ABSTRACT
How we understand the world is directly affected by our position in it. Constellations are simply the result of cognitive alignments related to our location in the universe, the horizon simply based on proximity and time. Relative Positioning explores the power of position in architecture: specifically, how anamorphic projection and perspectival techniques can generate space and challenge our understanding of its form.

Architectural illusion and perspectival deceptions have been investigated since antiquity in order to alter the perception of a given space, primarily used in an illusionary or optical manner. However, Anamorphic projection offers the potential to create dynamic spatial experiences that go well beyond simple projections or images/shapes simply painted onto a surface. Within Relative Positioning, architectural form exists in 3-dimensions (real, physical) but is perceived via procession and emergent perceptions based on choreographed alignments and foci—making it possible for a duality of visual perception to occur. Much like the diagonal movement through Villa Savoye or the space created by Matta-Clark’s cut, views and alignments add value and create perceptual shifts in order to elevate an awareness of space that is beyond the physical: a sensual and cerebral environment within which to dwell, a spatial ambiguity that puts pressure on the ‘real’ and opens up a world of wonder and excitement.
RELATIVE POSITIONING _ INTRODUCTION

How we understand the world is directly affected by our position in it. Constellations are simply the result of cognitive alignments related to our location in the universe, the horizon simply based on proximity and time. Relative Positioning explores the power of position in architecture: specifically, how Anamorphic projection and perspectival techniques can generate space and challenge our understanding of its form.

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The word ‘anamorphosis’ comes from the Greek: ana-‘back, indicating a return toward, and morphe- ‘form’, and is defined as a projection of forms outside their visible limits. Viewed from a precise vantage point (the convergence point of a geometrical construction) the distorted image recovers a recognizable form, and as has often been observed, the projected image seems to lift up from the actual surface of the anamorphosis itself.

—Anamorphosis, An Annotated Bibliography, Alberto Perez-Gomez and Louise Pelletier

Early cave paintings from Chauvet (Figure 2) and Lascaux reveal a sense of wonderment and thought that are animated both by the content of the paintings but also the contours on which the paintings fall. The undulating walls of the cave and the play of light and shadow must have produced a powerful affect to those that created and observed the work. In some cases the animals were depicted with multiple legs or heads in various positions not only to imply motion, but activate a real perception of movement. As the observer moves throughout the cave, the changing form due to the undulating walls adds to the sensation of motion, becoming cinematic. These early ‘projections’ not only questioned humankind’s place in the world but also provided one of the first examples of how humans see that world. Although not directly intended to be ‘anamorphic’, these paintings are the first to establish a point of view and with it, a new understanding of place and time.

General ideas of using scale to imply spatial depth have existed since the 5th century B.C., but it was not until the early Renaissance that painters began to experiment...
with these techniques to create a single, more unified theme rather than a collection of various scenes. Brunelleschi, Bramante, Michelangelo and other artists, began to experiment with this intuitive perspective, but it was not until decades later that Alberti developed a mathematical basis for linear perspective. This new method allowed the observer to experience the work as an engaged participant rather than just an observer. “Linear perspective, as first developed in the Italian Renaissance, produced a centralized disembodied viewpoint and subject position analogous to what the seventeenth-century French philosopher Rene’ Descartes called the ‘mind’s eye’” (Note 1).

Born from studies in corrected perspective, anamorphosis became a technique that highlighted a singular point of view where an image would be revealed as one moved past the painting or through an architectural space. In DaVinci’s Codex Atlanticus (Figure 3), we find one of the first examples of an anamorphic drawing. DaVinci experimented with this technique to develop a method to correct or compensate for natural distortions in ones visual field. His experiments with optical vision and artificial perspective led to a general understanding of what we now call anamorphosis. Around this time there is also a small but significant use of anamorphosis by Piero della Francesca in his work Virgin with Child Saints and Angels from 1474 (Figure 4). In this painting there is an oval shaped form painted anamorphically so that when viewing the work from the desired point of view the oval form becomes a perfect circle. Anamorphosis was later mathematically refined in 1663 by Jean Frabcois Niceron (Figure 5) who was able to develop anamorphic images using a geometric key that utilized a foreshortened distance point method.

In most cases the early examples of anamorphosis were produced as a means to hide objects and symbols in painted works. The most famous of these hidden paintings is found within The Ambassadors painted by Hans Holbein in 1533 (Figure 6). In this iconic work an anamorphic scull is hidden at the bottom of the painting. Viewed frontally the scull is distorted and unrecognizable, but when viewed at an oblique angle and from the side of the painting, the image comes into focus.

