

## SPATIAL AND TEMPORAL SEQUENCE

*Film, Animation and Design Theory - Toward a Constructed Morphology*

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**Abstract.** This paper presents an investigation of film, space, form and motion to expose issues of spatial perception. The objective is to use a brief moment of constructed moving imagery (a film scene) as the vehicle to develop a spatial/temporal sequence. The design research focuses on an examination of the procedure or process constructed by the director/cinematographer. The changing position of the camera continually changes the relationship of the frame to the viewed context. The project asks the student to interpret the spatial and temporal transformation, through the continual oscillation between foreground and background, in an effort to unravel the pretext of the singular point of view to reveal the intention of the filmmaker. The project discussed here focuses on a relationship between the projection of space in architectural representation and the production of space through complex geometries relative to temporal discontinuities and the way in which they agitate and alter one another. Drawing topological relationships between of the paths, or trajectories of movement, within a proposed scene of a film is the vehicle for investigation in this project. An event or configuration complete in itself, but forming part of the larger collection, is modeled and transformed to suggest various structural and temporal definitions with respect to spatial portrayal through the composition of time and the cinematic frame. In particular, spatial animation of a sequence of framed condition was to be explored in the development of a spatial episode.

**Keywords** Representation and Visualization, Design Theory, Animation

## **1. Introduction**

In the essay, *Body Matters*, Greg Lynn discusses the changing attitudes towards the geometric description of the human body and the corporeal metaphor in architecture. Lynn proposes that our historical use of geometric descriptions of the ideal human form as an architectural language is lacking a relationship to our reality because they lack specificity and definition of bodies in time or space. The body conceived not just in space but also in time affords the opportunity to reinterpret the body and its dynamic motion as the corporeal metaphor. The corporeal condition engaged not as a static condition, but as a dynamic event represented through temporal displacement of sequential images. When symbols are used to distinguish one thing or action from another artificial boundaries are created within the field condition of that which is naturally continuous. The continuity is divided and proportioned based on the lines that intersect it. Motion is one such continuity that can be subdivided by artificial boundaries that describe space, time and body. If these boundaries are conceived as datums that designate meaning one might begin to project space within them, therefore describing motion as line offers a way to describe spatial organizations through profile and contour. Broken into fragments of profile and contour so that it might have meaning lines may act as descriptive linguistic elements. Meaning is accomplished by making distinctions and connections between these elements.

Abstraction and mathematical manipulations of proportion and scale are means to project these boundaries through derived lines of profile and contour. The intention of this phase of the project is to develop a broader understanding of Line by studying the relationship between profile and contour as both analytic and generative operations that must undergo a subsequent transformation to be realized as architecture. The assignment is to examine the relationship between human scale and metaphysical simultaneity, examining the ways in which ambiguities can provide organizational models for design.

Lines can be produced simultaneously as profile and contour through displacements of the point of view as degrees of intensity located along the continuity of space time. In this study, we will develop an understanding of the potential relationships between the human body and architecture, a physical metaphor of architectural assembly and as an experiential phenomenon of the living/perceiving body in space. The acceptance of these two conditions, implies an oscillation between the classical idea of architecture formed in the human image and conversely the human image formed by architecture, thus making architecture both the repository for, and generator of, culture. This relationship demands of us the recognition of the

necessary alignment or resonance between architecture's physical and mental constructs.

This project seeks to re-conceive the corporeal metaphor in architecture as a dynamic spatial event. The intention is to examine the relationship between human scale and metaphysical simultaneity as generators of architectural form. Animating and modeling processes do not generate form in and of themselves, rather, they provide direction and intention that can be transformed to generate architectural form. Architects have long used multiple media (painting and sculpture, etc.) as spatial, compositional, and organizational explorations that project architectural issues and trajectories that must be transformed to become architecture. Specific topics isolated in each phase of the project (a, b & c) will expose varied techniques of representation that aid in re-positioning the discourse in cinematic or animatic terms. Those topics are; line, frame and section. These topics will provide particular operations that will focus on fundamental aspects of an animated composition.

