A Phenomenological Approach to Performance Architecture Through Light and Acoustics

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A Phenomenological Approach to Performance Architecture

Through Light and Acoustics
A Phenomenological Approach to Performance Architecture
Through Light and Acoustics

Request for Approval of Thesis Research
Project Book Presented to:

Selen Okcu

and to the
Faculty of the Department of Architecture
College of Architecture and Construction Management

by

Debora Bree Chambers

In partial fulfillment of the requirements for the Degree

Bachelor of Architecture

Kennesaw State University
Marietta, Georgia

May 1, 2020
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DEDICATION

This thesis is dedicated to my friends that took me to my first festival, my first rave, and my first Illenium show. Thank you for sharing moments with me that inspired this thesis. Thank you for the late night company in studio, sharing beautiful music with me, drinking hot coffee, and nights filled with dancing.

To the R.E.A.L ones, Thank you for believing in me when I doubted my own abilities. Thank you for helping me become, me. I am truly grateful to have spent 5 years journeying through this program with friends and brothers and sisters I will know and care for forever.
ACKNOWLEDGMENT

This Thesis would not be possible without the guidance and support of my thesis advisor, friends, and family:

Professor Okcu, thank you for sharing your knowledge on acoustics, and guiding me through this project. Thank you for your commitment and encouraging me through this process.

Family, thank you for supporting my ambitions and being their for support. Special thanks to my father, for whom without I wouldn’t be able to focus my energy solely on the development of this Thesis and building the foundation of my future.

Friends and Brothers of Alpha Rho Chi, thank you for your support and encouragement during these 5 years, through the fun and stressful times. Thank you for being a part of my journey and pushing me to pursue my dreams.

Faculty and staff at Kennesaw State University, thank you for your guidance during my education and the opportunity to gain a degree in the profession of Architecture. Thank you for pushing and critiquing my projects further.
Throughout history, performances, the fine arts, and music have brought society together to persuade, inspire, and bring to light the pressing issues of their time. The Roman's used the coliseum to distract their people with games and spectacles from political instability and famine. The Greeks performed in open amphitheaters to communicate tragic stories of morality. I want to influence the entertainment of our time, that is music festivals, from America's first 1954 Newport Jazz Festival in Rhode Island to 1969 The Woodstock Aquarian exposition reported 500,000 people in attendance. Festivals are an escape from a conventional society into a counterculture that brings the community together to celebrate peace, love, and music. Music is still the root of bringing people together but there is an opportunity for architects to shape this interaction. I'm not reinventing the wheel but rather introducing spatial configurations that dissolves the boundaries between the audience and the performer based on the experience.

My research seeks to discover the phenomenology of light and acoustics through performance architecture. Through expressions of light, color, and sound an architecture can be programmed to increase social interaction and create a multi-sensory experience. Sound and light are vibrations that inflect our emotions. Architecture is a space that contains or can even create sound. By researching how different colors and vibrations travel through space, we can adjust these frequencies so we can tune the cognition in society for a transcendent experience. By selecting a site that offers natural geographic scenery, we can design an immersive musical experience with the natural landscape. The canyons in Utah feature natural phenomenons of light and sound. The alcoves in the canyons have a natural acoustic quality of echo and reverberation. A unique experience can be designed for the attendees to explore the space by programing the alcoves for collective making through music. Programing architectural surfaces for music production starts to dissolve this boundary between the attendee and performer to fully engage the community through architecture and music.

Festival grounds tend to be scattered with no cohesiveness. Campers and multiple stages sprawl along the grounds and leave a lot of waste. This is an opportunity for architects to design a more systematic approach for an outdoor concert experience. New usage of materials and assembly process will construct a structure that doesn't impede on the natural environment. Modular living accommodations can be assembled for less waste and space. The idea of 'main stage' can be fragmented into sub-stages that can be assembled so it can form different configurations and different experiences each year and adapt based on the size of the audience. Acoustic shells and clouds will work harmoniously for a better acoustic experience for large audiences with attention to echo and reverberation based on the performer. My thesis aims to create an architecture as an instrument to bridge the gap between cultures and to connect, influence, and progress society through art and music. By designing with a phenomenological approach, a musical experience can be reconfigured every year for spiritual serenity in the natural landscape.
A PHENOMENOLOGICAL APPROACH TO PERFORMANCE ARCHITECTURE THROUGH LIGHT AND ACOUSTICS
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THEOREM
1.1 Architecture As An Instrument

How can ARCHITECTURE be an instrument to gather and inspire society through MUSIC and ART?

A Festival Experience is an opportunity for people to escape the routine of everyday life. Music and Art are the programs used to construct an immersive nomadic experience in the natural landscape. The design and scale of the architecture has an impression on the attendee based on what they perceive. Through the design of the pathways, nodes, and destinations architecture can be a part of orchestrating their experience.
AN ARCHITECTURE THAT AIMS TO GATHER CONNECT AND INFLUENCE SOCIETY THROUGH ART AND MUSIC

 Randy vs. Urban

 SITE

 Geographical Scenery

 Walkability | Transportation

 Vertical Market

 Performance Space

 Social Hub

 Experiential Zones | Installations

 Living Accommodations

 Indoor and Outdoor Connectivity

 Light and Shadow

 Materiality

 SPATIAL EXPERIENCE

 Physical vs. Spiritual

 Aesthetics Based on Program of Form

 Elasticity of Enclosure

 ASSEMBLY

 Modular

 Natural Light & Acquisition

 Economic

 FIGURE 6

 FIGURE 7

 FIGURE 2

 FIGURE 3

 FIGURE 4

 FIGURE 8

 FIGURE 9

 FIGURE 10

 FIGURE 11

 FIGURE 12

 FIGURE 13

 FIGURE 14

 FIGURE 15
1.2 WHAT IS PHENOMENOLOGY?

