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**Abstract:** The *Transience of Light* was an optical light installation that explored the idea of shaping the material world as something that keeps changing within space and time. The design held many hidden qualities that became apparent only when the viewer was in motion. In this way the piece enticed pedestrians and commuters to engage in the perception of a dynamic, flickering and spiralling vision as they moved past the window. In reinforcing the relationship between the viewer and the viewed, the design created an effect beyond itself and placed the viewer's perception as the primary medium that was being manipulated. In doing so the installation sought to bring into focus the potentials that lie within the immaterial nature of the urban façade and to amplify the beauty of the transient and the ephemeral that can charge our urban spaces with a deeper dimension of curiosity and wonder.

**Key words:** dematerialisation, gestalt, phenomenology, perception, ephemeral

## Transient Materiality

### Introduction

The aesthetics of dematerialisation is one of the abiding conditions that define the sensory experiences of the contemporary city. In the last hundred years the imposing stone solidity of nineteenth century construction has been replaced by the structural expression, minimalist detailing and transparent and translucent skin of contemporary architecture. This phenomena can be seen most clearly in the refractions, reflections and plays of light mirrored in the plate glass windows of retail stores and the curtain walls of the modern skyscraper. The origins of this aesthetic can be traced back to the seminal works of Mies Van der Rohe, such as the Barcelona Pavilion, Seagram Building and the Neue Nationalgalerie, in which minimal structural frameworks support vast glass planes that seem to float impossibly as wafers of reflected light and imbue the buildings with a free flowing and expansive spatial dimension. These structural and material conventions can be seen as a defining element in the idiom of urban architecture in the twentieth century.

The manipulation of the condition of dematerialisation has more recently been used consciously as an aesthetic intention in contemporary art and architecture. In the nineteen seventies the conceptual minimalism of artists such as Robert Irwin and Dan Graham, employed the use of transparency, reflection and illusion to destabilise one's preconceptions of the physical world, in order to bring into question the relationship of the viewer in the completion of a work of art. The perceptual manipulation of such artists has, in time, been assimilated within the vernacular of contemporary urban architecture. James Carpenter, an artist who works closely with architects, uses such techniques to activate and animate the viewers' experiences of architectural space. Carpenter seeks to exploit "the unique opportunities afforded by the transparency, reflectivity and structural strength of glass, controlling the intangible force of light as it affects the spatial

and temporal boundaries of architectural spaces. His goal is to animate transitional spaces of urban architecture and engage the viewers in a rich and complex understanding of their surroundings" (1998). While Jean Nouvel, in buildings such as the Cartier Foundation in Paris, uses the materiality of the glass façade, to confound traditional notions of the building as definable object. Yiu describes Nouvel's architecture as an attempt to construct "a space that works as the mental extension of sight, performing a type of vanishing act that leaves the viewer wondering where the object went, the goal is to render ambiguous the boundary between materiality and non-materiality, between image and reality" (2003).

In the *Transience of Light* installation, which was designed for the front window of the Euroluce Melbourne showroom as part of the State of Design Festival (2011), the immaterial nature of contemporary urban glass façades was viewed as a medium that is most commonly experienced in relation to the constant flow of traffic and movement that the intertwined thoroughfares of the urban grid generate. The consideration of the conditions of translucency and transparency of the urban environment and the experiential phenomena generated via the viewing of these conditions whilst in motion, suggested that it is possible to conceive of design interventions within the city that respond primarily to the conditions of immateriality and movement within time. The festival's themes of the use of transitional spaces and ideas of the transformative, the active and the activating, intersected conceptually with a number exploratory sculptural works and design projects I had been developing. These works investigated how the idea of transience, something that keeps changing within space and time, can be employed in order to develop design responses that focus and amplify the perceptual potentials which lie within the immaterial nature of glazed architectural façades. The generation of a design methodology that encompassed such observations and concerns involved a shift in the principle foundations of the creative act, where the conception of design as the arrangement of static objects in space was supplanted by one where the manifestation of fields of phenomena were used to shape the perception of the ephemeral dimensions of our physical reality.

### Optical Syncopation

The development of an appreciation of the immaterial, translucent and transient nature of the contemporary city involved an engagement with the qualities of both physical effects and psychological affects and sought to marry the relationship between light and materiality with the principles of the gestalt theory of perception. Gestalt psychology proposes that we primarily recognise patterns and relationships, not objects. In this thinking the idea of the field replaces the notion of discrete isolated particles. Yontef suggests that such a field is "a whole whose parts are in immediate relationship and responsive to each other in which no part is uninfluenced by what goes on elsewhere in the field" (1993). The adoption of the precepts of gestalt theory as a means of generating vibrant optical fields can be seen within the work of Op artists such as Bridget Riley and has been explored in more three-dimensional and sculptural terms through the work of Jesus Soto and Eusebio Sempere. In these artist's works the creation of an illusory optical affect caused by the gestalt field becomes the primary aesthetic concern and in doing so brings into question the relationship between the object and its perception. The contemplation of these properties led to the consideration of how it may be possible to begin to conceive of works of art and design whose composition would create perceptual gestalts which transfigure solid form into overlapping fields of interference patterns. In such works the creative intention was to move design away from a preoccupation with objects in space to the crafting of patterned surfaces and optical affects in which the construction of visual rhythms and illusions emanated from a systematic application of overlaid geometric orders.