Changing attitudes towards the geometric description of the human body and the corporeal metaphor in architecture offer the ability to reinterpret the body in motion as a dynamic spatial event. Since the time of Vitruvius architects have described space through a metaphorical, proportional relationship to the human body. This corporeal metaphor seeks to relate space and body through geometric systems of description. Description of thought and meaning is historically bound to static or linear constructs. A cinematic approach that dissects and isolates the concept/image might offer an alternative description to the linear models.

What is animation? Animation is an extensive matrix of physical, spatial, visual and temporal forces. Animation is not just a process to be executed, rather an opportunity to derive and communicate meaning through the representation of still images in a constructed sequence to imply or simulate motion. Animation and a cinematic approach to analysis of space and form through time can have a significant role in the generation of architecture and architectural inquiry and as such, has a significant role in the structuring of the architectural design process.

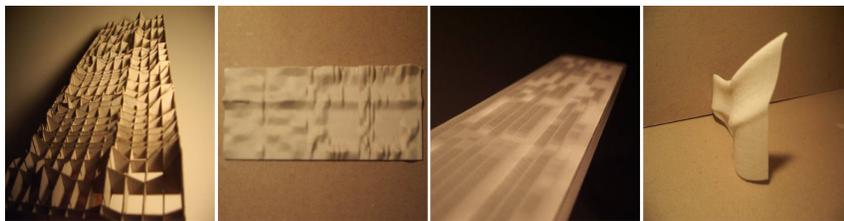


Figure 1. Studies of Spatial and Temporal Sequence (student work: Yat Him Leung)

Animation is a process of projection, evaluation and ultimately speculation. Animation is a virtual approximation of the real, it is an illusion of motion virtually projected through the sequential re-presentation of the many as a singular motion graphic. Animation and the spatial/temporal modeling of a cinematic construct is a synthetic description of space-time that simultaneously engages techniques of analysis and re-presentation. This group project will employ two modes of investigation to develop an interpretation, a Virtual Projection of time and space, surface and depth. Animation and Modeling as act, process, and product will serve as the modes of investigation. What are the specific features of time and space, surface and depth that can be animated and modeled? How are these features relevant to architecture? How have these features affected the understanding of spatial constructs in time and how might those features be translated into architecture? How can the acts of animating and modeling inform a design problem to expose what the process of animation provides to architecture and what is provided to the process of animation by architecture?

The first animated flipbooks and films were created at the turn of the 19th century. Eadweard Muybridge created the zoopraxiscope to display his animal motion studies. The fundamental principle and techniques of animation today were derived in the early part of the 20th century and perfected in the hand-drawn cartoon animations of the 1930's. In animation the illusion of movement is achieved by the rapid re-presentation of many still images in sequence. At the core of all animation is the principle that a sequence of still images re-presented through time can communicate a singular simultaneous view of the multiplicity of the images. From the earliest cell animations to the latest CGI effects all animation depends on the composition of the still image in time. The spatial consequences of this means of representation will be at the focus of this project.

## **2. (dis)assembly**

“Contemporary techniques thus constitute the beginning, and the end, of the loop, which is perpetuated and proliferated by technology. This proliferation is contingent on an understanding of technology activated within its cultural context. The interaction between technology and the user creates the possibility for qualitative cultural transformation through the transmission of behaviours that are replicated.”

