Composing Space A Spatial & Sonic Experience

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Project Brief

Both sound and space can evoke feelings by presenting different qualities (sharpness, height, density...); a series of qualities in a particular sequence makes an "experience." Even though musical and architectural experiences tackle different senses, musicians compose sound, and architects compose space. Music and space, metaphorically, are "designed" in similar ways. In this project, I intend to design architecture as how a composer would compose a piece of music.

As how architects find inspirations from paintings/arts, musical thinking may help designers to compose space beyond vision, leading to more complex and richer spatial experiences.

This project, as a hinge of the two disciplines, consists of 2 parts: *from music to space*, and *from space to music*.

Part I is the process of designing sonic and rhythmic experience.

Part II explains how the translation creates music from the spatial experience. Visual information can be vocalized as a choral composition.

Program: Sound installations **Location:** Antelope Island State Park, Utah



I. Architecture

Scientifically speaking, the spatial nature of music is inherent. Studies on cognitive science show that human perceive music visually and spatially. *The theory of dynamic perception* indicates that three levels of visualization on understanding music can be classified:

- frequencies and pixels = static information
- notes = visual objects
- melodies = visual trajectories

This relation encourages a thourough consideration on arts and mediums; music and architecture, or sound and space, can relate to each other and initiate interpretations and creations.

What can we get if we design with the guide of sound?

Cross-medium Experience



Precedents

possibilities of bridging musical & spatial qualities

Muted Music Iannis Xenakis, La Tourette

lannis Xenakis was a music theorist, architect, and engineer who was into bringing mathematics, space, and music together. His "musical facade" design is an example of using musical & architectural qualities to form experiences of rhythm, incorporating light & shadow.



The movement of "walking along the facade" is an assumption embedded in this practice; the time in music is presented by people's action.





Space Design

Peter Zumthor, Swiss Sound Pavilion

The Swiss Sound Pavilion is a performance space that can accommodate different acoustic needs. Zumthor considered the material and quality of each section of the pavilion.

The permeable walls make the atmosphere change with time of the year, weather, and sound.



During the design process, a

linear experience, or a timeline,

helped arrange the plan. Space,

time, instruments are organized

Using the same visual language,

walls create corridors with open

at the same time. (left page)

a "knitting pattern," wooden

Different scales of spaces

hear various of sound effects.

spaces.





Visual Documentation

Bernard Tschumi & Sergei Eisenstein

Film director Eisenstein used visual graphics to map picture frames, music, and movement for the film Alexander Nevaski. Tschumi, when designing, used a similar visual language to document the experience walking through the space. Time is represented horizontally.



NOTATION for the film ALEXANDRE NEVASKI, 1938, Sergei Eisenstein



Homage to Eisenstein, Joyce's Garden, 1976-77, Bernard Tschumi

"There is no architecture without action, without movement." Bernard Tschumi



Translation



Walking by different architectural elements insinuate different musical feelings. This translation is the basic assumption of this project: using these as the vocabulary to compose architecture and create music.

Project Proposal *design method*



time-space

framework



texture



pitch, sustain, movement...

Creative process of composing: similar to architectural design

1. Set up the language: the translative relationship between spatial and musical qualities. Set up architectural elements and their corresponding musical expression. In this process, learn from the composer and think about space as how a composer would compose a piece of music.

2. Compose by layer: add layers of elements to the spatial design, such as size, texture, movement... Create music and architecture in parallel, so that the space can be read as sheet music.

3. Architectural score: "sheet music" for the musical and spatial experience: light, materiality, changes of scale...

This experience can be documented in creative ways: using the combination of maps (present music architecturally) and musical notation (present architecture musically) to document the visual and auditory experience as a whole. Xi Jin



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The Sound of History

past development

Antelope Island has a long history of being untamed and primitive.

The history of the island is a merging of human activity and landscape/resources, being destroyed and reconstructed, natural and man-made.





introduced to the island.







Site Plan *design experience in time*

The musical path connects two existing hiking trails: *Buffalo Point* (left) and *Lakeside* (right). Installations are spreaded out on a 10- to 12-minute walk. Each chapter of the path has a duration and characteristic. Bells with specific pitches are placed along the way as **anchors**. Visitors can play with them and hear the sonic effect of the space.



Installations architectural documents





Megaphone & Bridge

Two funnel-shaped atriums have one bell in each. It is to provide an interactive sound experience for people on different floors.

Following the Megaphone, the path extends out and becomes a metal mesh bridge. Walking on and under form a duet.







Rain Room

Metal roof and exterior panels amplifies the sound of rain. Low window requires visitors to sit down and listen to the rain and look out of the window. The rain room function as a resting point for meditation or sound bath.