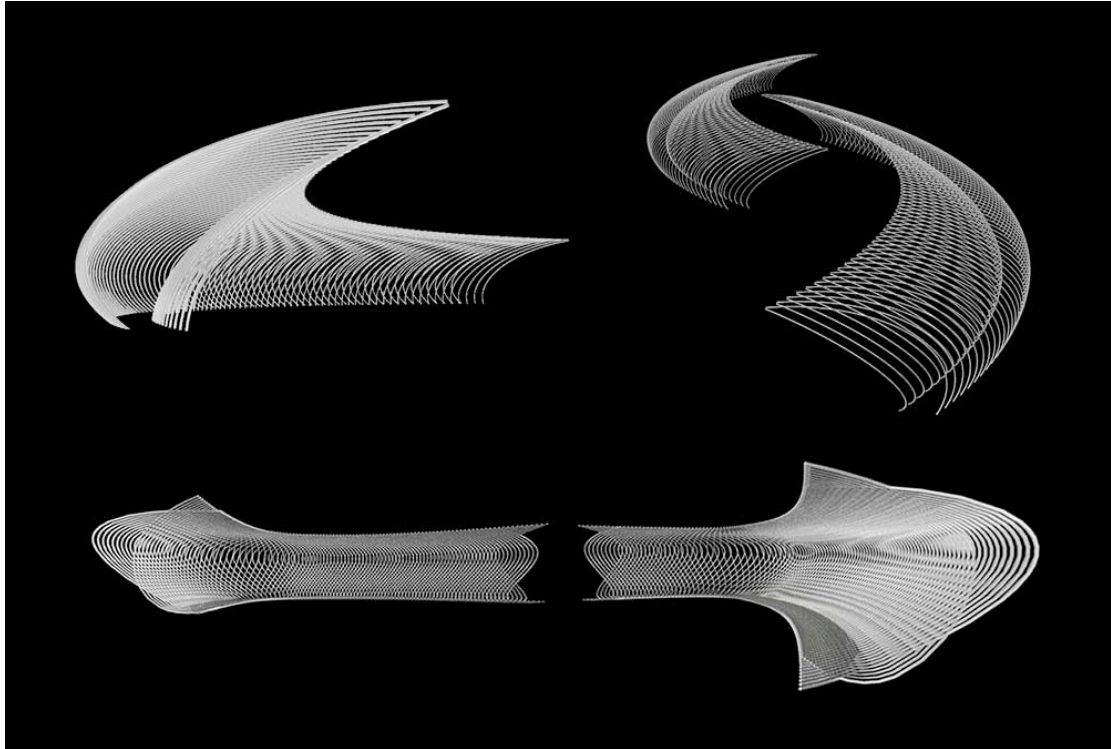


Figure 1. Optical Syncopation

The project began with the production of a series of studies in which subtle moire affects were generated through the slight displacement of the arrangements of elements. From these simple exercises it became apparent that it was possible to begin to think of the generation of architectonic structures in terms of their field-like properties and the conscious manipulation of their secondary perceptual affects. Through the careful juxtapositions of the optical relationships between dual layers of elements, it became possible to create complex rhythmic effects and to dissolve a form into an apparent immaterial essence. The resultant arrays of these pieces held many simultaneous affects that would make the perception of the pieces oscillate between one perceived condition and another. I termed this quality 'optical syncopation', a condition in which the apparent dominant visual hierarchies within a piece are interrupted by the presence of other layers of pattern, which in turn create apparently changing gestalts within the unified whole. It was noted that these effects would constantly alter as one moved past, around or through the structures, so that the viewer's movement would animate the work. With this in mind, the structures began to be considered as prototypes for urban transit spaces so that they acted as interactive dynamic systems, which would set up a complex responsive relationship between subject and object.

### Fibonacci Sequences

The next series of investigations of the manipulation of optical syncopation and its employment in creating active and engaging visual conditions involved an examination of the properties of the Fibonacci sequence and the various geometries that can be derived from its principles. The first experimental works in this series involved the overlaying two identical images of the Fibonacci Spiral pattern on top of each other and then slightly rotating one of the layers. In doing this, an amazing quality of the pattern was exposed. Small changes in the alignment of the dots would produce a complete change in the perceived patterns. As the alignments changed, an endless array of arrays would present themselves. It was then discovered that a similar affect could be achieved if the layers of spiral dot patterns were aligned with each other but separated by a reasonable distance. In this case, when the two planes were viewed from an

angle, their superimposition would seem to create a changing field of moving patterns as one's vision moved across the surface. These observations were tested through the production of a sculptural work made from sheets of acrylic, entitled *Plenum*. In this piece, acrylic sheets were laser etched with the Fibonacci spiral pattern and positioned at ten millimetre intervals.