—Ali Rahim, *Contemporary Techniques in Architecture* (2002)

This project will focus on a relationship between the projection of space in architectural representation and the production of space through complex geometries relative to temporal discontinuities and the way in which they

agitate and alter one another. The motive is to bring about conflicts, identify problems to solve and to resolve the resultant disconnect in such a way that it brings about unanticipated forms, temporal experiences and patterns of spatial inhabitation and formal production. Drawing topological relationships between of the paths, or trajectories of movement, within a proposed scene of a film is the subject of this project. An event or configuration complete in itself, but forming part of the larger collection, is modeled and transformed to suggest various structural and temporal definitions. The new animated sequence is developed in reference to a source segment of film with respect to spatial portrayal through the composition of time, light, shadow and the cinematic frame. In particular, spatial animation of a sequence of framed condition was to be explored in the development of the spatial episode. The capacity to simultaneously represent or re-present spatial compositions is a unique skill and a primary task of the architect.

The function of architectural representation goes beyond the description of existing or future buildings to the conceptual and literal communication of meaning and intent. While most conventions of architectural representation and communication have implicit limitations in their capacity to represent architectural space, many reveal some of architecture's latent possibilities. The traditional architectural convention of plan, for example, promotes the discovery of spatial sequences and relationships. The convention of section enables spatial alignments and hierarchies to be revealed. Drawing to scale allows the human body to be projected into the space of the representation. Digital representation, with its own set of limitations, has the potential to liberate and provoke possibilities in architectural design and representation simultaneously by configuring new representational conventions. One of these is the prospect of animate, spatial description. Another is time and the fracture of spatial sequence through temporal isolation. All modes of architectural representation, however limiting and/or revealing, are as essential in the creative process of architectural design, as they are necessary in the production of building. Implicit in an architect's ability to project spatial and formal compositions, is the capacity to describe them by challenging representational conventions and other architectural forms of representation. In this sense, the work of the architect could be defined as the task of anticipation of space in time through the construction of representation.

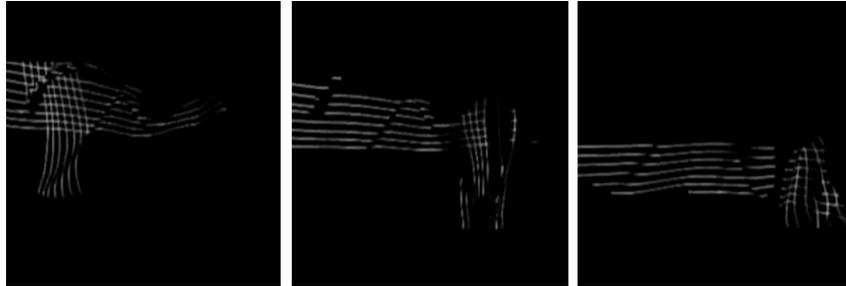


Figure 2. Transformational Sequence Study (student work: Jayanath Ranaweera)

In the essay, *Lines and Linearity*, Cathrine Ingraham (1998) observes a curious resonance between the writings of Le Corbusier, Claude Levi-Strauss and Jacques Derrida in relationship to what she refers to as the burdens of linearity. The idea that description of thought and meaning is historically bound to linear constructs is seen as a problematic condition. A cinegraphic approach that dissects and isolates the concept/image might offer an alternative description to the linear models that Ingraham discusses. The sectional implications of the cinematic or animatic models recompile the analytic in a synthetic fashion. The proportions, scales, volumes and figural organizations found within the constructs generated over the past several weeks suggest potential interpretations of spatial/temporal organizations and descriptive systems that project surface/depth. Analyze and interpret the visual artefacts you have created through a series of images (2D & 3D & 4D) that investigate the organizational systems and hierarchies of the work in question. The project asks the students to reveal ideas of scale and proportion embedded in the work through a series of sectional images that seek to describe the architectural (spatial) significance or potential of the forms. Each project is challenged to expose the spatial and temporal implications simultaneously inherent in the work. The intention is to dissect the work into its constituent parts then recombine them through a synthetic act to re-design an abstract interpretation of the collective understanding of the whole.