Bird Garden

Based on the walking speed 200ft/min, the radius of the installation is 32ft, which makes walking around the circle take about 1 minute. The wall with various sizes of openings creates rhythmic experience.

Bird species like Sage Thrasher are attracted by local shrubs. Wind and birds brings in natural sound.







Megaphone



Rainroom



Detail Design

Details of the installation engage sound.

Score

Below is an example of a full sheet of *Score*. On top of architectural plans and sections, vertically, layers of diagramming translates distance to time, given a constant walking speed.

As the sections are unfolded, using the same graphic scale, distance can be marked in steps, and steps indicate time.





II. Music

To understand and develop the creative process, I collaborated with a composer to make a **musical composition** out of the **walking experience** I created. The piece of music is a simulation of a fictional visit of 5 people along the path. **Architecture is read as music scores**. They walk, stop, play, listen to the birds, hit on columns, ring the bells...this experience is fully coded and documented (left page).

Additional rules are applied to vocalize materials using simple vowels. The music we intend to create is the merge of natural sounds (from wind, birds, plants) and human interaction with materials (singing and percussion); the combination of them speaks directly to the feature and history of the land, primitive and raw.





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Precedents cultural background

Sonic Poetry

Hugo Ball

Hugo Ball was a co-founder of the DADA Movement in early 1920s. He was a German poet who started the concept of "Sonic Poetry." He invented languages that have no particular meanings, only for the sake of sound.

He extended the tradition of poetry and merged visual and sonic experience.

Wolken by Hugo Ball: https://vimeo.com/544739050

KARAWANE jolifanto bambla ô falli bambla grossiga m'pfa habla horem égiga goramen higo bloiko russula huju hollaka hollala anlogo bung blago bung blago bung bosso fataka schampa wulla wussa ólobo hej tatta gôrem eschige zunbada wulubu ssubudu uluw ssubudu tumba ba- umf kusagauma ba - umf

Visual script of sonic poetry KARAWANE

Medieval Motet

musical composition inspired by architecture

Nuper rosarum flores is a Motet composed by Guillaume Dufay in 1436 for the completion of the dome of Florence Cathedral designed by Brunelleschi. Musicologies discovered the relationship between the motet and the dome design: the double-layer structure and the unconventional use of two tenors, its musical structure and the proportion and dimension of the church...

Nuper rosarum flores by Dufay: https://www.youtube.com/ watch?v=P9yzTTwAj5U



Dome of the Florence Cathedral

Collaboration

timeline and collaborator





Emily McPherson is a graduate student in the School of Music, studying composing. She is graduating with a Master of Music degree in May.

Her work includes a wide variety of instrumentation across different styles including solo, large and small chamber ensembles, large ensembles, and electronics via fixed media and live electronics. Her work is primarily influenced by external media such as the visual arts, environment, poetry/written text, and a connection to physical space and time.

Emily and I met regularly throughout the semester to discuss how the translation between music and architecture could work and be read. After the design is completed, Emily and I recruited singers to record, reading off of the "architectural score."

Xi Jin

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Score Sample (in development)



experiment on graphic scores

'Simulation' is a piece of music that simulates a fictional visit of 5 people at the installation on the Antelope Island. In addition to the translation set up from different architectural elements, we set up vowels for materials:

ooh = wood ahh = concrete eee = steel

During the recording session, each of the singers was given:

instruction for reading the graphics a partial score of their paths visuals that shows where they "are"

Instruction:

1. Strike the opening bells to identify all the possible pitches available. These are the anchor points (small bells placed around the path).

2. Vocalize sounds when passing by specific materials or shapes:

a. Columns

i. sustain pitch from an anchor point for as long as it takes to pass the column. ii. stop vocalizing on the spaces in between the columns

b.Walls

i. sustain pitch on an anchor point for as long as it takes to walk along the wall. ii.stop vocalizing when passing doorways or windows

c.Openings

- i. all openings are areas to stop vocalizing
- ii. this includes: windows, doors, arches, open space between objects, etc.

d.Slope/Elevation

- i. rising slope: raise pitch in a gliss-like manner
- ii. downward slop: lower pitch in a gliss-like manner
- iii. rising steps: raise pitch on individual notes
- iv. downward steps: lower pitch on individual notes

3. Dynamics

- a. change dynamics based on the distance between yourself and the object (column + walls)b. the further the distance, the softer the sound
- 4. Material type/Vocalization technique
 - a. wood: "ooh" b.metal: "eee" c.steel: "ah<u>h"</u>



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