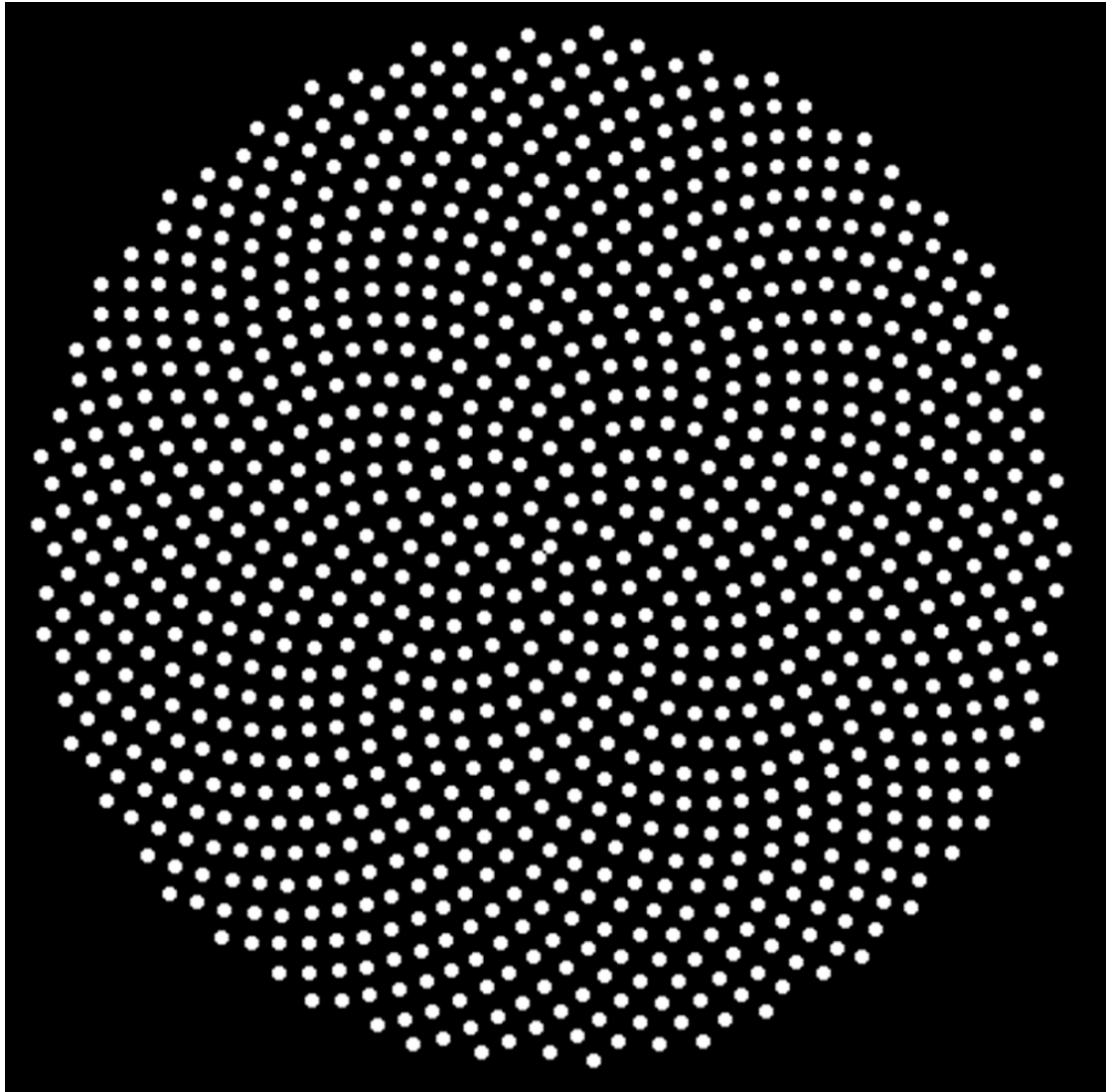


Figure 2. Fibonacci Spiral Pattern

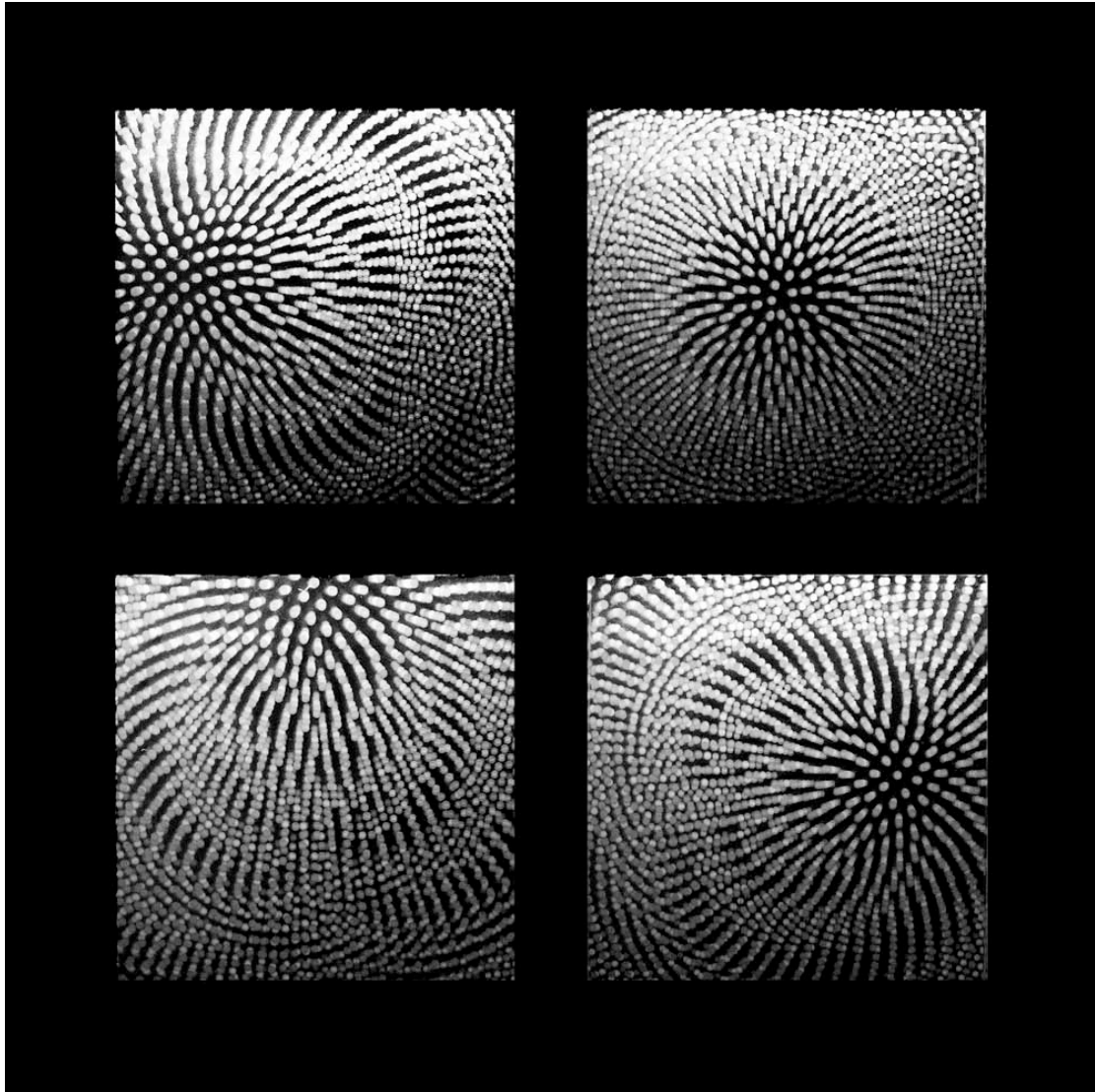


Figure 3. Plenum

These elements were then positioned above a series of strips of LED lights that ran along the edge of the assembled planes of acrylic, causing the dot patterns to glow brightly in contrast to the darkened background. This effect utilised the principle of total internal reflection, in which the rays of light emanating from the LED's traverse the transparent sheets at such an angle that they reflect off the inside the polished acrylic surfaces and fill the acrylic sheet with light. When this light meets the etched surface of the spiral pattern it is diffracted and escapes the acrylic sheet as a glowing luminance. These discoveries led to the consideration of the use of such techniques in the conception of the design of glass walled building facades, in which the composition and the careful alignment of patterns and planes, would seem to contain a changing condition of spiral geometries, that transformed when viewed from different places and different times of the day and night.

