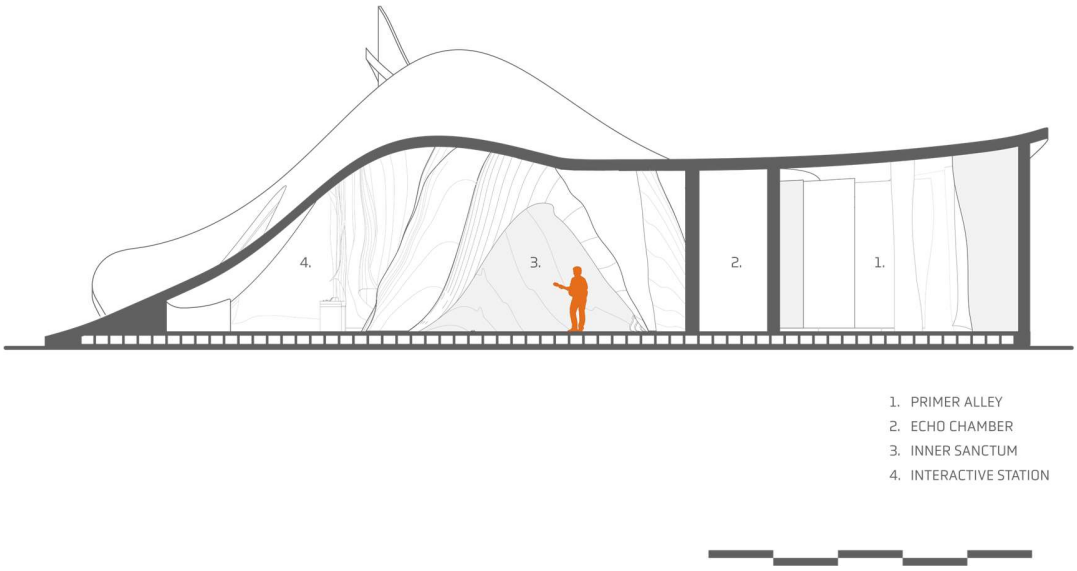

Figure 29: Section (Photo by Author).

The interactive station allows users who have made it past the primer alley to observe the activity within both the chambers as they wait for their turn in the chambers. A slider allows them to control the mix of sound coming from each chamber (see fig. 29). After experiencing the ecstatic space, the users find themselves in the reflection area (see fig. 26) which is the last stage of the experience. This is where they can recount their experience and share insights with others.

The pavilion is built using timber framing and steel connections. This allows the structure to be disassembled and consolidated for transportation. The façade and walls of the pavilion require robust sound separation to isolate from the ambient noise of the city square. The layers in the wall required to achieve this include 1/8” vulcanized rubber on the exterior to absorb impact from rain, 10” fiberglass insulation to provide thermal and acoustical isolation, timber framing for structure, ¾” resilient channels to limit the

transfer of sound vibrations from the interior into the framing, and 1/8” mass loaded vinyl to absorb sound from the interior of the pavilion (see fig. 31).

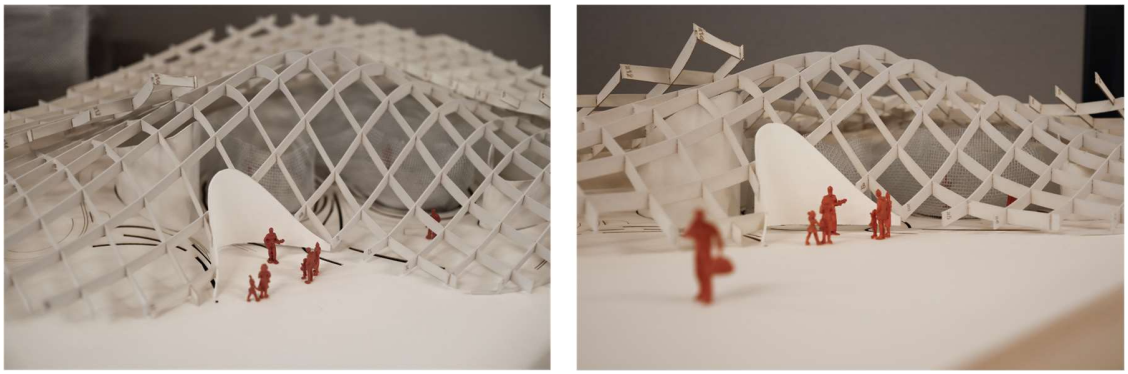

Figure 30: Physical model highlighting timber framing (Photo by Author).

