Space Emerged from Music

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Abstract

A studio project is conducted to design a walkthrough space from music pieces. In this project, the translation from non-visual artwork into visual forms is interrogated. Diagrams are used as the mediator in the translation process.

Introduction

"Design Translation" refers to the process of taking a piece of artwork, such as a painting, music, or a film, as a point of departure from which to begin designing architectural space. It has been a continuing experiment in architectural practice and education.

In order to understand the process of design translation, the first question that must be asked is: What gives form to space? In the case of translating a painting (visual modality) into spatial terms, one might take the shapes in the painting and transform them literally into spatial correlates. In the case of translating a narrative or feelings (non-visual modality) into spatial terms, one has to make decisions about how to reinterpret the non-visual constructs into spatial forms.

The translation from a piece of music to a spatial form lies in-between the above two categories. On one hand, the rhythm of music provides a temporal structure, a semi-visual component, for the spatial structure. On the other hand, the feelings rendered in music are non-visual components which need to be embedded in the space to be designed. How is rhythm constructed in space? How are feelings constructed in space? Does spatial rhythm automatically lead to certain feelings? This paper will approach these questions by experimenting with design translation projects in the author's beginning design studios.

The Brief

A studio project is conducted in the fall semester of 2006. The brief of the project is to design the progression of a walkthrough space from the progression of a piece of music. The objective is to identify the ways in which spatial components transfer or emerge in the process of translation.

The progression of music can be understood on two levels. On one level, it is registered in measurable factors, such as rhythm, timbre, texture, melody, and harmony. On the other level, it is registered in the feelings aroused in the audience. Feelings are very dense factors that can hardly be directly measured. However, feelings are common components of artworks across media, such as paintings by Wassily Kandinsky, films by Sergei Eisenstein, dance by Merce Cunningham, and poetry E. E. Cummings. Feelings can also be embedded in architectural space. The holocaust tower at the Jewish Museum in Berlin designed by Daniel Libeskind is just one great example. Therefore, in this current studio project feeling serves as a thread that ties the starting point (a piece of music) and the end point (a walkthrough space) together, although in a less direct way than those measurable factors do.

The Music

The studio project departs from three music pieces composed by Morgan Jenks. The music pieces focus on formal structures of music. In other words, the rhythms generated in these music pieces are precisely designed by the composer. Meanwhile, various sound qualities are also used in the compositions.

State_01

The first 40 seconds are a module or a core that the rest of the piece built around. The passage of the music progresses to the 20 second mark and reverses from there, so that it is symmetrical in that respect. For the rest of the composition, the composer dissects and layers the music in a painterly fashion. The piece is not about the strict counter points of tins and clicks. On the contrary, the counterpoint of sonic events on the micro level lies in an ambiguous area between chance and subjective detailing.

State_02 (for Agnes Martin)

State_02 is inspired by the grids of Agnes Martin. Ideally, the work should be presented as an endless stream of sound, looping continuously. The listener should come upon it much like a wall hung canvas, by entering the space that the sounds already occupy. State_02 is vertically symmetrical: two tones a half step apart (which is the smallest interval on the piano) play an irregular rhythm in the center of the frequency spectrum and are bound by veils of noise above and below.

State_03 (music for digital playback)

This piece has, at its core, a band of four tones (appearing at approximately the beginning of the work), the rhythms, stereo placement, and of which have been manipulated expressively. The intervallic structure of this band is symmetrical around the inner two pitches.

As the piece proceeds, duplicates of the tonal band are applied at higher and lower pitch levels, creating a more immersive sound. The sound that appears at about 1’10” into the piece is actually comprised of the tonal band with various compressions and distortions applied to it.

Process

The project is choreographed in a process of three major phases: 1) diagramming (Figure 1), 2) drawing interpretation, and 3) space formulation. The goal of the process is to draw formal components from music and transform them into spatial components.

In the diagramming phase, depending on how familiar the student is with the technicalities of music, he or she may draw shapes either from precise aspects of rhythm or from feelings that they attain from the music. Accordingly, students are asked to use either manual drawings to record the measurements of music or freehand sketches to record the impression of the music. The former way of diagramming is objective and can be tested against the associated music. The latter way of diagramming is dependant on individual readings so that it cannot be strictly tested. It is dense and vague compared to the former.

