

## SPECULATIVE ASSEMBLAGES OF A DIGITAL PROCESS

*The investigation of hybrid digital media as a pedagogical device*

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**Abstract.** Within a digital-design pedagogy is opportunity to construct a design process working non-linearly in explicit systemic, conditional, and metaphorical operations. In the use of digital modeling and animation, speculative design methods develop across a series of incremental investigations that are structured, rather than dictated, by the particular architectural issues of composition and concept of place. By accommodating the diversity of such inputs, and testing the variable layers of output, new discrete compositions in the form of digital *assemblage* recombine and translate a series of logical premises and processes that resolve in non-prescribed outcomes. This paper identifies, through the work of two students, experimentations with computer-aided design that suggest the potential for hybrid design methods relevant to the exploratory nature of a digitally-inclined architectural pedagogy.

### 1. Introduction

Contemporary architecture continues to value the Modern position that multiplicitous phenomenon as symptomatic of valuable and interesting complexities (Venturi, 1966). While the analog design processes of mid-century Modernism remain pedagogically relevant in the instruction of architectural design, the challenge to effectively introduce contemporary digital media to such traditions remains. Presented here are two academic studies that endeavor to uncover such opportunity through an exploratory design process involving the hybridization of digital modeling and digital animation. By compositionally translating both the media of animation and

the media of static image, they seek paths through traditional architectural conventions towards new and speculative virtual spatial relationships.

The compositional techniques employed are based on a method of compositional layering often associated with collage or montage. Montage is typically defined as a drawing that is made of an assemblage of different forms in a composition. An architectural idea is typically communicated through some method of assemblage, as seen in a typical set of plan, section, and elevation drawings. Animation can be considered as a type of temporal montage, in that within montage are co-present layers of line and surface, but in a temporal montage, the connections the lines make and the characteristics of a surface can change over time. The form of animation becomes a polymorphism, a combination of ideas and/or operands that create at least two or more related results that may or may not be immediately recognized as related (Eisenstein).

## **2. Two-dimensional artifact to animation**

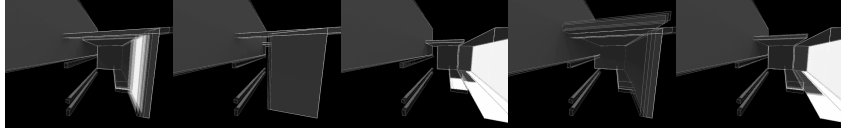
This first analysis begins with the basic understanding of a painting as a two-dimensional object evoking an interpretation of image and/or symbol (Benjamin 1968). The underlying goal of this investigation is to penetrate the operation of painting as solely a representative device. Formal, spatial and aesthetic qualities of the painting provide the foundational structures for a translational process to place the painting outside of its direct context and into a tracked process of making. (Rose 2006)

In the case of *Taureau III* by Le Corbusier, the most direct interpretation is that of a single outline depicting both a man and a bull simultaneously. Moving beyond this symbolic idea, there are compositional layers that divide the painting into three parts vertically. The color masses give the painting depth, as some colors read at the forefront while others recede to the back.

Within this compositional reading lie many sub-readings, including ideas about time through the morphology of the composition's color regions while presenting all morphological versions simultaneously. These regions are themselves connected by a single line that connects all parts of the painting. In this light, the composition reveals a topological pattern, which in turn speculates a new contracted process concerning the painting's origin. Thus, the method for future additions or subtractions can be based on the structure provided by the existing artifact.

The animations illustrated in Figure 1 translate the set of morphological regions from the painting into a set of digital volumes, lines, planes, and spaces. The connection between this set of digital objects is created through

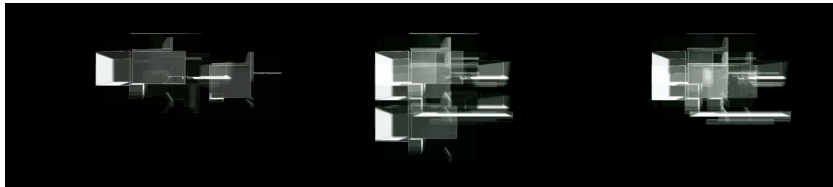
the manipulation of virtual light, transparency, and animating blurring effects.