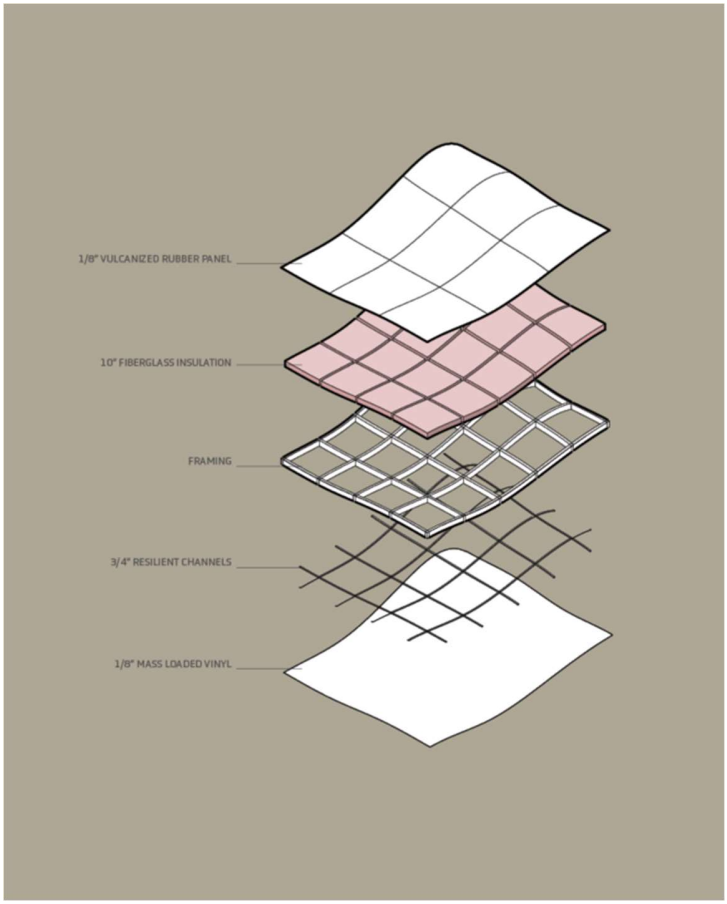

Figure 31: Exploded wall diaphragm (Photo by Author).

Figure 32: Exterior render – busker (Photo by Author).

Finally, the exterior render captures an interesting moment where LED panels are used as an interactive nook. The panels display particle projections as they respond to sound from the city square. I envision this area being used by city buskers, creating intrigue about the pavilion and engaging people in the square (see fig. 32).

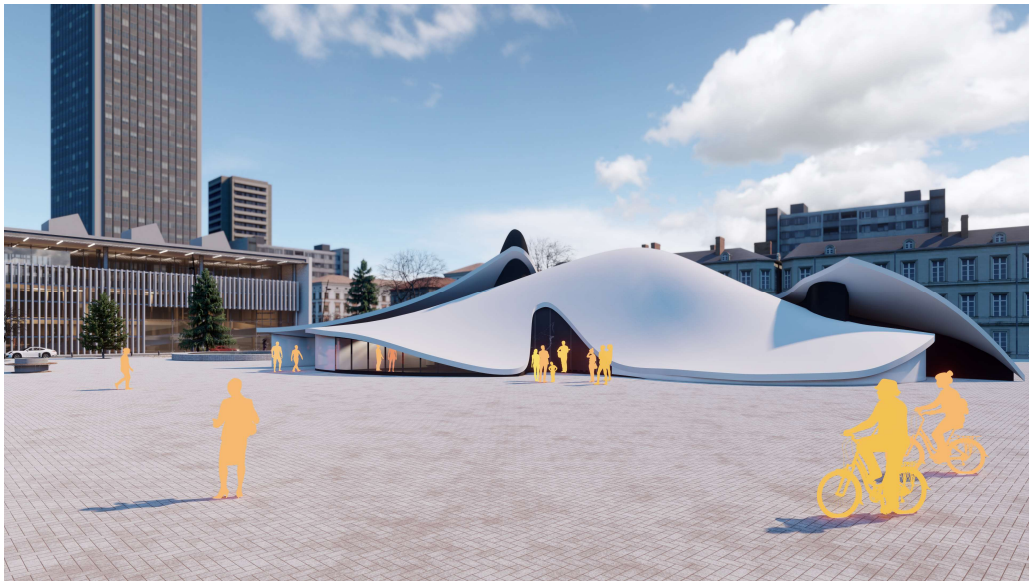

Figure 33: Exterior render (Photo by Author).