A phenomenological approach to architecture is designed with the intent to create a sensory experience through the manipulation of space, material, and light. The space can be designed for people to perceive their reality versus the experience of reality. The value of hum

What is reality?
It can be defined by the quality or state of something’s existence or the state of being. The quality is varied based on the perception of the subject because each subject is conditioned to their sensibility. The reality the subject is perceiving is one of many points of views within the space. Moving throughout the space creates different perspectives narrating a journey for a memorable experience.

What makes an experience memorable?
Forms are generated from configuring programs for human activity. The programs are interactive to create a bond between people or in relation to site context. The Exploration of material allows for natural light to be celebrated or create shadows.

MANIPULATION OF SPACE

MANIPULATION OF MATERIALITY

MANIPULATION OF LIGHT
1.3 PERCEIVING SPACE

How can a SPACE make you FEEL something?

Architecture is designed to function for society. Every person is a subject perceiving an experience. The experience meaning, the world, life, a place, an event, a painting, a structure, or all of the above. Every experience is constructed by the plan of the architect. People circulate within a space designed with the intention of creating a memorable experience for the human phenomena. The relationship between the person perceiving their environment transcends to the spirit when their senses are triggered. A phenomenological approach to architecture is the manipulation of space, sound, light and shadow, and materiality. The configuration of spaces creates different paths and points of view. Paths are generated to flow between nodes programmed for the human to experience for their own self discovery or engaged with the community. A series of events can be sequenced together to form an experience with different iterations or a defined outcome. The space is a part of creating the journey the person has while traveling through the configured space.

Sound is projected, absorbed, and reflected based on the source of the subject’s position and the manipulation of the space confining the sound. Surfaces are convexed and concaved to project sound waves in a desired direction. The materiality used has different absorptive and reflective properties of sound and light. Some surfaces can have textures that engage the senses.

How do you engage the senses?

A sensory experience is designed with a phenomenological approach. “The senses are gateways to the intelligence. There is nothing in the intelligence which did not first pass through the senses.” (Aristotle) The senses are able to be triggered by different parts of the human construct.

### Touch
The Somatosensory perception resulting from attraction of neural receptors, skin-hair follicles, variety of pressure receptors responding to variations of pressure.

### Site
The vision that allows us to focus and detect images of light and generate electrical nerve pulses for colors, hues, and brightness.

### Taste
The Gestation and ability to detect Sweet, Bitter, Sour, Salty, and Umami for substances such as food, minerals, poisons, etc.

### Hearing
The audition and ability to perceive sounds by detecting vibrations. The brain then interprets, recognizes and differentiates different pressures of your surrounds.

### Smell
The faction and ability to detect scent, chemical, and odor molecules in the air. The nose houses hundred of olfactory receptors that are coded but not completely understood.

### Proprioception
The understanding that you have a position in a space and that you understand you can use your body parts in relation to your surroundings to make a movement.

### Vestibular
The Perception of the body, and the ability for us to think to bring action within a space to know gravity, movement, and balance.

While sensations and impressions quietly engage us in the physical phenomena of architecture, the generative force lies in the intentions behind it” (Holl, Pallasmaa, and Perez-Gomez 41)
Light and sound are waves that travel through a space. The space can be defined by surfaces, walls, trees, or other extrusions in the natural landscape. The density of the surface determines the material’s absorptive or reflective properties. The way to control reflective rays is by controlling the geometry. Every sound and light wave exerted is controlled by the angle of the source. Concaving a surface projects reflective light and sound waves evenly for anti-focusing. This creates a harmonic sound with the music or results in a ray of light rather than a direct spotlight.
1.4 SPATIAL ANALYSIS

Reflected Light and Acoustic Analysis

 Incident Ray
The plane mirror or any other surface that produces a reflected image

Reflected Ray

Regular Reflection

Convex and Concave Reflection

Convex Reflection

Convex Reflection

Incident Ray

Any surface that is visible but does not reflect an image.

Reflected Ray

Diffused Reflection

Concave Reflection

Concave Reflection
1.4 SPATIAL ANALYSIS

7 Spatial Organization

Centralized
Central domain with secondary spaces grouped around.

Linear
A linear sequence of repetitive spaces.

Radial
Central domain with secondary spaces grouped in a radial manner.

Cluster
Spaces grouped by proximity or the sharing of a common visual trait or relationship.

Grid
Spaces organized within the field of a structural or other 3-dimensional grid.