*Figure 1.* One of eight translation sets from original artifact.

In the animation shown in Figure 1, faces and points animate based on a repeat behavior temporarily extending, shortening, or inverting the masses. In between each frame are four sub-frames. These sub-frames trace the paths of the moving faces. Eight animations are made, each with a different composition. The animations are then arrayed into an image sequence. From this, a collection of frames is selected to create a composite animation, as seen in Figure 2.

The animation shown in Figure 2 uses digital video tracking software to produce many new combinations of overlapping frames while incorporating compositional ideas from the original painting. The production controls the time between the frames and emphasizes the transition from one frame to another. The layers of the animation become more complex through temporal and spatial overlap and syncopation.



*Figure 2.* Montage construction through rhythm and transition

The frames chosen from the constructed montage are put together in an action script movie allowing the viewer to choose the composition shown in Figure 3. There are three sets of the same set of compositions. Each set can be changed, scaled, and moved within the virtual frame. This movie provides a way to generate a vast collection of virtual montages. The interaction results in a hybrid experience that is perceived as more physical because it provides a parallel connection between body and other sensory experiences, via the action script interface, similar to interaction with physical space.

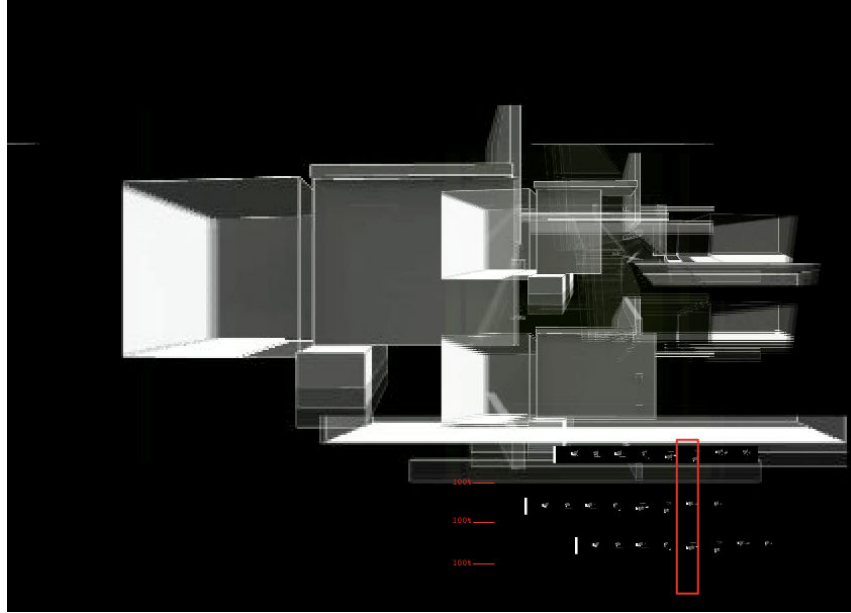


Figure 3. Interaction with digital composition.

### 3. Three-dimensional model to *montage*

Building on the first study, this second exploration begins with a conceptual analysis of a proposed building program, in this case a Washington, DC broadcasting headquarters for Public Radio International. Beginning with a historical analysis of the practice of free speech in the United States and the role of Journalism in political discourse, there emerges a conceptual agenda with the theme of “trajectory”, emphasizing the recording of events in the present while indexing their historic path. This informs the architectural proposition, in that the goal of the design must attend beyond the symbolic, and seek a process that melds cross-disciplinary themes into a language of tectonics and aesthetics.