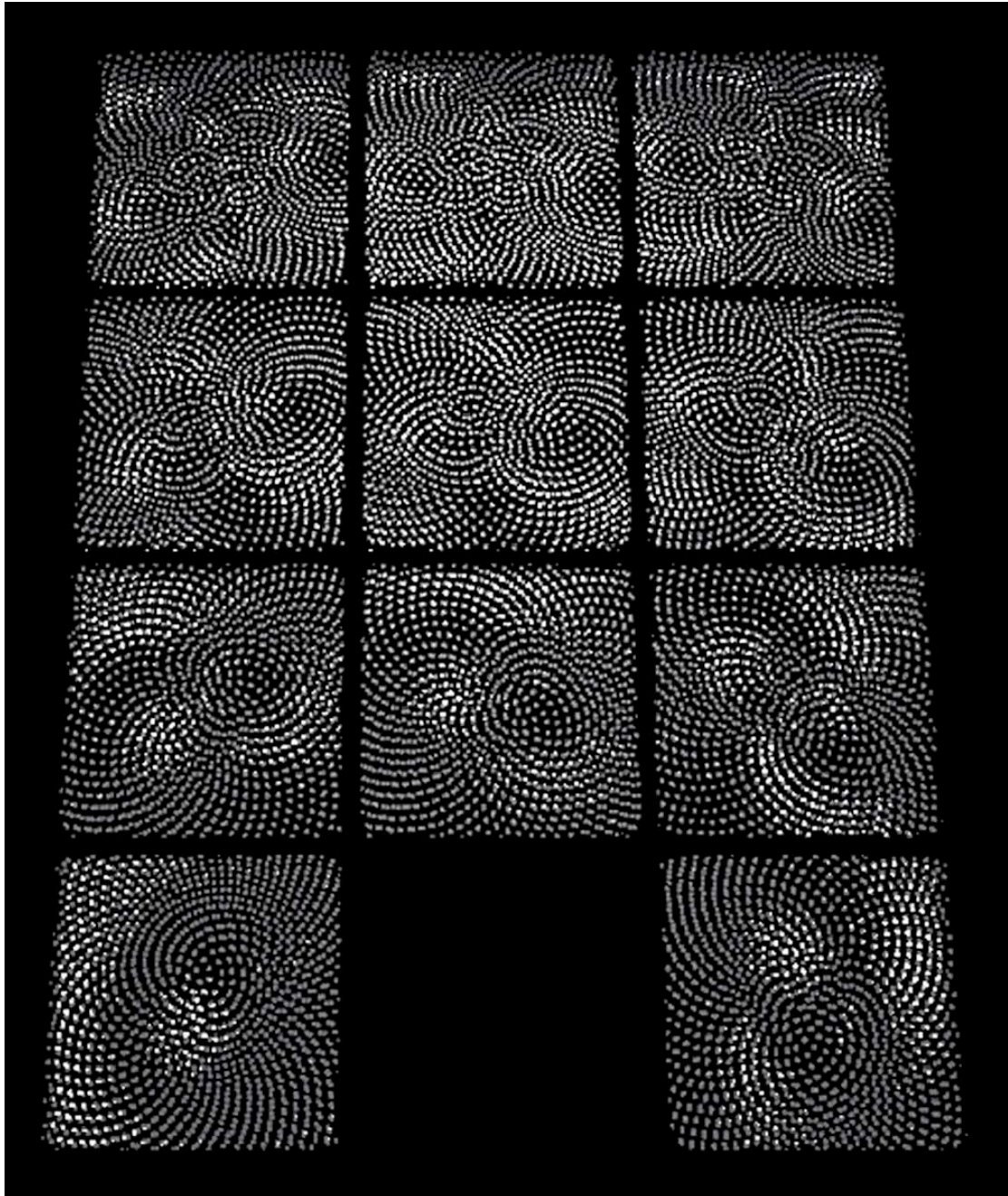


Figure 4. Spiral Façade

With the principles of the optical affects of layered patterns established, I sought to develop a Fibonacci geometry that was related more directly to the rectilinear nature of contemporary glass curtain wall, high rise buildings. This investigation began by taking the principles of the numerical Fibonacci sequence, in which each number is added to the previous number to create an exponential progression (0,1,1,2,3,5,8,13,21,.....). Using this system, a pattern was generated that translated the numerical sequence into a series of geometric strips, which represented the numbers as rectangular forms. These rectangles were organised in a progressive arrangement, which expressed the Fibonacci sequence both vertically and horizontally. In creating this repeating geometric code, a periodic spiral pattern manifest itself as a longitudinal wave form, reminiscent of a double helix, which ran horizontally across the frieze. With the principles of the rectilinear Fibonacci pattern established a series of experiments were conducted on the layering of these patterns in a three dimensional array to create optical affects. As in the spiral experiments it was possible to achieve a flickering and shifting apparent movement in the layered patterns. The rectilinear geometry

also afforded the creation of dynamic perspective qualities within the layered screens and gave the implied spiral form a three-dimensional quality. As in the circular spiral pattern, as one's vision moved across the design, a number of different interference patterns would become apparent. These secondary optical affects would manifest as star bursts and shifting densities of parallel lines which when aligned would dissolve the perception of the overall configuration into a flattened spatial illusion.