Stage Types

Thrust Stage

Proscenium Stage

In The Round

Amphitheater | Open Air

Traverse

Black-box
1.5 PERSPECTIVE AND PROPORTIONS

Essay on Proportions:
Gothic style is a western Christian Architecture, often called “the age of faith”. Gothic Architecture aimed for an understanding of existence for man. In the cathedral the dematerialization interacted with the light to illuminate the world with divine meaning. The darkness of the Romanesque church was out-shined by the Gothic style. The form was defined as “spiritualized matter” that gave clarity and understanding of the totality of the creation we are all in. Man is just a part of the whole divine creation and faith was the reason for understanding. The Renaissance was the rebirth of the darkness in the middle ages. Brunelleschi’s buildings were symmetrical with geometrical order, expressive of harmony and perfection. Architecture was a mathematical creation of numbers, man used to define the order of the cosmos. Proportions were in relation to the human body for harmony and perfection within the buildings. Medieval theology taught that truth could be sought through the bible and the afterlife awaited a more significant life. In contrast, the humanist believed man was the measure of all things. The Renaissance faith and spirituality was expressed with art. Mathematical harmonies of the structure where proportioned to the human body to create a new visual reality. Each building was built in thought of the overall composition of Florence. The urban scape was created with proportioned buildings in ratio of each other. The proportions achieved harmony within it’s composition just as musicians notes harmonize to create a chord. The father of the Renaissance, Filippo Brunelleschi, combined form and architecture practice in Florence. Medieval governmental buildings where located at the cities core and an open space or piazzas surrounded the building. This urbanism spread in Europe and renaissance architects designed with whole number ratios stemmed from music consonances discovered by Pythagoras like 1:1, 1:2, 2:3, and 3:4. The church was circular with perfect form to celebrate harmony. The simple forms, circle and square, were encompassing the human body in the Vitruvian Man by Leonardo da Vinci to reflect humans were of divine ratios as well and influenced Italian Architecture. Brunelleschi set the standard for proportional systems in building. Columns, pilasters, and entablatures with proportioned widths and heights made up the Pazzi Chapel and other buildings. Facades became flatter and vertical dimensions where communicative to horizontal. He was inspired by the Ten Books on Architecture to create his own understanding of logic expressed through buildings. The architect was clearly defined from the craftsman through drawings, some where never even built.
1.5.1 PERCEIVING RENAISSANCE ARCHITECTURE

Essay on Perceiving Renaissance Architecture and Reality:
Renaissance architecture forms can be broken down by the simpler geometries, the square and circle. The architecture is constructed in proportion to the human body. The scope of the renaissance may be understood as the start of the economy and trade routes, or the age of Gothic architecture, or is known as the progressive culture with art. The Gothic church was the symbol of light. Early christian churches receive light, but only the interior surface is influenced by it. Slowly however the interaction became more profound by windows, and as time passed, even more massive was absorbed by light. The semi darkness of the Romanesque church gave way to the vision of light.”(pg 22, 109) The Gothic form was not simple; it had a differentiated, hierarchical and integrative form of medieval architecture that was replaced with Brunelleschi’s symmetrical spaces defined by simple forms, the square and circle. New geometrical order was in use. Harmony of proportions in the building scale was designed to scale with the human body depicted as the Vitruvius man. “Renaissance artists thus found a key to the harmony which is intrinsic to all creation. Their works were experienced as simultaneously cosmic and human. Thus we understand their aversion again medieval verticalism.”(pg 27, 113) The Renaissance faith and spirituality was expressed with art. Every creation was an attempt to understand the human phenomena and it’s function or purpose. Mathematical harmonies of the structure where proportioned to the human body to create a new visual reality. “The spirit of these revolutionary works was derived form the new world view of humanism, which celebrated rationality and mankind’s ability to make and act upon empirical observations of the physical world. Humanist scholars and artists created classical Greek and Roman texts and aspired to create a modern world reviving that of the ancients.”(Pg 30, 295) Humanist believed that God’s cosmic order could be expressed in the physical world through mathematical proportions related to the human body.

The Italian Renaissance was impacted by the Italian’s new position in the global economy. Italy became the driving cultural force of Europe. “The Italians may not have had power in an overt way, for the Holy Roman Empire was still in the north, but by investing their newly found wealth in art and learning.”(1400CE, pg 34) Venice was leading the gold market and was the main international port. Architects were able to travel to other countries to gain knowledge of city planning, construction methods, the arts, or other valuable knowledge or techniques. Florence began the banking system to have a common currency that the world would start to follow. Architecture wasn’t just the “rebirth” of art and architecture, the economy was booming and created a large impact on the world and resulted in a new culture. “Whereas the discovery of painting provides a relatively clear mask between the middle ages and the Renaissance, the difference in architecture is less obvious. Medieval practices continued to intermingle with classically inspired ideas for a century.” Renaissance architecture is thus just as much about changes in practice as in the emerging theorizing of the discipline.”(pg 36, 448) “It was not until the sixteenth century that the perception of a continuity with the post-classical past was explicitly defined by writers a “Renaissance,” and set into a special relationship with art.” (pg 277) The humanist in the fourteenth century defined the Renaissance as a time to reveal the light that was extinguished in the medieval ages and be reborn but others define Gothic Architecture as a symbol of light. These discoveries and definitions contradict each other and that is why it’s important to gather perspectives from more than one source to understand its entirety. The Renaissance was not just the simpler forms and proportions used in Architecture. The Renaissance was a cultural movement that was a humanist perspective of life demonstrated through art perspectives. Renaissance architects were a part of constructing the reality people were peering at that time and for future generations to reflect on. Every person’s reality is varied based on their point of view during a fragment of time. By researching different angles or moving to a new point, the perception of reality can change. The past can only be perceived by what exists today to be observed, whether that be text, art, or architecture. Today’s generation perceives only what past generations have recorded or is discovered through observation and analysis of a subject.
1.5.2 PERCEIVING BAROQUE ARCHITECTURE

Essay On Baroque Architecture:

Baroque architecture of the 17th century evolved from the Classical norm as a response during the Counter Reformation. Baroque architecture was a psychological response expressed through rhythmic movement and dramatized effects of color and lighting in a space. The control of nature sparked the Scientific Revolution to understand the ordered geometry of the universe. Spiritual, scientific, cultural, and political changes were in effect as new knowledge surfaced during the Counter Reformation.