Following this, from Hoogstraten’s anamorphic boxes to the scientific work of Adelbert Ames, anamorphosis has evolved into a method of sensory experience where the relationship between the observer and the subject was becoming blurred. Within art, philosophy, and science, the role of the observer was becoming increasingly poignant. Focus was shifting from the subject toward the observer and their experience viewing a painting or architectural space. These ideas are apparent in Cubism, Dada and Surrealism, and continue with the contemporary work of Felice Varini and George Roussee (Figure 7, 8), as well as James Turrell and Robert Irwin, whose work focuses on the immersive and atmospheric qualities of the environment.

While the project includes the investigation of surfaces that toggle between the perception of 2- and 3-dimensions (an investigation of flatness and surface as much as the
construction of spatial depth), anamorphic projection techniques in architecture offer the potential to create dynamic spatial experiences that are three-dimensional and go beyond simple projections; more than images/shapes simply painted onto an architectural surface, or even 3-dimensional artworks and installations. Relative Positioning by its nature is an architectural investigation that demands one to move beyond these singular moments to a totality of space that is ultimately choreographed by ‘the other.’ The physical inhabitation of space (what the surface alone can never offer) means that the participant is free to move off of the ‘designed’ cone of vision, a realm that actually dominates one’s time spent within the building or landscape.

It also means that unlike Kuleshov’s experiments (Note 2) and Eisenstein’s cinema, architecture is in large part driven by programmatic considerations, addressed by the design of fundamental elements (stairs, ramps, apertures for light). The need to satisfy the functional, programmatic requirements architecture demands becomes both the trigger and the beneficiary of the anamorphic system, as this realm is where affects such as color and reflectivity serve to smooth (Note 3) the seam of spatial transition between multiple cones and foci that overlap, collide, and contribute to a whole much larger than any single vantage point. As an architectural work, this is also where the project both shares with and differs from other contemporary investigations and artists, such as Felice Varini who states:

“My concern is what happens outside the vantage point of view. Where is the painting then? Where is the painter? The painter is obviously out of the work, and so the painting is alone and totally abstract, made of many shapes. The painting exists as a whole, with its complete shape as well as the fragments....”

Yet he goes onto add that his work:

“... is not born to create specific shapes that need to satisfy the viewer.”

Within Relative Positioning, the satisfaction of programmatic and architectural needs is precisely what determines the design of the anamorphology as a system that seams the various worlds of function and perception therein.

In this way, the potential of the architectural exploration by nature exceeds the possible impact of tromp l’oeil and other tricks of the eye: the project examines the generation and perception of physical space experienced across time, where transitional spaces enter the conversation in their own right, with their own affects and impacts outside of any ‘content’ conveyed at the moments of greatest alignment (i.e. a number, machine gun (Figure 9), circle...the image/icon with political, cultural import, etc.).
Digital 3D modeling tools such as Rhinoceros allow for precise construction via the viewport where all spatial and formal affects can be tested from within the software (lighting, reflectivity, parallax, etc). By using this process to make space, a reading of space emerges that is both real and perceived. The forms exist in three dimensions (real, physical) but are perceived via procession and emergent perceptions.

Technically, forms are either projected to the point of the viewer or objects within the space are positioned along and within the perspectival cone that causes a change in scale and, depending on the point of view, a shift in relation. By using both of these methods (Figure 10-13), forms come into alignment as one moves closer to the focal point.

Here, the cone of vision becomes an essential element within the generation and experience of architectural space. That digital tools offer the ability to calculate and visualize this cone is not a matter of convenience as much as further recognition that the perception of both visual and physical space relies heavily on the mechanics of the eye. What the cone of vision offers is a boundary within which one can play or challenge in terms of the design and construction of form and space. While the moments of greatest alignment may intend to communicate [meaning/message/content] as did the traditional ‘classical gaze,’ the project simultaneously capitalizes on the cone of vision as an ever-changing field dependent upon the participant’s chosen path (Figures 14-16).

Therefore, moments of greatest alignment are not the culmination or ‘punch line’ of the experience, but rather the set-up or touch-point for another ‘main event’ that is just as important: the experience and challenge presented by the ‘non-aligned space,’ the space between these punctuated moments of visual, geometric clarity and ‘content’ (Note 4).

This is not a traditional formalist endeavor but rather the form is a direct result of relative positioning as one moves through the space, where views of fragmented and continuous space add to one’s sense of spatial ambiguity. Since the spaces created have multiple focal points, AND forms might share multiple foci, the space is constantly vibrating based on the viewer’s proximity to the focal point—a visual flipping or slippage. The object(s) of form are constantly changing according to the adjacencies of other formal objects AND the point of view of the observer. In this sense, both physical and virtual object-forms are created that allow for a new experience of the space.