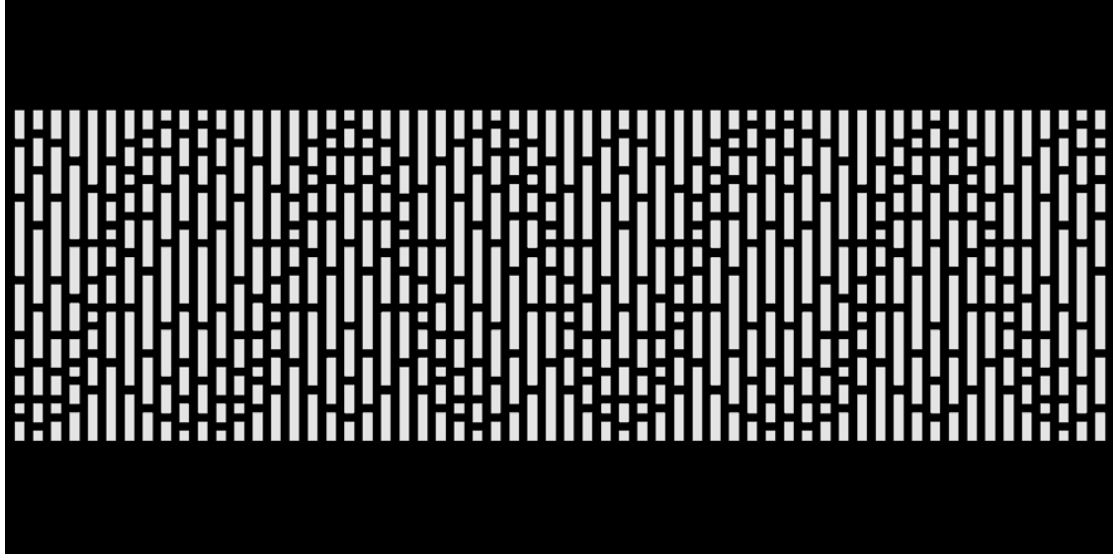


Figure 5. Fibonacci Strips

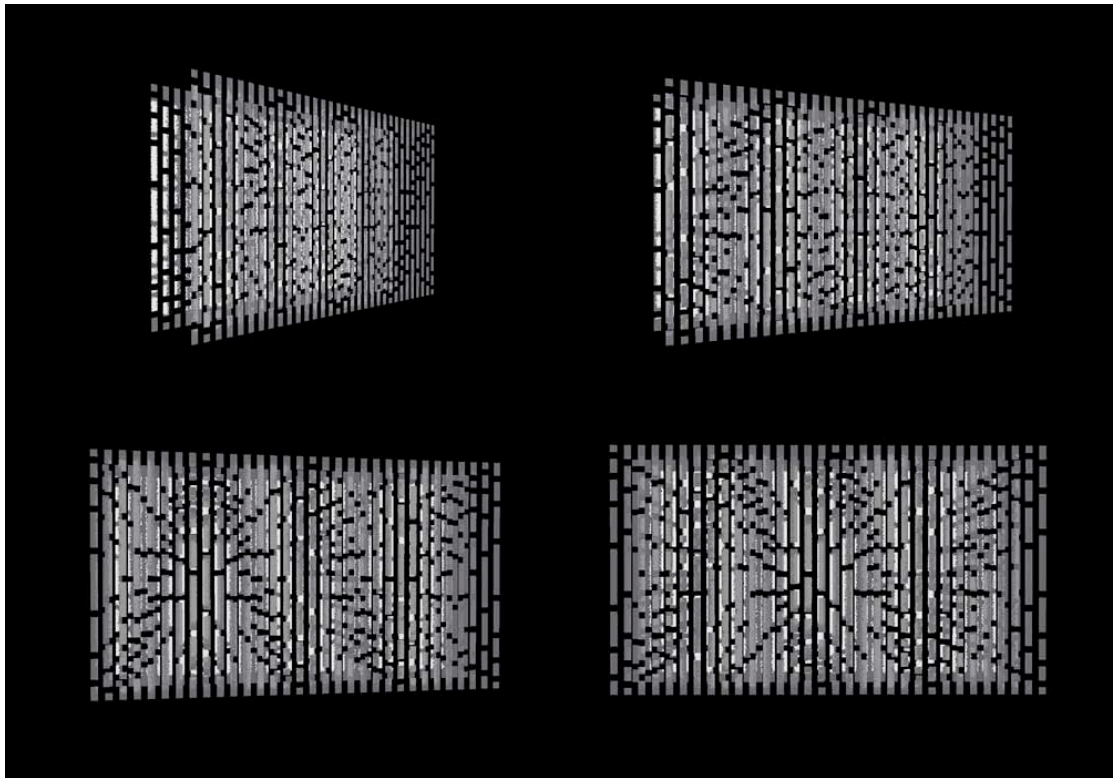


Figure 6. Optical Effects

## Prototyping

With the work I had been doing on optical syncopation in mind as an ideal response to the State of Design festival's themes, I approached Euroluce, a commercial lighting company, with a proposition for an optical light installation to be situated in the fourteen metre long prominent floor to ceiling glass display window shopfront of their Melbourne showroom. The original concept for the installation involved the precise arrangement of a field shimmering reflective strips, which would spell out Euroluce as a subtle visual illusion as one moved past the window. The design employed the principles of the Fibonacci series as vertical elements (developed in previous investigations) which were to be layered behind one another to create a compelling visual affect between the superimposed graphics. The work was conceived so that the movement of the viewer would expose an apparent movement within the graphics surfaces, a shifting immaterial illusion which rendered the design differently from every angle viewed. The piece was designed to entice pedestrians and commuters to engage in the perception of a dynamic, flickering and spiralling vision as they moved past the window. In doing so it sought to amplify the beauty of the transient and the ephemeral that can charge our urban spaces. The design encouraged the viewer to move in relation to the design and in doing so become more aware of the shifting light filled tapestry of the city's fabric.