Baroque as a style of Architecture was a psychological response to revitalize Rome as the center of Catholicism during the Counter Reformation. In 1517, the Protestant Reformation begins in Wittenberg, Germany with Martin Luther nailing the 95 Thesis on the church door entry. The tradition of confession was to pay to the church for your indulgences. On Reformation day Luther states that God shows mercy based on your internal spirituality and sins are forgivable, negating the pope’s traditional clergy fees for repentance. In 1545, The Council of Trent declared art as the force to spread the teachings of the church. The church commissioned artists to express the rewards of faith in their paintings, sculptures, and buildings. Art and architectural were used as tools for political and religious monarchical power “for persuasion and propagation”

Baroque architecture was emphasized with dramatic detail in 3 dimension and created movement within the space. “The theory of motion, it has been said, was the keystone to the seventeenth century science; it was both exuberant motion and exalter spirituality that gave to much of Baroque art its distinctive nature”(Trachtenberg and Hyman, 327) Movement was encompassed through exaggerated expressions like the eclipse. Changes in science from Kepler informed us of the path of planetary motion is in the shape of an eclipse rather than a circle. Man also knew it was no longer the center of the universe as assumed and the Earth orbited the sun. Architectural ingenuity worked through the senses by developing geometries of rhythmic movement with the use of the oval. This intensified the visual dynamics of the space to interpret the mysteries of faith in the church. “Movement, accent, and energy replaced Renaissance balance because they corresponded to the emotional currents with which Baroque art was charged.”(Trachtenberg and Hyman, 334) The oval was dramatically expressed in Bernini’s piazza for St. Peter’s. The entry of the piazza is surrounded by a colonnade that creates an enclosure for the faithful by “the motherly arms of the church”

Architecture, sculpture, and paintings were integrated “to create and dissolve physical boundaries” by “spatial complexity and drama created by light from undisclosed sources.”(Norberg-Schulz, 353) “Unlike the medieval cathedrals where stained glass filtered and modulated the light coming into the nave, baroque windows were of plain glass and devoid of any tracery. Light had to blend in with the architecture and illuminate certain areas. It was not blinding light but rather a mysterious and diffuse light”(Jarzombek, Mark M, Ching, and Prakash, 503) The Cornaro Chapel, Sta. Maria della Vittoria, designed by Gianlorenzo Bernini in Rome was a multimedia architecture of sculpture, architecture, painting, and stage craft as a response for the Counter Reformation. The niche served as a stage and was crowned with a broken pediment. The ceiling was a painting depicting the heavens and featured natural sunlight through the window “to enhance the illusion of celestial light.”(Trachtenberg and Hyman, 332) Intense colors were used towards the ceiling to bring emphasis in the upward direction. This multi media complex created a dramatized space to keep the faith of worshipers and make the presence of God known.

The search for meaning and truth prevailed in the seventeenth century through scientific discoveries. A search for a method that clarified what was ‘truth’ sparked the Scientific Revolution. A turning point in the seventeenth century changed people’s perspective of the world and religion. Art and Architecture tried its best to keep the faith but common sense of perception and motion brought new concepts of divine order and understanding of the Earth.
1.5.3 GLASS PAVILION | BRUNO TAUT | 1914

Expressionism evokes moods and ideas through an emotional experience rather than physical reality through distortion and fragmentation of movement. Bruno Taut designed the Glass Pavilion for the Cologne Deutscher Werkbund Exhibit in 1914. It was a prismatic glass dome with 2 layers of colored glass on the inside and reflective glass on the outside. The facades colored glass plates acted as mirrors and was the “little temple of beauty” was described as “reflections of light whose colors began at the base with a dark blue and rose up through moss green and golden yellow to culminate at the top in a luminous pale yellow.”
1.5.4 SOUND FORMS | OLYMPIC PARK, LONDON | JOHN GAFFEN

"Designed from the inside out, this shell will allow the performers to hear one another, radically improving the quality of their performance. The shell’s dynamic and organic form delivers unparalleled acoustic projection – initial tests indicate a significant improvement in the broadcast quality of the sound produced for both performers and audience."

3D Printed Model of Armature
Festival grounds tend to be scattered with no cohesiveness. Campers and multiple stages sprawl along the grounds and leave a lot of waste. This is an opportunity for architects to design a more systematic approach for an outdoor concert experience.
MUSIC FESTIVAL
SPATIAL ANALYSIS
Bonaroo Festival is set on the Farm. The grounds feel open and free no matter your location. Throughout the years, Bonnaroo has increased its camping and experiences. Some stages have upgraded from tents to large stages. More people are willing to pay for a VIP experience, so Bonnaroo has expanded. Late night musical experiences, like "Where in the Woods" made it’s debut in the campgrounds 2019. Bonnaroo programs each campground plaza with it’s own theme curated by musicians, local artist, or bonnaroovians.
2.1 PROGRAM AND SPATIAL ANALYSIS

Camping Grounds

Center Roo

- SITE
- AUDIENCE
- BOH
- VENDORS
- CAMPING
- PLAZA | PODS

SCALE: 1' = 1/1000"

KALLOIPE EXPERIENTIAL SECTION DIAGRAM

FESTIVAL SPATIAL ORGANIZATION

Ticket Price: $274-$2000
Festival Date: Early June
Camping Space: 400 SQ-FT
Attendance: 80,000 People
Stage: 13,950 SQ-FT
Stage | Audience Ratio: 1:55
2.1 BONNAROO CAMPING