Initial studies test abstract conditions of “trajectory” defined through operations of figural proportion and relative configuration. By working with digital animation, these conditions were investigated through the manipulation of simple modeled volumes. As seen in Figure 4, the range of values assigned to the properties of each element, such as object dimensions and relative spatial position, loosely coincides with the diversity of spatial conditions required in the proposed architecture.

With the generation of this set, an iterative method of *montage* emerges that exploits the key-frame structure of the digital animation. Figure 5 illustrates a composite of the animated objects' geometric extents, layered across regular increments of time.

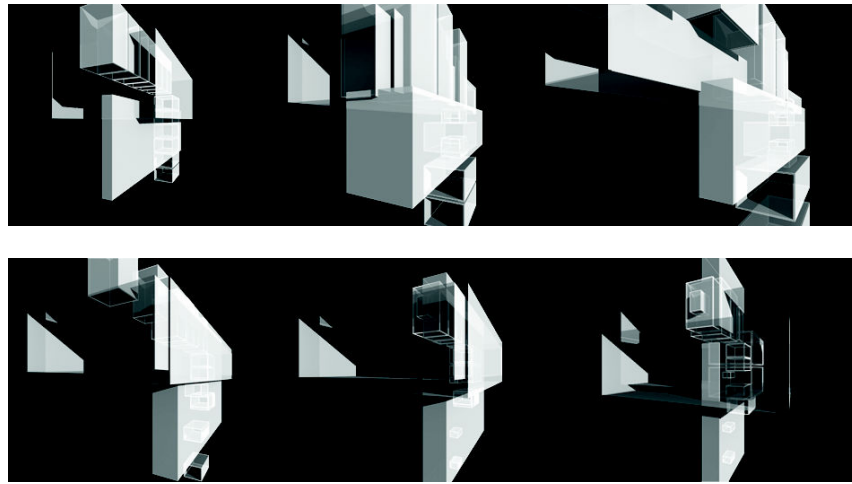


Figure 4. Static frames from original animation.

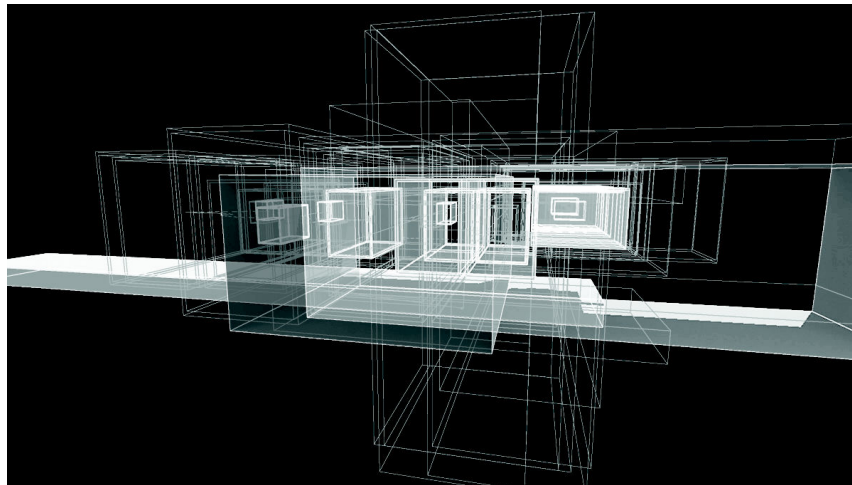


Figure 5. Montage, figure & composite traces.

In this composition, the figure of a specific point on the animation timeline is distinguished among its rhetorical context. The montage dissolves the diachronic relationship of geometries, and instead biases the singularity of the apparition of a static whole and the simultaneity of its constituent parts as they vary state over time. The process produces, then, an abstract formal foundation, a virtual spatial structure, based on a translation of the core concepts of the original design intent.