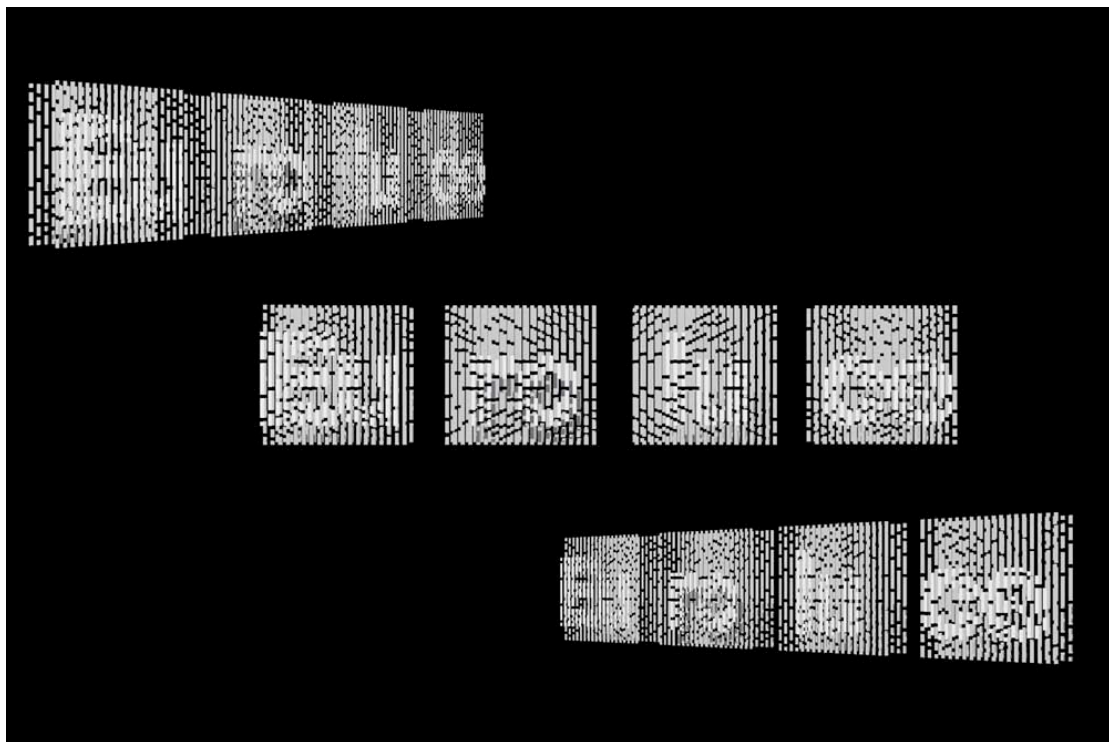


Figure 7. Euroluce Proposal



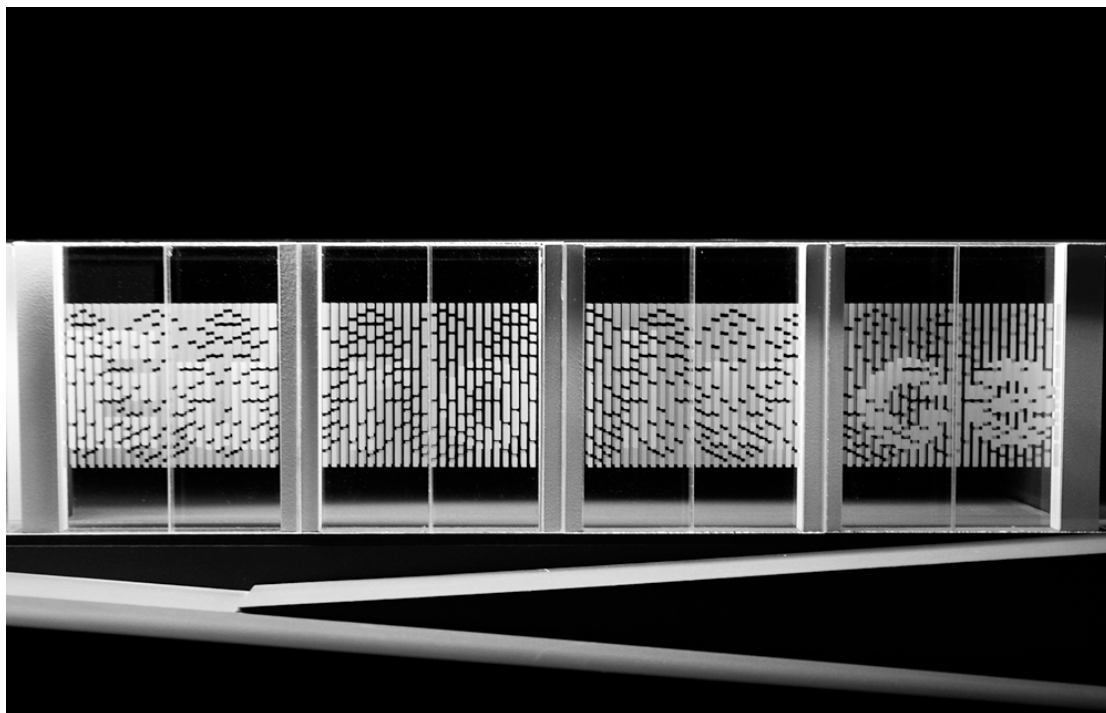


Figure 8. 1:20 Scale Model

The project was originally envisaged as being constructed from the layering of two sheets of acrylic between the columns that sat behind the showrooms glass façade. In each bay of the windows the Fibonacci strip pattern would be reproduced through the application of vinyl lettering on the large sheets of acrylic, while on the actual glass window an image of the Euroluce logo would be reproduced so that it aligned with the pattern of graphic strips behind it. This concept was developed in Rhino and Flamingo and a motion animation was made to see under what light conditions the flickering effect would perform best as one moved past the window. These ideas were then tested through the production of a 1:20 scale model of the entire showroom in which the qualities of the proposed vinyl lettering on glass and acrylic was reproduced through the laser etching of two millimetre acrylic sheet. Through these studies, an understanding of the parameters of the creation of the piece were refined and a sense of the variables at play upon the successful rendering of the visual affects was appreciated. However in the precise documentation and costing of the job it became apparent that to produce the work from large sheets of acrylic would be preventively expensive for a temporal installation and that other approaches would need to be developed to realise the project. Instead of producing the work from the use of vinyl lettering on sheets of acrylic, it was decided to investigate the possibility of creating a comparable affect through the use of suspended ping pong balls and alternatively with layers of black fibreglass flyscreen mesh. In order to test these two approaches full size prototypes of the capital letter 'E' of the Euroluce logo were produced.

The ping pong ball solution involved the redesign of the graphic strip pattern into an arrangement of suspended balls. As the original design was based on fifty millimetre strips and the ping pong balls were forty millimetres in diameter. The entire layout had to be reorganised and scaled to accommodate the difference in base unit size. The concept for the arrangement of the balls revolved around the threading of groups of them onto lengths of fishing line, which had a sinker attached to one end. The separation of individual groups of the balls to make the Fibonacci pattern was achieved through the use of jewellery crimps. Each line of balls was then terminated by crimping the end of the line around a small nail. The system for hanging the lines of balls involved the production of a top mounting panel that had three separate rows of holes laser cut into it. The mounting panel

would be first suspended from the ceiling using stainless steel cables and then the nails at the end of each line could be easily slipped into the holes and hung from the weight of the sinker at the other end. Through this system the balls were arranged in two background rows in which the Fibonacci pattern was reproduced and a front row which spelt out one of the letters of the Euroluce logo which aligned itself with the pattern of balls behind.

The flyscreen mesh solution worked in an almost opposite way to the ping pong balls. Rather than creating the Fibonacci pattern and letters from solid elements, the mesh piece was created by using the geometry of the original design and cutting it out of the sheets of flyscreen. In this way the patterns appeared as voids within the layers of mesh. The piece was produced by mounting the mesh to medium density fibreboard frames and used a template to cut out the Fibonacci patterns. Each individual frame was then stacked onto the other to create a layered density of mesh. In this arrangement, it was realised that the layers with the letter cut out of it needed to be at the back of the assembled frames, as the void spaces became more legible against the dark backdrop of multiple screens. Ultimately four layers of framed mesh were grouped inside a larger external frame that neatly unified the individual elements.