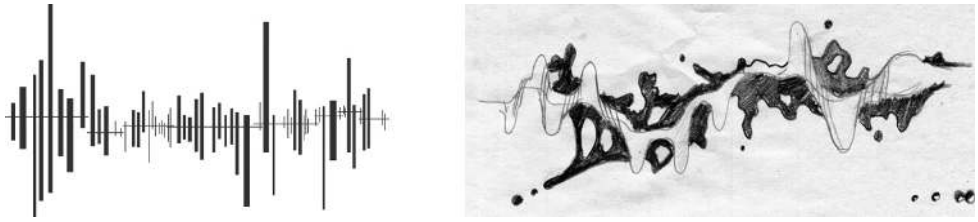

Figure 1. Analytical and expressive diagrams

However, some fundamental attributes and relationships of the sketches still make sense to the collective eye in relation to the original piece of music. Both kinds of diagrams become the premise for the design project.

Drawing interpretation follows the phase of diagramming. The purpose of this phase is to use drawings as indicators of three-dimensional space. Students are encouraged to find strategies to manipulate drawings and "read" space from them. One requirement in this phase is that the manipulation strategies should be coherent with the structure of the original piece of music. This requires students to explore two links. One is the link between the spatial indications and drawing conventions. The other is the link between compositional operations (such as rotation, overlay, and shift) as musical operations and as spatial operations.

The final phase is space formulation. In this phase, space is not an abstract object that is looked at from far away but an environment that embodies the viewer's movement. Therefore, the space has a scale as well as gravity. In addition, more physical conditions come into play, such as light and texture. However, a realistic program is not introduced. The space remains in its primitive condition for the viewer to walk through. The rhythms and feelings embedded in the space will be tied back to the original piece of music.

Exploration Diaries

Although the composer has clear intentions in constructing the formal structure of the music students do not interrogate the music as rigorously as they could. One has to admit the missed opportunity at this point. For the majority of students, the weave graphs appear to be a convenient aid for diagrams. Students either intuitively use loose sketches to document obvious "events" in the music (such as beats versus silence, strong notes versus weak notes, and definite sound versus floating sound) or simply use software to catch the accurate weaves of the soundtrack. Based on the limited diagrams, what becomes crucial for the design project is how students interpret the weave graphs in drawings as well as extend these interpretations into the design of spatial experience.

One student, Ann Frankovich, chooses to stay within the vocabulary of weave (Figure 2). What she does is to explore the scale of weave forms as well as the three-dimensional potentials of weave forms. By determining the size of the originally abstract weave forms a scale is set in relation to a human body and its movement. Architectural meaning is then

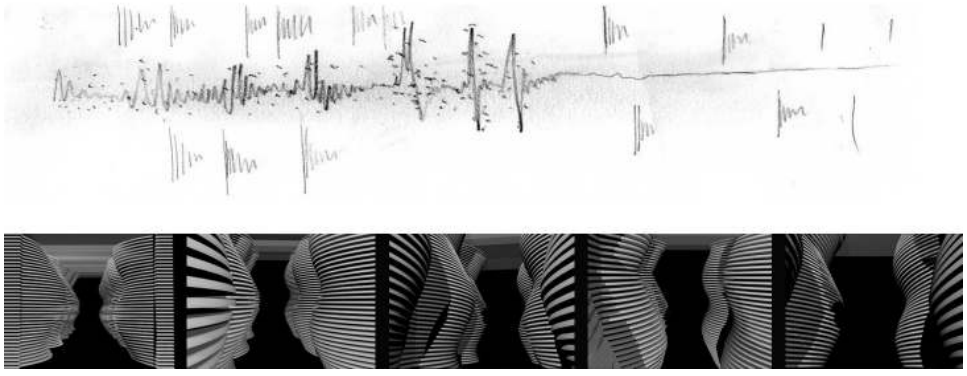

Figure 2. Design process 1

injected to the abstract forms. The student becomes conscious of the viewer's feelings aroused from his or her body movement among these curved structures. In turn, she consciously adjusts the form of the wavy space in order to challenge the viewer's body and hence stimulates the viewer's feelings in a more controlled way. The feelings are remotely linked back to the feelings that she experiences while listening to the original music.

Another student, David Pearce, interprets the weave graph as solids and voids on a plane (Figure 3). A surface with rhythmic openings is generated through etching the voids. He then zooms in the weave graph and uses the curvature to create another surface. By integrating these two surfaces vertically parallel to each other a narrow gap is formed in between. A walkthrough space is designated along the "double wall" that presents the progression light conditions and viewing conditions as the viewer walks by. The sonic rhythm of music is transformed into the spatial rhythm of light and of viewing.