By perceiving the alignment of determined form and the subsequent disjunction of that form, one is able to participate in the spatial experience rather than simply ‘viewing’ it. In this sense, movement through the space is animated and the subject/object relationship is questioned. It enables one to be an active participant within space-forming and convey a sense of sensation that a ‘static’ space cannot. The apparent flattening of space through...
material qualities and the formal techniques of Relative Positioning make it possible for a duality of visual perception to occur, the emphasis is not illusionistic, but immersive through the act of peripatetic seeing (Note 5).

In this respect, the project doesn’t seek to ‘trick’ the eye, but to elevate an awareness of the space that is beyond the physical—to draw the eye forward and through its own expectations, in essence to offer up to the eye more than it originally anticipated: a sensual and cerebral environment within which to dwell. Here, the form is a product of spatial shifts, a parallax affect where forms (and material affects) come in and out of focus and exist as part of a larger collection of experiential moments, where movement through the space activates both conditions (aligned and non-aligned) without pre-determined, linear sequence.

These tensions of object-qualities elicit a spatial ambiguity that puts pressure on the ‘real’ and opens up a world of wonder and excitement. We become participants in this new environment. Here it is OK to question where illusion is physical and ambiguity is desired. This is a new form of collage.

ACKNOWLEDGEMENTS

Images not produced by the author are used by permission, as follows. Figure 1, Gordon Matta-Clark, ‘Circus’ (1978), Courtesy of MACBA. Figure 2, Courtesy of Arnaud Frich, Centre National de Préhistoire, Ministère de la Culture et de la Communication. Figure 3, Courtesy of Biblioteca Ambrosiana. Figure 4, Public domain, part of a collection of reproductions compiled by The Yorck Project. Figure 5, Public domain, Courtesy Centre d’Études Supérieures de la Renaissance, Tours. Figure 6, Holbein’s “The Ambassadors”, Public domain, digitized by the Google Cultural Institute from a collection at The National Gallery, London; Holbein’s detail of skull from “The Ambassadors”, Public domain, Courtesy Thomas Shahan, Wikimedia Commons. Figure 7, Courtesy Joe deSousa via Flickr, Creative Commons Public Domain Mark 1.0. Figure 8, Courtesy Bernard Blanc via Flickr, Attribution-NonCommercial-ShareAlike 2.0 Generic (CC BY-NC-SA 2.0). Figures 9-16, Courtesy of the author.
1. In Anamorphosis through Descartes or Perspective Gone Awry, Lyle Massey writes: “Not only does perspective fail to conform to a Cartesian model, it even contradicts it in many ways. Early modern artists and mathematicians struggled to relate geometry to representation and vision to space and in the process they gave visual form to a split between mind and body.”

2. Lev Kuleshov was a filmmaker from the 1910’s and 1920’s who experimented with the relationships between imagery and one’s implied meaning through juxtaposition.

3. In Seaming (Thesis, Princeton University, 2005), I explore “the tension between two methodologies by generating a specific collision of initially autonomous programs within the restriction of a given frame. Focusing on the consequent spatial conditions that arise from this intersection, the project seeks to question our alternating perception of the fragment and/or whole via methodological strands that represent these two polar attitudes: disjunction (fragment-philic) and smoothing (fragment-phobic).”

4. In A Picturesque Stroll around Clara-Clara, Yve-Alain Bois writes “We know that Eisenstein disagreed with Kuleshov (and others) on one fundamental point: he did not want montage, the experience of shock, to involve only ‘the element between shots,’ but wanted it to be ‘transferred to inside the fragment, into the elements included in the image itself.’”

5. “In this context it is not the work as such that would interest us, but rather the path toward the work, our pathfinding toward the point of view. The study of the figure / ground antinomy would have to be replaced by an analysis of the process of figuration.” From Common Places and Particular Perspectives by Bernard Fibicher.

REFERENCES


MIKE MCKAY

Mike McKay is an artist and designer currently teaching at the University of Kentucky College of Design. He received his Bachelor of Architecture from the University of Kentucky and Master of Architecture from Princeton University. McKay’s work focuses on the intersection of collage, painting, digital media, and large-scale, process-driven investigations that explore the tension between form and material. Current and recent projects range in scale from urban landscapes to buildings that investigate material assembly. McKay’s paintings, mixed media work, and installations have been exhibited in Germany, France, England and throughout the United States.