The intention of this phase of the project is to develop a broader understanding of Section by studying the relationship between synthetic description and analytic description as both interpretive and generative operations that must undergo a subsequent transformation to be realized as architecture. The assignment is to examine the relationship between section and description, examining the ways in which ambiguities can provide organizational models for design. Sections can be produced simultaneously as synthetic acts that serve to make connections or analytic acts that serve to isolate issues through displacements of the point of view as related to descriptive conditions. In this study, we will further develop our

understanding of the potential relationships between the human body and architecture, as both a physical metaphor of architectural assembly and as an experiential phenomenon of the living/perceiving body in space. What is description? What is section? Can the frame of an animated path constitute a section in space and time? Section can be seen as a process of description, communication and ultimately speculation. How can both synthetic and analytic descriptions simultaneously reconcile ideas of spatial and temporal displacement?

### 3. spatialized surfaces

“...witness extraordinary spatial and formal manipulations clad in metal panels that are rendered indifferent to the very geometries and spatial constructs to which they are meant to correspond. Our project attempts to overturn this dichotomy and to create a condition whereby surface and space are understood as organically linked, with geometry and patterning as the agencies for their precise resolution.”

\_ Monica Ponce de Leon & Nader Tehrani, *Versioning* (1995)

Early Renaissance theories of proportion and the relationship of the human body to mathematical projections of harmony produced architecture that was abstract in the sense that its primary aim was to achieve ideal relationships of the parts to the whole based on the corporeal metaphor to human form. The interrelationships of the parts to the whole generated simple geometrical forms that sought to reconcile the complexities of the well proportioned building. The basic concept was to generate a harmonic relationship of the vertical and horizontal surfaces to create a well-proportioned scheme. At its best, this method produced a highly sophisticated and subtle architecture that emphasized the integration of the unit at the expense of the phenomenological effect on the character of the forms brought about by movement. It was a rational design process that at times was more successful in concept than in built form.

The intention of this phase of the project is to develop a broader understanding of frame, as a concept, tool and method, by studying the relationship between surface and void as both analytic and generative operations that must undergo a subsequent transformation to be realized as architecture. The assignment is to examine the relationship between the frame and the framed, examining the ways in which ambiguities can provide organizational models for design. Frames can be produced simultaneously as containers keeping things in or containers keeping things out through displacements of the point of view as related to positive/void conditions. In this study, we will further develop our understanding of the potential relationships between the human body and architecture, as both a physical

metaphor of architectural assembly and as an experiential phenomenon of the living/perceiving body in space. What is surface? What is void? How can framing the movement of the human body generate ideas of surface as the reconciliation of space and time? The geometric development of surface can be seen as a process of description, communication and ultimately speculation. Void can be seen as the absence of description and communication that ultimately begs interpretation. What are the specific features of the human body that can be understood as surfaces and what are those that can be seen as void? How can re-presenting ideas of both surface and void, relative to the model of the form in motion you have created, simultaneously reconcile ideas of space and time?



Figure 3. Morphological Sequence Study (student work: Claudia Santos-Cortes)

The students were asked to model, animate and construct an image of the procedural sequence(s) employed by the director/cinematographer in constructing the space and time of the selected portion of the scene from your selected film. This exercise is intended to explore morphology, which is the form or structure of a thing or idea. The objective is to use a brief moment of constructed moving imagery (the film scene) as the vehicle to develop a spatial/temporal sequence. The examination of the procedure or process constructed by the director/cinematographer should be understood as the connection or relationship of several components in a particular sequence to tell a story of space and time. An action is choreographed through/against a context which conceptually reveals the space, and registers movement through time. The changing position of the camera continually changes the relationship of the frame to the viewed context. The task is to interpret the spatial and temporal transformation, through the continual oscillation between foreground and background, in an effort to unravel the pretext of the singular point of view to reveal the intention of the filmmaker.