David Seifert produces a set of expressive drawings in the phase of diagramming. The richness of the drawings entitles them to stand as independent pieces without the need of referring to the music. In the same manner, his final design of a mass complex, which interweaves with the voids, can also stand on its own. However, the transformation process becomes intriguing. How do the brush strokes of these drawings derive from the music? How do these drawings become the final space for the viewers to walk through? The student's writing reveals his thinking process.

After listening to the sounds from the first track, the lines that I found myself developing were simple straight marks. From studying the pencil drawing and the bamboo and India ink drawing, I realized that most of the aggressive

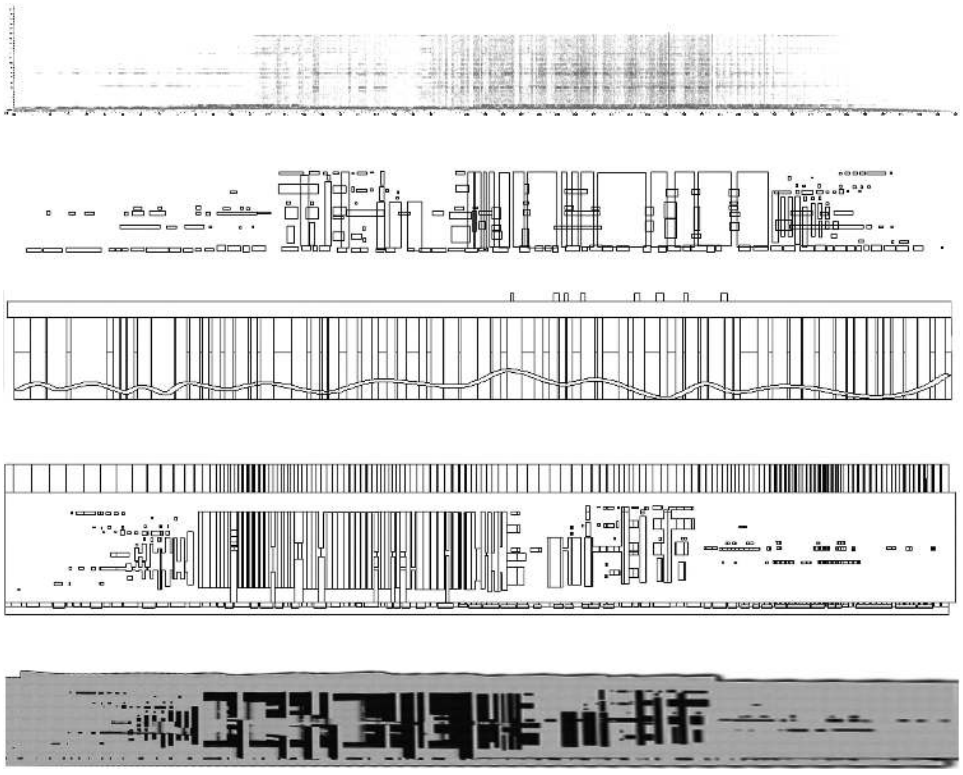

Figure 3. Design process 2

marks were occurring during periods of short, loud beeps within the track. Therefore the time sequence chart that grew from the previous drawings included simple lines that were sharper and longer at certain louder periods in the song.

The second piece was not quite as choppy as the first, and the sounds seemed to be floating throughout the track without any apparent direction. The preliminary drawings both ended up taking on the form of circular squiggle lines that began at one side of the page and meandered to the opposite side. These types of marks mimic the sounds in the second track because both drift along without purpose.

Clearly the most intricate song, track three consisted of sounds that were loud, soft, jarring and soothing. The line development went from a number of short, choppy lines into a flowing group of straight lines combined with curved lines. However, the final product in the pencil drawing, India ink rendering and the time sequence always seemed to be dominated by clusters of criss-crossing straight lines. A flow does occur from cluster to cluster as the song continues to repeat and change throughout its time span (Figure 4).