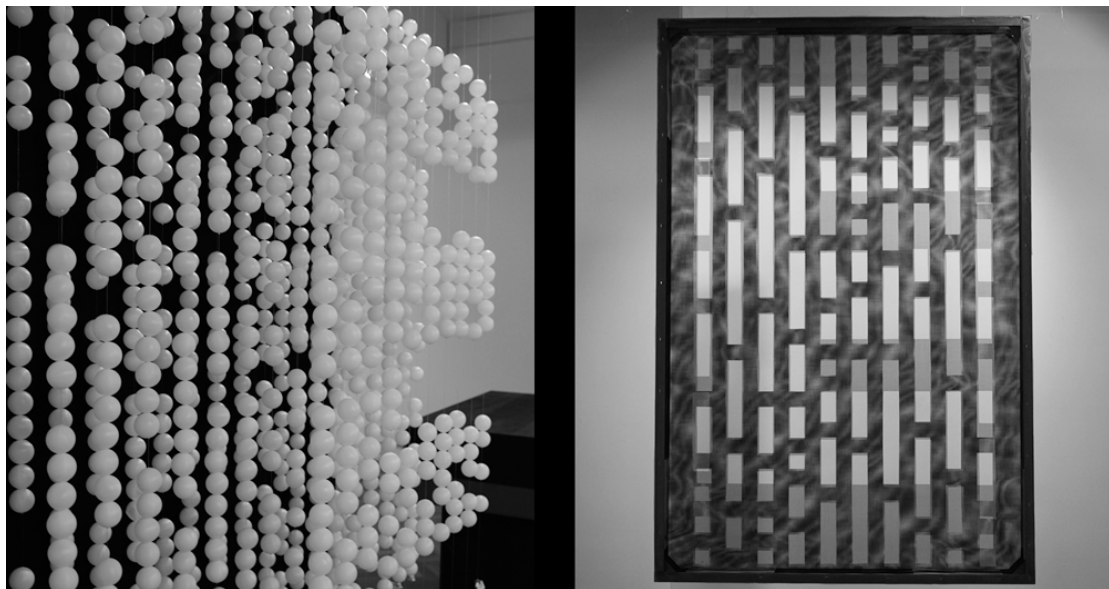


Figure 9. Ping Pong Ball and Wire Mesh Prototypes

### Positives and Negatives

With the prototypes completed, they were first taken to the RMIT School of Architecture and Design Gallery and hung for a day in order to test their properties in different spatial and lighting conditions, and to see the response of people to their affects. It was soon realised that the ping pong balls required a black background in order to make the spiral geometry visible and that the letters needed to be of a strong colour in order to differentiate themselves from the field of balls behind them. It was also noted that the ping pong ball piece would appear to be almost a solid element when viewed up close, while its optical affects worked best when seen from a distance. In contrast to the ping pong balls, the mesh piece needed to be hung a short distance away from a well lit white wall in order to manifest its full effect. In this situation the framed layers of flyscreen transformed into a nebulous glass-like surface which contained a swirling field of moire patterns that would alter in composition and intensity as one moved around and toward the piece. In the gallery setting the flyscreen piece caught the viewer's imagination. People were astounded at the optical properties of the piece and would be convinced it was glass even when they stood near it. The work had the ability to confound the viewer's perception even upon close

inspection. Many people were startled when they realised they could put their hand through the cut out voids in the apparently solid surface.

The overwhelming success of the flyscreen piece in the gallery setting came as a surprise, as up until then the ping pong ball piece was favoured as being the prototype that would be used for the final installation. It became apparent that both pieces would need to be tested in the window of Euroluce in different lighting conditions and with different backdrops. Once the pieces were transferred to the Euroluce showroom window, it was obvious that the preference for the ping pong balls for the final installation was the correct one. In the large brightly lit and highly reflective environment, the visual strength and physical presence of the balls came into their own, while the black mesh piece seemed to disappear. However when placed inside the controlled lighting of the showroom the mesh piece again manifest its extraordinary visual illusions. The decision was made to continue with the use of the ping pong balls for the fourteen-metre long window façade and to position the mesh piece within the showroom as an intriguing backdrop to the various imported designer light fittings. With these decisions in place I enlisted the assistance of a group of undergraduate students for what would become an intense three week production and installation phase of the project which would involve the use of over eight thousand ping pong balls, four thousand crimps and one and a half kilometres of fishing line.



Figure 10. Production and Setup

To achieve the optimal visual effects from the installation, the window façade display was precisely illuminated and the showrooms lighting collection was carefully composed against the showroom's black walls. In this way the installation, showroom space and lighting elements worked in a delicate harmony, in both the interior and exterior and during the day and night. Once the work was installed, I visited it regularly in order to reflect on its qualities and to gauge the reaction of the people who saw it. A number of interesting observations arose from the contemplation of the works characteristics. I became aware of its subtlety when considered as part of a busy urban environment. In the context of the bustling energy of peak hour traffic and the lighting and geometry of Federation Square and the Forum Theatre that are adjacent to the Euroluce showroom, the piece seemed to take on a restrained elegance. The stunning visual affects that were originally sought from the work when considered in the studio environment were transformed into a delicate embellishment of the peripheral perception of the streetscape. While the mesh piece inside the showroom shimmered with an intimate visual richness and immediate and confronting gestalt, the window work exposed its hidden layers in a gentle and allusive manner. Alternately glowing and dissolving in response to the outside world as it rushed past.



Figure 11. Installation Interior View



Figure 12. Installation Exterior View

## Liminal Conditions

The design methodology employed in the development of the *Transience of Light* was centred on the manipulation of the conditions that lie at the threshold of our perception and sought to bring these subtle secondary affects to the foreground within the conception of the work. The process of comprehending and producing such transcendent qualities in the installation evolved from the development of the concept of optical syncopation and the controlled manifestation of surfaces activated through their visual affects. While I appreciated the intensity and startling gestalts that the Fibonacci spirals and mesh screens generated and understood the immediate attention that they would attract within a gallery situation, I found myself more drawn to the potential subtleties of such affects and how these may be used in architectural contexts as sensorial constellations that we would encounter and appreciate everyday. This bringing to prominence of the physical stimuli that unconsciously shapes our perception defines the essence of the intention to design works that lie between field and form. In the *Transience of Light*, a delicate balance was pursued between these two extremes, as the installation would take on an apparent solidity when viewed from a stationary position in the interior of the showroom, yet would become more transparent and evanescent if one viewed the work, when in motion and from a distance.

The reconciliation of these two poles of perception was the territory that the 'transient materiality' series of works sought to investigate. The development of projects and their public presentation acted as a form of research into the nature of seeing and uncovered a range of responses within the viewing public. It was interesting to note, that the understated visual kinesis of the installation was not immediately apparent to many viewers, as the desire to perceive the piece as a physical three-dimensional object seemed to obscure the appreciation of the work's subtle optical affects. In considering this response to the work, I realised I had seen a similar reaction to perceptual artworks before, most notably in the Rothko room of the Tate Modern in London. In this situation the majority of visitors to the gallery would charge into the darkened space, read the written description of the work on the wall, give the paintings a cursory glance and quickly move on to the next room. While the actual experience of the work required the viewer to take their time, let their eyes adjust to the lower light levels and to allow the paintings to involve one's vision in the quiet oscillations and layered movements of the paintings' surfaces. In situations such as these, it appears that people are largely conditioned to perceive in certain ways and that the dominance of vision and the desire to differentiate objects in space can sometimes obfuscate our awareness of the subtle fields of phenomena that make up our perception of the physical world.

