CONSCIOUSNESS REFRAMED

'EXPERIENCING DESIGN - BEHAVING MEDIA'

Title: Virtual sites – performance and materialization

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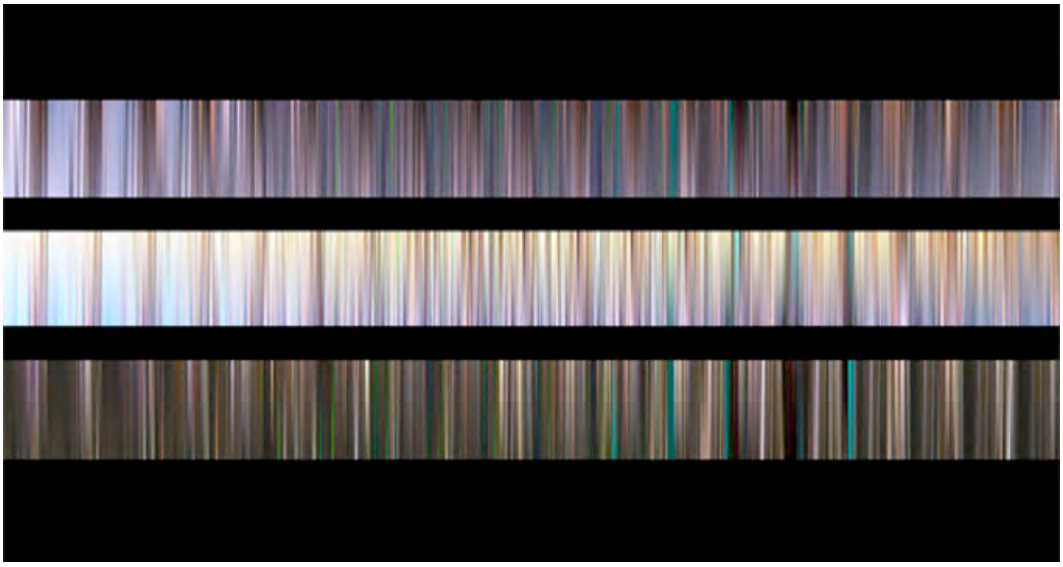
ABSTRACT

The imagistic promotion of iconic city form is increasingly achieved by the deployment of the CCTV webcam system. This not only presents new material to mediate people's engagement with this space, but also offers new ways to materialize its actual three-dimensional form.

Recent design-based research conducted at the University of Technology, Sydney, shows that the function of CCTV Internet camera can be extended and adapted to provide a type of engagement with urban environments that subverts its more representational role and converts it into one that is qualitative and experiential. The paper will discuss how the performative aspects offered by this virtual environment can be productively employed by the Internet user to create not only a new type of engagement with public space, but also, ultimately, to curate this space.

The paper will also reveal how the strategic deployment of recently developed non-proprietary softwares can be used to intervene within the operational logic of the Internet camera to exploit its potential for use as a design tool. By the strategic recruitment of these softwares, raw virtual qualitative data from webcam images is processed to generate a formal response to civic space. This type of intervention, which utilizes the two-dimensional image as a platform for intervention within three-dimensional space, asks the designer to relinquish the techniques traditionally used to generate urban form and instead to capitalize upon the opportunities for material intervention offered by the spatial ambiguity of virtual and real-time environments. The exploration of the distortional optical properties associated with contemporary camera technology begins to suggest the development of a range of new techniques for design intervention which will continue to evolve in direct relationship to the technology they exploit.

The paper, therefore, will discuss how the utilization of the interactive potential of the CCTV system can produce a new understanding of urban space that replaces any symbolic role for form with the affect of form. This range of unprecedented techniques can be seen to offer a new paradigm for material intervention within both 'virtual' and urban space.



Urban colour profile of webcam view Sydney Harbour Foreshore generated using non-proprietary medical imaging software: ImageJ.