CHAPTER 9

CONCLUSION

Combining my deep passion for music and architecture for this thesis has been a rewarding experience. The tools used in this thesis, such as Midjourney, allowed me to push the form and experience of this pavilion in an unchartered direction. It forced me to conceptualize space in an unusual way which was appropriate for this design. MAX MSP's generative and interactive influence on the experience allows the users to exert their influence onto the way their environment manifests without the need for tectonic change. The influence of the shamanic conception of space allowed me to reinterpret design priorities and truly think in terms of creating ecstatic experiences.

Some limitations of this thesis include the fact that ecstatic spaces, like music and architecture, are subjective; there is no space that can elicit ecstatic experiences for everyone. Furthermore, overreliance on tools like AI can hinder the design process since it cannot effectively take into consideration the numerous factors that need to be accounted for while designing. Therefore, it is best used as a generative tool for abstract ideas that can then be tested and further developed by the architect. The shamanic conceptions of space are not always compatible with the practical requirements of architecture. They can be advantageous in designing experience-centered architecture but cannot replace the Rationalist conception of space. Overall, the tools used in this thesis can be valuable when used appropriately.

BIBLIOGRAPHY

Book, Amber. “Architectural Acoustics 2 of 4: Sound Absorption Coefficient and Noise Reduction Coefficient,” YouTube. July 25, 2014, https://www.youtube.com/watch?v=ysdfoA-t1aA.

Bourguignon, Erika and Louanna Pettay, “Spirit Possession, Trance, and Cross-Cultural Research," *Transcultural Psychiatric Research Review and Newsletter* 2, no. 1 (April 1965): 13-15, https://doi.org/10.1177/136346156500200105.

Clarke, Joseph. “Iannis Xenakis and the Philips Pavilion.” *The Journal of Architecture* 17, no. 2 (2012): 213–29.Apple Podcasts. “The Emerald: How Trance States Shape the World on Apple Podcasts.” Accessed December 27, 2022. https://podcasts.apple.com/jm/podcast/how-trance-states-shape-the-world/id1465445746?i=1000512752303.

Cumes, David. *Africa in My Bones: A Surgeon’s Odyssey Into the Spirit World of African Healing*. New Africa Books, 2004.

Durth, Werner, and Roland May. “Schinkel’s Order: Rationalist Tendencies in German Architecture,” 2007. https://onlinelibrary.wiley.com/doi/abs/10.1002/ad.514.

Enrico, “Philip Beesley: Hylozoic Groud. Canadian Pavlivion at ARchitecture Biennale Venice 2010/ Interview,” Vernissage TV, September 10, 2010, https://vernissage.tv/2010/09/10/philip-beesley-hylozoic-ground-canadian-pavilion-at-architecture-biennale-venice-2010-interview/

Evans, Jules. “Ten Principles for Making Sense of Ecstatic Experiences.” *Age of Awareness* (blog), April 26, 2022. https://medium.com/age-of-awareness/we-need-better-cultural-resources-to-make-sense-of-ecstatic-experiences-d26a68dad47e.

Evans, Robin. *Translations from Drawing to Building*. AA Documents: 2. MIT Press, 1997.

Frankl, Viktor E. “Self-Transcendence as a Human Phenomenon.” *Journal of Humanistic Psychology* 6, no. 2 (April 1966): 97–106. https://doi.org/10.1177/002216786600600201.

Gabrielsson, Alf, and Siv Lindström Wik. “Strong Experiences Related to Music: Adescriptive System.” *Musicae Scientiae* 7, no. 2 (September 2003): 157–217. https://doi.org/10.1177/102986490300700201.

Glenister Robers, Kathleen, Ya-hui Irenna Chang, and Łukasz Matuszyk. *A Body Living and Not Measurable: How Bodies Are Constructed, Scripted and Performed Through Time and Space*. Boston, United States: Brill, 2019. http://ebookcentral.proquest.com/lib/uma/detail.action?docID=6481663.

Goldman, Alan. “The Value of Music.” *The Journal of Aesthetics and Art Criticism* 50, no. 1 (1992): 35–44. https://doi.org/10.2307/431065.