Ultimately the *Transience of Light* installation attempted to refocus the viewer's attention to the secondary gestalt-like affects of the physical world in a delicate and unheralded way. The success of the work lay in its ability to generate a compelling fascination that would draw the viewer in to appreciate the many layers of experience and perception that lay latent in the work. Rather than overwhelming the viewer with optical effects the installation succeeded in generating delight and wonder within the receptive members of the audience, who seemed to enjoy being in its presence, moving around relative to it and engaging in its immaterial physicality without being able to pinpoint the exact nature of its captivation. In this light the work reinforced an appreciation of the conception of the designer as a practitioner who orders the perception of spatial experience and suggested that there is the opportunity to re-imagine the act of design within the urban realm. Such a design methodology would seek to extend the parameters of urban architectural form and materiality so that a specific design can address the mobile nature of our occupation of the metropolis and in doing so encompasses the dimension of time within the envisioning of a particular work's affect upon the viewer. In this schema the city can be viewed as a

continuously transforming set of conditions which the designer modulates, amplifies and attunes in order to expose a dimension of responsive change within the fabric of the built environment and in doing so interweave the magic of the ephemeral within the structure of the enduring.

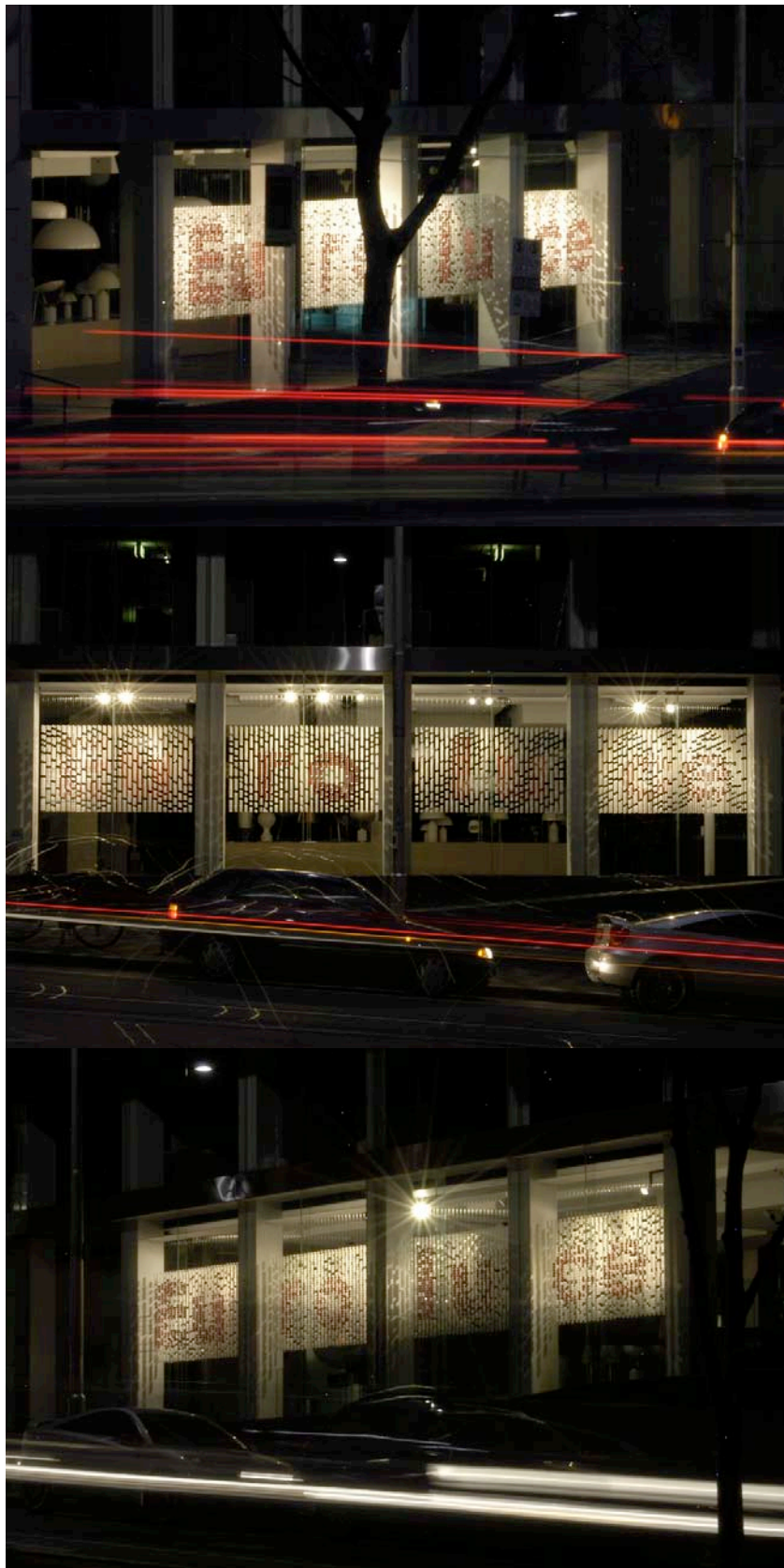


Figure 13. Installation's shifting dynamic when viewed in motion

## References

- New York City Department of Cultural Affairs. *James Carpenter: Inclined Light Wall*. <http://www.nyc.gov/html/dcla/html/panyc/jcarpenter.shtml>
- State of Design Festival: Design that Moves, 20 -31 July 2010. Retrieved from <http://www.stateofdesign.com.au/Festival/Festival-Theme>
- Yiu, M. (2003). *Virtually Transparent Structures*. *Post Modern Culture*. Cornell University Volume 13, (Number 3). Retrieved from <http://www3.iath.virginia.edu/pmc/issue.503/13.3yiu.html>
- Yontef, G. (1993). *Awareness, Dialogue and Process: Essays on Gestalt Therapy*. Gouldsboro, ME: The Gestalt Journal Press.

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Ross McLeod has spent the last twenty years engaged in a practice that traverses the nexus between art and design. The central premise of this studio based research eschews the conception of materiality and physical form as the central concern in the fashioning of objects and spaces, and embraces the comprehension of the physical fields that shape sensorial experience as its primary concern. The introduction of these perceptions into the site specific nature of the urban realm provides the opportunity to expose the many layers of interpretation, contextual reference and potential metaphors inherent within the shaping of the sensorial qualities of space. In such a practice the essential design act is no longer viewed as being concerned solely with the conceiving of the structure of the built environment but rather is involved in the shaping of spatial experience. To this end the practice engages in producing, curating, exhibiting, documenting and publishing works that extend the boundaries of contemporary design practice and the sensibilities that surround it.

Transient Materiality