1 Introduction

One aspect of the articulation of our relationship to landscape is the establishment of conditions relating to its inhabitation. The representation of these conditions in turn establishes a relational field between the viewer and the object, which is determined and controlled by the distribution of power and ownership. If the visual paradigm that contextualizes images is fundamentally political in nature, then the technologies that effect its transmission are subject to the transience of political regimes and the cultural shifts that accompany them. This suggests the development of techniques for the adaptation of these mechanisms into new roles that might subvert or capitalize upon the original political aspect of their function to transform this relational field, and thus the nature of our experience and occupation of urban environments.

The permeation of digital systems throughout contemporary space is typified by the CCTV webcam system. Their configuration into networks that imagistically promote iconic city form can be regarded as a strategy employed by controlling authorities to curate the visual experience of the contemporary urban landscape as a projection of their personal social and political interests.

Design-oriented research recently conducted at the UTS shows that the webcam's conversion of the real into the virtual is able to provide viewers with a facility to adapt and mediate their experience, subverting the original surveillant role of these systems and converting it into one that is both qualitative and experiential. However, more importantly, this digital conversion is able to offer the designer new ways to materialize three-dimensional form.

The paper therefore, will discuss how the appropriation and manipulation of open-source digital softwares in combination with camera protocols can lead to the formation of a range of techniques which can be assembled selectively according to specific design palette requirements for material intervention within both 'virtual' and urban space. Moreover, it will also discuss how the strategic manipulation of camera technology can lead to techniques that have a material effect upon urban form: one that derives not from a response to signification, but from the synthesis of the body and the digital image, from one of affect.

2 CCTV Systems - From Surveillance to Materialization and Affect

In his book *Art and Technology in the Nineteenth and Twentieth Centuries,* prominent historian and art critic, Pierre Francastel argues that the imaging of environment is one way of attempting to understand our relationship to it: that representation not only allows us to deal projectively with our environmental context but also to modify it[1]. The extension of Francastel's argument is that adjustments made within the technology and performance of imaging mechanisms will ultimately influence both the nature of our occupation and its translation into material form.

In *New Philosophy for New Media*, Mark Hansen discusses the notion that it is a new and unquantifiable type of engagement with technology: the computer, that contextualizes contemporary living. As the modern medium for the generation and transmission of the image, the computer allows us, as Francastel would also argue, to understand and to modify our environment.

'It is the imperative to discover and make experienceable new forms of embodied perception that capitalize on the perceptual flexibility brought out in us through our coupling with the computer.' [2]

However, the production of the image and its transmission within contemporary urban environments is achieved by a range of digital systems, which also demonstrate and uphold specific relationships between power and landscape. One of these, the CCTV system, is a device used by governing authorities to police illicit activities because the spatial complexity of the contemporary city cannot be viewed from a single vantage point. While the primary mechanism of these systems is social surveillance, their controlling effect far exceeds this aim.

In 2007 a project developed in the *InfoCity - CityInfo* studio, run at the University of Technology Sydney by Gavin Perin and Joanne Jakovich, revealed that authorities strategically site CCTV cameras as imagistic purveyors of significant city sights. These pervasive digital systems, in their most voyeuristic and passive form as a new privileged vantage point for the 'remote' tourist to view the city, allow authorities to curate the visual experience of the contemporary urban landscape.

The studio's aim was to investigate how urban interventions could be developed through the collection and translation of data sets by means of digital tools. In light of this, one aspect of the investigation led to the development of a methodology whereby non-proprietary medical imaging software, ImageJ,[3] was adapted to extract and assimilate the qualitative colour rendering properties of different urban spaces as seen through these promotional webcam systems. As a result of the colour sampling of three cities, London, Paris and New York, it was demonstrated that each city possessed different profiles. With this realisation it was decided to extend the research into a proposal for a new urban intervention into Sydney's Circular Quay precinct.