It is the key moment when the student establishes the link between the quality of visual shapes and the quality of sound in music. The links are made almost by intuition as the student describes how "I found myself

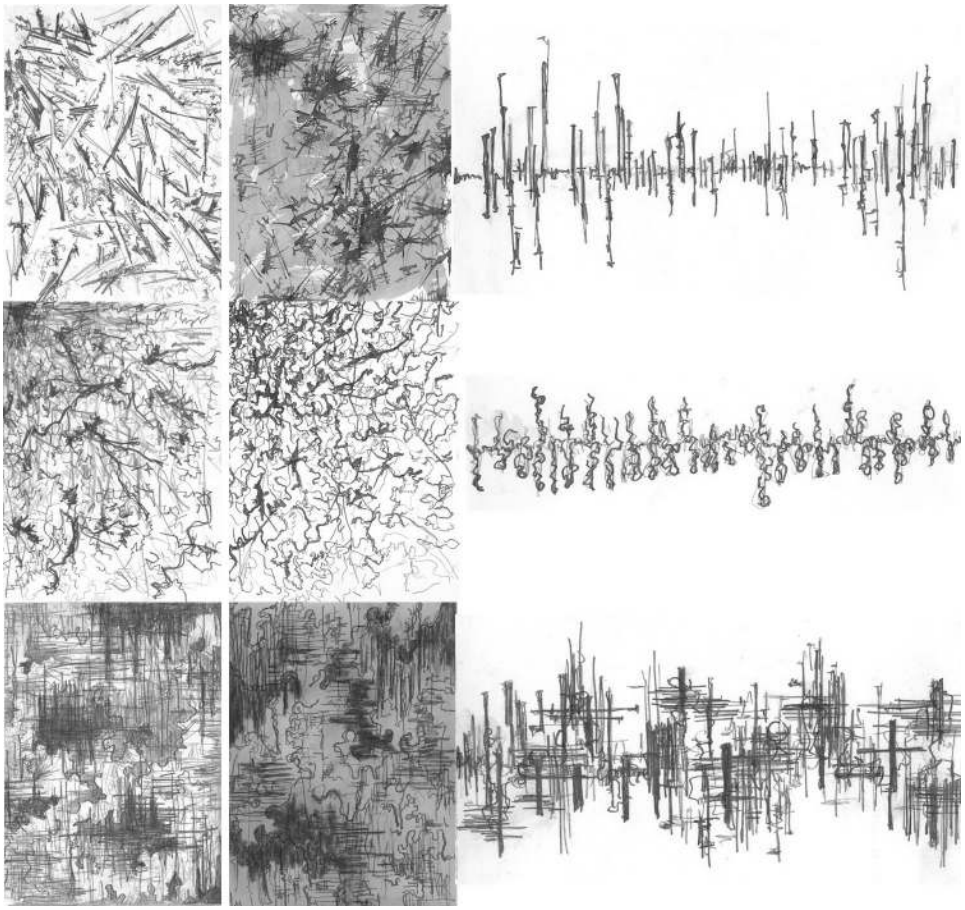

Figure 4. Seifert's diagrams

developing" straight lines. Interestingly, he uses aggressiveness to associate lines with sharp turns and fast speed with short and loud beeps in the music. When he listens to a floating sound the shapes become circular squiggle lines that drift on the surface of the paper. In addition, the lengths of lines are used to indicate the loudness of sound. Although not consciously realized, the line weights as well as the pressure applied to each stroke also reflect the loudness of the sound.

The drawings are then interpreted as "plans" and "sections" of a mass/space complex. In some cases, the student adopts the compositions from the drawings while in others he focuses more on the indicated movements of the shapes. In addition, the drawing qualities embedded in the drawing media, such as India ink and charcoal, dictate the spatial quality of the mass/space complex. Three-dimensional variations are then derived from the drawings. Once texture is determined and eye-level are set, the space becomes real in the virtual space. The space start to unfold itself in reaction to the viewer's embodied experience (Figure 5).