ARIAL VIEW OF CAMPING

FIGURE 20

FIGURE 21

FRIENDS THAT CAMP TOGETHER

CAMPING SET UP

SCALE: 1’ = 1/32”

CAMPING ALONE

CAMPING PLAZA

FIGURE 22

FIGURE 23
2.1 BONNAROO FESTIVAL | MANCHESTER, TENNESSEE

Bonnaroo Music Festival is a camping festival on a 700 acre farm. It started in 2002 and continues today connecting thousands of people around the world for four days. It is an endless adventure of discovery and human connection. Bonnaroo aspires to be the greenest festival, practicing sustainability and green practices. Workshops are hosted to educate attendees on environmental issues and gardening in Planet Roo. BONNAROO promotes positivity and maintains this image by respecting it's surroundings and keeping the Farm clean. Every corner there are wasteland, recycling, and Compost trashcans with workers maintaining the grounds. Taking it to the next level, Bonnaroo has a Solar Stage in Planet Roo to host music, dance, yoga, and environmental speakers. Within the campgrounds each pod has there own plaza placed strategically to continue community engagement throughout the grounds.
Everyone enters Bonnaroo through the Arch. Every year the arch gets a makeover and is kept secret until it is revealed to welcome bonnaroovians day 1 of the Festival. Friday is a very special day filling everyone on the farm up with good energy. As everyone enters Center Roo high fives are passed around. The Mushroom Water Fountain is centrally located by the vendor market with the stages grouped around the hub. The farm is a large landscape that can make you feel lost at times but the Ferris wheel is always in sight to guide the attendees to the exit. Kalliope stage is a smaller stage that lights the night until sunrise. Snake and Jakes Christmas Barn is centrally located and brings the festive holiday spirit in the middle of summer. Every night is a special curated event, like the robe party, where only attendees wearing robes can be admitted, dress robes, bath robes, or anything you can wear that drapes. Bonnaroo curates events to bring every attendees creativity out and offers bonnaroovians opportunities to curate their own events to bring the Roo Crew together.
2.1 BONNAROO CAMPING

CAMP PLAZA MAP

MORNING YOGA IN THE CAMP PLAZA

SANCTUARY OF SELF-LOVE IN CAMP PLAZA 2

THE CHRISTMAS BARN

HIGH FIVE FRIDAY

THE GARAGE PLAZA
2.2 ELECTRIC FOREST | ROTHBURY, MICHIGAN

Ticket Price: $374-$8,000
Festival Date: Late June
Camping Space: 360 SQ-FT
Attendance: 45,000 People
Stage: 14,670 SQ-FT
Stage | Audience Ratio: 1:55

ELECTRIC FOREST | 2009

ELECTRIC FOREST | 2018
2.2 Program & Spatial Analysis
2.2 Program & Spatial Analysis
2.2 ELECTRIC FOREST | ROTHBURY, MICHIGAN

Electric Forest is an immersive interactive experience like no other. Performers walk the grounds interacting with the attendees. Every attendee becomes part of the performance by performing as the main characters, themselves. There are 13 stages, Tripolar, The Ranch Arena, Sherwood Forest, The Chapel, The Silent Disco, Reincarnation Village, The Grand Antique | Trading Post, The Observatory, The Honey Com, Sherwood Court, Jubilee, The Hangar and The Carousel Club. The Hanger is a building featuring businesses free of charge themed as a “time machine” stepping you back in time with Speakeasy Bars and mechanics at the body shop. By exploring the Hanger and asking the right questions you are able to unlock certain codes that reveal hidden gems within the forest. The forest is programed for people to have moments to sit and rest, moments to explore, and moments to interact in the forest and meet new people. The term #ForestFam radiates an accepting, loving environment of pure joy to every attendee. Everyone is there to unplug from society to fully experience the moment and get lost in the forest.
2.2 ELECTRIC FOREST | ROTHBURY, MICHIGAN

Every corner of the forest awaits a new discovery. The Forest is programmed with a collection of different art installations. Some installations are interactive and some are for observation. Live artists have a space in the forest to paint murals on surfaces built or their own canvas. Carousel Club is a hidden gem in the Hangar. Surprise sets at any time of the day happen at the Carousel Club and the only way to know about the sets is through the word of the forest. Their is no cellphone reception but the Forest Fam is receptive to each other and spreads information by word of mouth.
2.2 Electric Forest Camping

FRIENDS THAT CAMP TOGETHER

Path to Festival Grounds
Fire Lane

CAMPING ALONE

Path to Festival Grounds
Fire Lane

SCALE: 1' = 1/32"

Tents surround canopy to create a community space. Tapestries create a sense of privacy and provides shade.
2.3 LOST LANDS | LEGEND VALLEY, OHIO

Lost Lands is a 3 day music festival curated by EDM Producer Excision. The festival is filled with 3 epic days of bass. Legend Valley is land of the prehistoric dinosaurs. Life-size dinos are scattered across the festival grounds to create an immersive experience for this caveman journey. The festival has 2 main-stages, The Paradox and Wompy Woods that play music all day and late till the evening, ending with Jurassic Park on the gigantic LED screens every night. If you still want some more bass, you can adventure to the sound-camps in the center of the campgrounds for music until sunrise.
2.3 LOST LANDS | LEGEND VALLEY, OHIO