Subsequent introduction of quantitative architectural context, such as site geometries and programmatic spatial requirements, refines the designer's editing system. Configurations of architectural units can be tested within the framework of *montage* figures. The wireframe drawings in Figure 6 illustrate an analytical series of programmatic configurations. The overlap of these diagrams reinforces a qualitative speculation of spatial experience, as later (or rather, simultaneously) revealed virtually by three-dimensional views of the digital model.

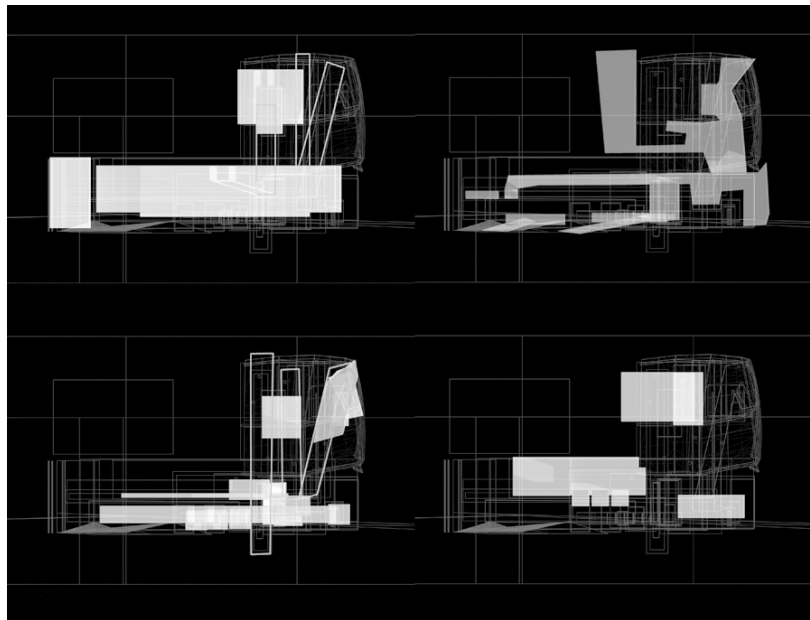
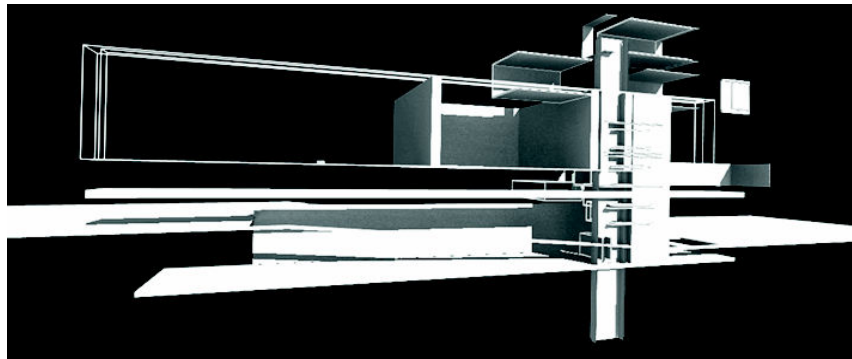


Figure 6. Montage, testing overlapping configuration strategies of program & circulation.

#### 4. Potential and further application

In both case studies, the static montage can be leveraged for its spatial qualities as both a two-dimensional image and three-dimensional model. The architectural contexts of site and program further provide quantitative parameters to the digital model (Figure 7). These parameters begin to inform the editing of selected points in the digital animation, leading to the transformation of geometries, planes, and lines from diagrammatic representations to tectonic conditions (Figure 8). The value of these processes of animate dimensional translations lies in their ability to accommodate analyses of non-spatial input. The potential lies in the opportunity to provide a digital path to an authored, developed, and editable system of representation that could produce new representational artifacts to describe spatial speculations rooted in cross-disciplinary ideals.



*Figure 7.* Digital montage, reintroduction of architectural conditions of site and tectonics.



*Figure 8.* Physical montage, reintroduction of architectural conditions of site and tectonics.

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