Gudkova, T. V., and A. A. Gudkov. “Spatial Modernist Architectural Artistic Concepts.” *IOP Conference Series: Materials Science and Engineering* 262, no. 1 (November 2017): 012152. https://doi.org/10.1088/1757-899X/262/1/012152.

Harrington, Ann. “Thinking About Trance Over a Century: The Making of a Set of Impasses,” in *Hypnosis and Mediation: Towards an Integrative Science of Conscious Planes*, ed. Michael Lifshitz and Amir Raz (New York: Oxford University Press, 2016), 2.

Herr, Christopher R., and Gary W. Siebein. “An Acoustical History of Theaters and Concert Halls: An Investigation of Parallel Developments in Music, Performance Spaces, and the Orchestra.” Accessed June 5, 2022. http://docplayer.net/43957589-An-acoustical-history-of-theaters-and-concert-halls-an-investigation-of-parallel-developments-in-music-performance-spaces-and-the-orchestra.html.

Huang, Siu-Chi. “Musical Art in Early Confucian Philosophy.” *Philosophy East and West* 13, no. 1 (1963): 49–60. https://doi.org/10.2307/1396785.

Krell, David Farrell. *Architecture: Ecstasies of Space, Time, and the Human Body*. SUNY Press, 1997.

Marks, Robert W. “The Music and Musical Instruments of Ancient China.” *The Musical Quarterly* 18, no. 4 (1932): 593–607.

Matanski, Viktor. “Formation of Chladni Patterns in Virtual Environment.” *Formation of Chladni Patterns in Virtual Environment*, January 1, 2017. https://www.academia.edu/43837083/FORMATION_OF_CHLADNI_PATTERNS_IN_VIRTUAL_ENVIRONMENT.

McGowan, John, Grégory Leplâtre, and Iain McGregor. “Exploring Musical Creativity through Interactive Cymatics,” July 1, 2017. https://doi.org/10.14236/ewic/HCI2017.67.

Mills, Simon. “Sounds to Soothe the Soul: Music and Bereavement in a Traditional South Korean Death Ritual.” *Mortality* 17, no. 2 (May 2012): 145–57. https://doi.org/10.1080/13576275.2012.675231.

Owsinski, Bobby. “Inside The Abbey Road Echo Chambers.” Bobby Owsinski’s Music Production Blog, January 7, 2020. https://bobbyowsinskiblog.com/abbey-road-echo-chambers/.

Panzarella, Robert. “The Phenomenology of Aesthetic Peak Experiences.” *Journal of Humanistic Psychology* 20, no. 1 (January 1980): 69–85. https://doi.org/10.1177/002216788002000105.

Reimer, Bennett. “The Experience of Profundity in Music.” *Journal of Aesthetic Education* 29, no. 4 (1995): 1–21. https://doi.org/10.2307/3333288.

Run, Mao Yu. “Music under Mao, Its Background and Aftermath.” *Asian Music* 22, no. 2 (1991): 97–125. https://doi.org/10.2307/834309.

Song, Haein. *Ecstatic Space: NEO-KUT and Shamanic Technologies*. Brunel University London, 2019.

Sparshott, Francis. “Aesthetics of Music: Limits and Grounds.” *What Is Music*, 1987, 33–98.

Spatial Music Form, “Le Corbusier / Varèse / Xenakis,” YouTube, May 13, 2021, educational video, https://www.youtube.com/watch?v=P-a5UUiyyWY.

“Stretto House,” Steven Holl Architects, June 27, 2017, https://www.stevenholl.com/project/stretto-house/.

Tantacrul, “Musical Elitism Is Everywhere,” YouTube. April 8, 2022, Educational video. https://www.youtube.com/watch?v=azpxUnIgsts.

The Fabric Workshop and Museum. “Bill Viola: The Veiling.” Accessed April 27, 2023. https://fabricworkshopandmuseum.org/exhibition/bill-viola-the-veiling/.

Tschumi, Bernard. *The Manhatten Transcripts*. Academy Editions, 1981.

Ungersma, A. J. *The Search for Meaning*. The Search for Meaning. Oxford, England: Westminster, 1961.

White, David A. “Toward a Theory of Profundity in Music.” *The Journal of Aesthetics and Art Criticism* 50, no. 1 (1992): 23–34. https://doi.org/10.2307/431064.

“Zulu Sangoma," Eshowe: the Heart of Zululand, accessed April 24, 2023, https://eshowe.com/zulu-sangoma/z.