Lost Lands brightens the night with lights and fire radiating throughout the grounds. Wompy Woods is a 5-story tall stage featuring volcanoes and life-size dinosaurs. The Wompy Woods and The Paradox Stage are the 2 main-stages powered with 1,000,000 watts of bass. New gathering spaces, like the Asteroid Bar, are programmed at Lost Lands. The Asteroid Bar is a Geodesic Dome with fire roaring in the sky and performers dancing and twirling with fire.
2.3 LOST LANDS | LEGEND VALLEY, OHIO

Ticket Price: $225-$2,000
Festival Date: Late September
Camping Space: 350 SQ-FT
Attendance: 35,000 People
Stage: 40,000 SQ-FT (200FT high)
Stage | Audience Ratio: 1:1

Camping Grounds
SCALE: 1’ = 1/1000”

Festival Grounds
SCALE: 1’ = 1/500”
2.3 LOST LANDS | LEGEND VALLEY, OHIO

Lighting & Acoustics

Lost Lands Wompy Woods Stage integrated vertical light pillars along the side of the audience. At the top of the pillars is PK Sound System equipped with 3D Wavefront control that can adjust the directivity of the speaker’s array. The lighting pillars and acoustics are integrated into one structure for a visual and auditory experience. The pillars are strategically placed for the best acoustics and make an excellent landmark for friends to find each other in the massive crowd. The LED screens are rigged on a concaved surface to create the illusion of a more 3 dimensional display of the visuals.
2.3 LOST LANDS | LEGEND VALLEY, OHIO

PK Sound System

Engineering has advanced to increase the acoustic coverage of vertical rigging with 3D Wavefront Control. With a few clicks of a mouse the system can be reconfigured rather than manually adjusting the direction of the sound fields. Adjustments can be made remotely, in real time, to control the horizontal and vertical directivity of the array by changing how wide, narrow, short or long a sound field, or controlling the sound pressure level (SPL). PK Sound is the first technology to control sound directivity in all three directions remotely. The horizontal source is defined with coordinates to the left and right side of the X-Z plane, with or symmetrically or asymmetrically. The vertical source is assigned coordinates to determine the degree with 1° accuracy of array curve on the Y-Z plane. Sound pressure levels can be controlled for better consistency across an audience and reduce SPL in unwanted areas.
2.3 LOST LANDS | LEGEND VALLEY, OHIO

PK Sound System

“The sub-woofer deployment at the main stage relied on (12) PK GRAVITY 30 running 15,000 watts each in addition to (52) CX800 2000w Dual 18” Extended LF Sub-woofers to create a 200’ sub-wall. The second stage also featured stacked dual 18” sub-woofers using (16) PK Gravity 218 and (52) CX800...The capacity crowds and towering stage designs stretching over 200 ft. high and 400 ft. wide provided an ideal opportunity for PK’s largest ever load-out to meet high expectations of listener and producer alike with immersive sound embedded in an equally large stage production. Trinity array speaker customization eliminated the need for extra fill placement. The use of both Gravity 30 and Gravity 218 Sub-woofers allowed stacked placement with more effective output compared to traditional dual 18” sub-woofers, leading to an equally space-efficient footprint that allowed for the largest amount of audio on just two stages in history.

Lost Lands also featured a secondary PK load-out for all 6 “Sound Camps” inside the festival for more intimate late-night performances. These stages used a total of (48) PK VX10 as low-hung arrays paired with (36) CX800 subs. Making use of the Trinity’s proprietary features was integral to the system engineer’s efforts to build a custom soundscape for the event.

Installation of Sound System

1. Install rigging arm
2. Connect a module to the rigging arm
3. Lift modules from the cart
4. Lower and connect the next four modules
5. Repeat until desired modules are added

The installation process of the sound-system is faster and safer. The rigging system is designed to require no manual labor with self-aligning assembly. Pins are inserted by the weight of itself and the modules are lifted. The process can be repeated until the amount of modules are achieved for the desired sound quality.
2.3 LOST LANDS | LEGEND VALLEY, OHIO

FRIENDS THAT CAMP TOGETHER

ARIAL CAMPING VIEW

CAMPING ALONE

GLAMPING SET UP

COMMUNITY CAMPING SHRINE

Path to Festival Grounds | Fire Lane

SCALE: 1’ = 1/32”
2.4 OKEECHOBEE MUSIC FESTIVAL | OKEECHOBEE, FLORIDA
2.4 OKEECHOBEE MUSIC FESTIVAL | OKEECHOBEE, FLORIDA

Okeechobee Music Festival is a 4 day festival taking okeechoebeings on a journey through The Portal in Okeechobee, Florida. The festival grounds, called The Grove is home to Be, Here, and Now stages, motivating people to be present in the moment. Okeechobee designs special places with installations that create beautiful moments scattered throughout the grounds. Okeechobee starts dissolving the boundaries of festival grounds and camping grounds by programming stages near the campground market place. Aquachobee is on the water and centered in the campgrounds by the entrance to The Grove. Aquachobee feels open and free with morning yoga on the beach. Day time sets start at noon until the sun sets across the water initiating the start to the evening activities.
Okeechobee Music Festival is radiating all day and night with activities for Okeechobeeings to be a part of. Installations activate the senses to create an immersive experience. The Tea Lounge is an Alison Wonderland Lost World theme waiting to be explored. Lasers light the night sky and trees with colors. Aquachobee hosts majority of the morning activities, while The Grove and Incendia stage prepares for the evenings. Headliners from different genres perform until late in the evening at The Grove on the main stages, Be and Now Stage. The performances continue at Here Stage after The Grove closes for a few more hours until Incendia stage ignites the night. Incendia stage hosts surprise dubstep sets until the sunrise every night. Next to Aquachobee, Jungle 51 dances the night away with house music. Okeechobee is home to an genre of music and home to any being.
Here stage made it’s debut 2020 outside of the festival grounds, The Grove. Be Stage and Now Stage are on opposite sides of The Grove, allowing for better acoustics than the years prior. Stages are separated by larger distances and surrounded by trees for acoustic buffers. The Here Stage is under a large tent concaved over the audience. The tensile fabric is segmented with triangulated pieces of fabric allowing wind to breeze through the gaps of the tent. Air Flow is essential to prevent the wind from lifting up the enclosure. The fabric blows with the wind and creates shade during the day. During the night, lights suspended from the beams are projected onto the fabric of the enclosure. Patterns are projected to create a more immersive visual experience other than the stage alone.
2.4 OKEECHOBEE MUSIC FESTIVAL | OKEECHOBEE, FLORIDA