This project focuses on the development of a representational sequence whose origin is constituted by two compositions of analysis. These elements (a frame- an image or perspective from the scene, a zone of mediation or

threshold and a site- a context or orthogonal image developed through and interpretation of the scene, an area of reflection or edge) are to be synthesized, or recomposed, such that the principal subject or narrative is the moving eye of arrival or departure. The intent is to conjure a reading of both the experiential, felt presence of motion and an external condition, which consequently destabilizes the singular vantage points of the original referents. The hybrid images/animations utilize hand drawing, modeling, photography, scanning and digital transformations to explore serial composition, repetition and/or extension.

#### **4. recombinant sequence...**

“...there occurs a special organization of space: traveling, I perceive the conjunction of a distance and a division, the juxtaposition of fields simultaneously discontinuous and open: no enclosure and yet I am never besieged by the horizon: no craving to swell the lungs, to puff up the chest to make sure of my ego, to constitute myself as the assimilating center of the infinite; brought to the evidence of an empty limit, I am limitless without the notion of grandeur, without a metaphysical reference.”

\_ Roland Barthes, *Cabinet of Signs* (1982)

Sectioning space and time to reveal analytic and synthetic relationships found in the modeling and representation of the human form in motion is the objective of this phase of the project. Through a series of animations of, in, through and around your digital model of the human form in motion reveal how your construct is an analytic/synthetic study of surface and also frames this surface study by consciously treating views as sections that communicate process and intention. The animated path around, in and through the model may be broken down into constituent parts and re-complied through spliced animation and/or it can be temporally sectioned and revealed through the motion of the view point through time and space. How can the digital model construct be re-presented in a way that reveals the spatial/organizational potential for the form in projecting architectural responses?

The objective is to simultaneously express time and space an analytic/synthetic engagement of surface and depth. Create an animation of a model that demonstrates a thorough investigation of surface and depth expressed through sectional understandings of the modeling construct. The animation should endeavor to re-present the spatiality of the human form in motion represented through motion. Spatial relationships found within the form itself and in the process of its representation are fundamental to the exploration of section both as an analytic device and synthetic technique. Use spatial motion and temporal displacement of the modeled surface to re-

present the model in a meaningful way. Model, and fabricate a physical construct that develops a constructed morphology based on the work developed in project 2a. The constructed morphology should result in a surface study that of a new recombinant sequence(s) constructing the space and time of the previous interpretation of the selected portion of the scene from the selected film.

This exercise is intended to extend the exploration of morphology, which is the study of the form or structure of a thing or idea. The objective is to use the previous project 2a study of the processes or procedures of space and time used by the film maker/director as the vehicle to develop a spatial/temporal surface that can be understood as a new recombinant sequence of the parts into a new whole. The examination of the procedure or process constructed by the director/cinematographer should be understood as the connection or relationship of several components in a particular sequence to tell a story of space and time. The task is to interpret the spatial and temporal transformation, through the continual oscillation between foreground and background, in an effort to unravel the pretext of the singular point of view to reveal the underlying structure of the filmed sequence of image, space, depth and motion.

This project focuses on the production of a physical spatial object/surface that is the morphological extension of the procedural operations of the film sequence that serves as the vehicle for this study. Time and space through motion and image are interconnected in both film and architecture. Sequence and didactic systems of representation are fundamental to both areas of design research. This project asks the student to consider how a sequence might be taken apart and recompiled in a new way that is critical and creative with the assemble - deconstruct - reassemble work flow. The project should develop a value-forward design process that is self-critical and self-aware in the pursuit of the fabrication of the physical artifact.

## **5. Conclusion**

The project discussed here focuses on a relationship between the projection of space in architectural representation and the production of space through complex geometries relative to temporal discontinuities and the way in which they agitate and alter one another. Drawing topological relationships between of the paths, or trajectories of movement, within a proposed scene of a film is the vehicle for investigation in this project. An event or configuration complete in itself, but forming part of the larger collection, it is modeled and transformed to suggest various structural and temporal definitions. This subject is analyzed with respect to the spatial portrayal of

sequence through the composition of time and the cinematic frame. In particular, spatial animation of a sequence of a framed condition was to be explored in the development of a spatial episode.

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