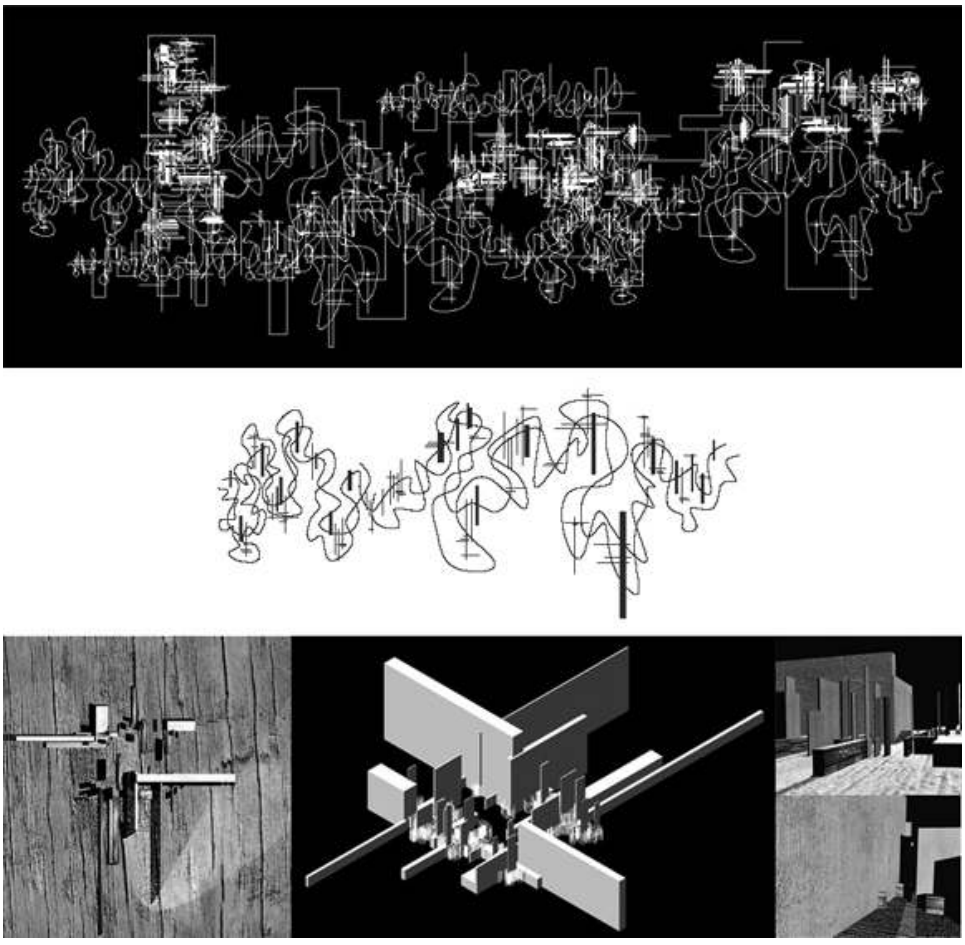

Figure 5. Design process 3 (space)

Theoretical Links Behind

The studio project interrogates several relationships, such as the relationship between sonic quality and visual quality, between temporal structure and spatial structure, as

well as between meaning embedded in abstract forms and meaning embedded in embodied experience. The core of the studio project is the creation of spatial meaning.

Architectural space is an abstract entity, so it does not mean by way of literal referencing to other objects. Instead, architectural space means through referencing to properties. As composers operate musical notes and instruments, architects operate space. In other words, architects infer thoughts and feeling by working on what can be seen or otherwise perceived and experienced.

In the studio project, students explore two ways of creating spatial meaning. One is exemplification. The other is expression. By exemplification we mean space referring to properties that are literally possessed. For example, the rhythm in music is adapted and embedded as the rhythm of opening on a piece of wall. By expression we mean space referring to properties that are metaphorically possessed. For example, the feeling of floating in the music is transformed into the space with undefined boundaries.

In both cases, the idea of form seems to be an objective link among exemplification, expression and physical properties. According to Langer, the meaning of "form" is beyond its common connotation of shape (Langer 1953, 23). Form is more than geometric; it is a set of logical relationships, like thoughts, which may thus share a common form with physical construction. That is, thoughts and construction may exemplify the same logic. Thus, the form of thoughts and the form of construction are related because they are analogous. This explains why our thoughts and feelings are not normally understood as shapes, but we experience certain feelings when we see. This is best demonstrated in the third student's using straight lines and sharp turns to express aggressiveness in music.

In the studio project, the diagram serves as a recording device as well as a generative device of forms. The diagram is the mediator for the transition from non-visual medium to visual medium. The phase of drawings manipulation is just a more precise version of diagrams. If we push the idea of the diagram further, the space formulated at the end can be understood as a spatial diagram of the music. Therefore, the fundamental meaning of a diagram is one thing that can catch the essence of the other.

Architectural space is occupied by bodies so that its meaning is eventually contingent upon what is inferred and experienced through such occupancy. That is why the phase of formulation of space is critical in the design process. Only when space is understood in relation to the viewer's body and its movement can it become meaningful at the architectural level.

Through embodied experiences, metaphorical possession is established and expression is built into literal properties.

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Reference:

Goodman, Nelson, Languages of Art, Indianapolis/Cambridge: Hackett Publishing Company, INC. 1976.

Langer, Susanne K. An Introduction to Symbolic Logic. Dover Publications; 3rd Edition. 1953.

Langer, Susanne K. Philosophy in a New Key: A study in the Symbolism of Reason, Rite, and Art. Cambridge, Massachusetts: Harvard University Press. 1979.