Here Stage- Okeechobee Music Festival

Light Projection Technology onto fabric
2.4 OKEECHOBEE MUSIC FESTIVAL | OKEECHOBEE, FLORIDA

The Grove 2018 was home to Be, Here, and Now stage. Music from other stages reverberated towards the back of the audience.

The Grove 2020 was home to Be and Now stage. Here stage was moved outside of the Grove resulting in better acoustics.

2018 Camping Grounds | Festival Grounds

SCALE: 1' = 1/1000''

THE GROVE

SCALE: 1' = 1/500''
By selecting a site that offers natural geographic scenery, we can design an immersive musical experience with the natural landscape. The canyons in Utah feature natural phenomenons of light and sound. The alcoves in the canyons have a natural acoustic quality of echo and reverberation. A unique experience can be designed for the attendees to explore the space by programming the alcoves for collective making through music.
SITE ANALYSIS
3.1 SITE SELECTION

SITE QUALITIES

- Transportation
- Geographic Scenery
- Light and Acoustic Qualities
3.1 SITE SELECTION
EXISTING MUSIC FESTIVALS IN AMERICA

GEOGRAPHIC SCENERY

ACOUSTICS
An opportunity to design a festival in a natural landscape resides in the canyons of Utah. The canyons are sacred spaces with natural phenomenas of lighting and acoustics.

Why Canyons?

REVERBERATION
ECHO ECHO ECHO

LIGHT
3.1 SITE SELECTION

The Wave

Buckskin Gulch Via Wire Pass

- HWY 89
- ROADS
- THE BUCKSKIN GULCH - The longest slot canyon in the world extending 15 miles.
3.1 THE BUCKSKIN GULCH
3.2 SITE ANALYSIS

CNC SITE PLAN

- The Wave
- Wire Pass

- HWY 89
- ROADS
- THE BUCKSKIN GULCH - The longest slot canyon in the world extending 15 miles.
3.2 SITE ANALYSIS

The Wave
The Wave is a sandstone rock formation located north of the Utah border in Arizona. The Wave is a trail that leads to Buckskin Gulch, the largest known slot canyon in the world.

Buckskin Gulch Via Wire Pass
The Buckskin Gulch Via Wire Pass is a trail-head that leads to The Wave and to Buckskin Gulch. The Wire Pass is a slot canyon with opportunity to program exploratory zones to experience.
3.3 THE WAVE
3.4 BUCKSKIN GULCH VIA WIRE PASS
3.4 BUCKSKIN GULCH VIA WIRE PASS
3D PRINTED SLOT CANYON MODEL
A Form Study was developed with 3D Printing to understand the curvature of the slot canyon. Sound waves are projected and reverberate, echo, or dissipate throughout the space. In a canyon, the natural curves of the rock formation concave and convex to alter the degree of the sound sources projection. The Right canyon wall is very textured.

Left Canyon Wall
Right Canyon Wall
Perspective of 3D Printed Slot Canyon

A moment of release at the slot canyon.
DESIGN PROCESS
4.1 DESIGN APPROACH

Initial Shape

Rule

Derivation

→

→

→
4.1 DESIGN APPROACH

Circles are overlapped and points of intersection are generated. The points are connected with lines to create different geometric iterations.
4.1 DESIGN APPROACH
4.1 DESIGN APPROACH

MESH MODEL 1

MESH MODEL 2

MESH MODEL 3
ZONING

- PRODUCTION LANE
- MAIN STREET
- CAMPING
- FESTIVAL GROUND
- VENDOR MARKET

The map shows a layout with areas marked for different uses. The PRODUCTION LANE is shown in dark blue, the MAIN STREET in gray, the CAMPING areas in light orange, the FESTIVAL GROUND in teal, and the VENDOR MARKET in red. The map also includes a scale indicating 1 mile.
4.2 VENDORS MARKET DESIGN APPROACH

Tensile Enclosure
Circles are overlapped and generate points of intersection. The structural poles are extruded from the intersecting points and the tensile membrane is stretched out from the central axis.

Food, Clothing and Craft Vendors
Lines are generated from the geometry by connecting the intersecting points. Platforms are elevated along the lines with food and clothing vendors programmed underneath. Voids are introduced along the main street for circulation.

Mesh
Meshes are suspended for lounging and allows attendees to explore and gain a new perspective. The triangulated geometry of the mesh is extracted from the voids between the platforms.
4.2 VENDORS MARKET PROGRAM

VENDOR MARKET PROGRAM ANALYSIS
The membrane is stretched across the poles.

The meshes are suspended from the poles for elevated seating.

The structural poles are extruded from the intersecting points.

The vendors are placed along the generated lines.
4.2 VENDORS MARKET SECTION

Interior Render of Clothing Vendors
4.2 VENDORS MARKET ELEVATIONS
4.3 PERFORMANCE ENCLOSURE DESIGN APPROACH

Initial Shape

Rule

Derivation
4.3 PERFORMANCE ENCLOSURE DESIGN APPROACH

Geometries are overlapped and extracted out.

Compression curves the fabric of the enclosure

A module is extracted from the layering.

Posts are extruded from the points of the fabric

The module is multiplied by 3 to increase the span of the enclosure and connect to the extruded posts.
4.3 PERFORMANCE ENCLOSURE STRUCTURE

Lintel and bracing replaces the center poles for a better view of the stage throughout the length of the enclosure.

Cactus and local vegetation camouflage the tension cables anchored to the ground and prevent people from tripping.
The membrane is stretched across the poles.

The structural poles are extruded from the intersecting points.
4.3 PERFORMANCE ENCLOSURE ELEVATIONS

Lintel and bracing replaces the center poles for a better view of the stage.
During the day the enclosure creates shade from the hot sun. Throughout the day the sun beams through the voids of the fabric and creates different spotlights and shadows in the audience.

Cactus and local vegetation camouflage the tension cables anchored to the ground and prevent people from tripping.
4.3 PERFORMANCE ENCLOSURE SECTION

Lighting technology is suspended from the poles horizontally down the side of the enclosure. The tallest beams are wrapped with LED screens and are used to rig speakers for an immersive visual and auditory experience. The stage is elevated with LED screens at the base. Lights are projected onto the fabric of the enclosure and the surrounding canyons.
4.4 CAMPING MODULE DESIGN APPROACH

The concept for the camping module is to integrate a space for the community, sleeping, parking, and lounging. Destroyed tents, broken canopies and popped air mattresses are left from attendees across camping grounds at the end of every festival. If a modular infrastructure is designed, it will result in less waste and be utilized every year. If the module was elevated than the underneath space could be optimized as a parking lane. If each module shared a communal space then it increases the chance of encounters with neighbors.
The camping module is designed in proportion to shipping crates for easy transportation on and off site.

The camping module is designed to be easily assembled with poles and tensile fabric.

Exploded Axonometric

Scale: 1" = 1/16"

Section

Parked Cars with personal sleeping pod above

Community Space with lounging mesh above

Emergency Fire Lane

Parked Cars with personal sleeping pod above

Scale: 1" = 1/4"
Cluster of Camping Modules

The cluster of camping modules come together to create a grid network of streets or lanes. The streets act as arteries to circulate the festival attendees to the heart of the festival grounds, the vendor market. The camping modules create an elevated sleeping pod as a private zone for each attendee to escape and rest. Public zones are centrally located with a lounging mesh. The space underneath the lounging mesh is used for the community to gather. Attendees can hang tapestries if they desire but the tensile enclosure provides the shading and fragments of light beam through the segmented fabric pieces.
4.4 DESIGN APPROACH FOR CLUSTER OF CAMPING MODULES

144 cars (1 car per spot), 288 possible tents (2 tents, or 1 tent and 1 canopy) 86,400 SQ FT

115 cars, 36 modules, 216 beds sleep 216–432 people) 82,800 SQ FT

160 cars | 160 tents (sleeps 160–640 people) 73,500 SQ FT

126 cars | 46 modules | 276 beds (sleeps 276–552 people) 83,300 SQ FT

A typical festival camping configuration is a precedent for finding the camping footprint with the modular living pods becoming a network. The grid layout creates vertical and horizontal planes for direction. Each network of pods would have its own “street” or “plot” or “neighborhood.” The underneath space of the camping module is optimized for circulation and community engagement. Cars are aligned under the sleeping pods and underneath the lounging mesh is left void for neighbors to gather and serves as an emergency fire lane.
Camping Module Tensile Membrane

The cluster of the camping modules can have a variation of patterns for the tensile membrane. The fabric can use the posts to elevate the fabric and connect the segmented fabric pieces with cables. The tensile fabric can also use the posts as the anchors for one continuous tensile membrane.
4.4 CAMPING MODULE PHYSICAL MODEL
4.4 CAMPING MODULE PHYSICAL MODEL
FINAL REFLECTION

My respect for festival curators has grown throughout this thesis. There is no way possible one person could design and plan for every inch of a festival. Designing a festival requires a collective of artists, engineers, architects, and musicians to design an extraordinary experience. Team work makes the dream work, it is not a one man show.

My studies show that festivals are programmed to engage the community with art and music around a central theme. The theme is portrayed with the use of art installations, structures and stage design. This can be simplified by stripping away these elements and implementing architecture. There is an opportunity for architects to design an infrastructure that allows festival attendees to engage with art and music for a sensory experience.

Through my design explorations a systematic approach was used based on the program and original conditions of the festival spaces. Camping Modules were elevated to allow parking underneath, resulting in less waste and space. The Vendor Market’s infrastructure was designed to create an elevated platform for mesh to suspend for attendees to lounge in. The market also serves as a beacon for the campers. The market is centrally located and at the entrance of the festival grounds. My explorations of the stage enclosure demonstrates a method for containing acoustics in the desired audience rather than bleeding into another stage’s audience zone. My methodology to generate aesthetically appealing geometries was through overlapping circles at different ratios. Design continuity is prevalent with the use materials, regards to this thesis the use of pole and tensile fabric is used to create the temporary structures.

I hope this thesis brings inspiration and acts as a tool for people who plan to currate their own festival. Thank you.
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