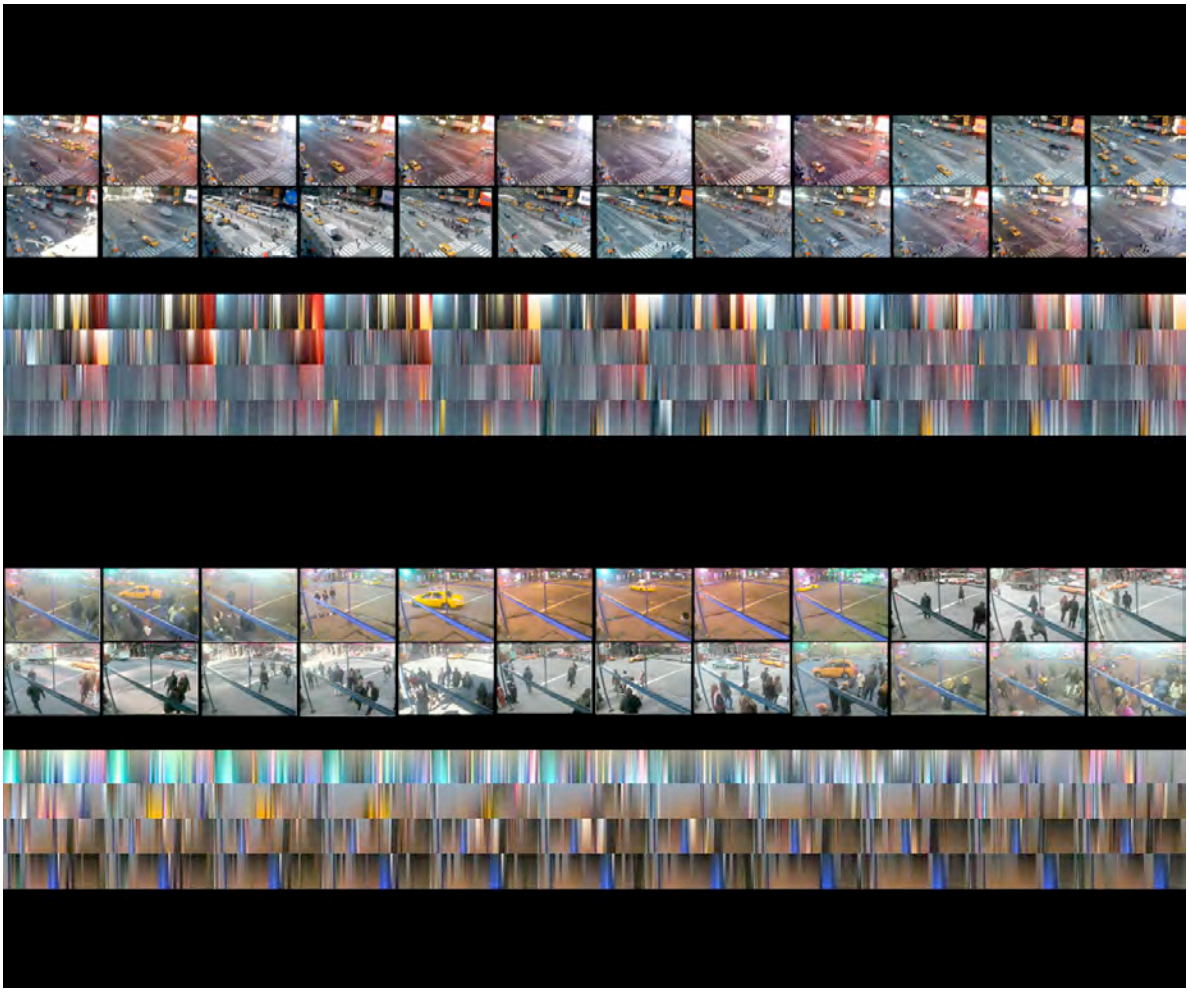


Figure 1: Captured webcam images and ImageJ colour profiles of New York

3 New Techniques of Materialization

3.1 Colour and Spatial Delineation

One distinguishing condition that this site offered was the urban development by-law that attempted to regularize form and control any addition to this context. Theoretically this would avoid any direct challenge to the iconic status of the Sydney Opera House. For this reason the decision was made to test an intervention that worked to challenge this condition in two ways: the first test attempted to recalibrate the colour rendering profile of the entire site by recording the colour profile of all new interventions: the aim was to use the ImageJ software to test a range of interventions that would disrupt the existing colour profile.

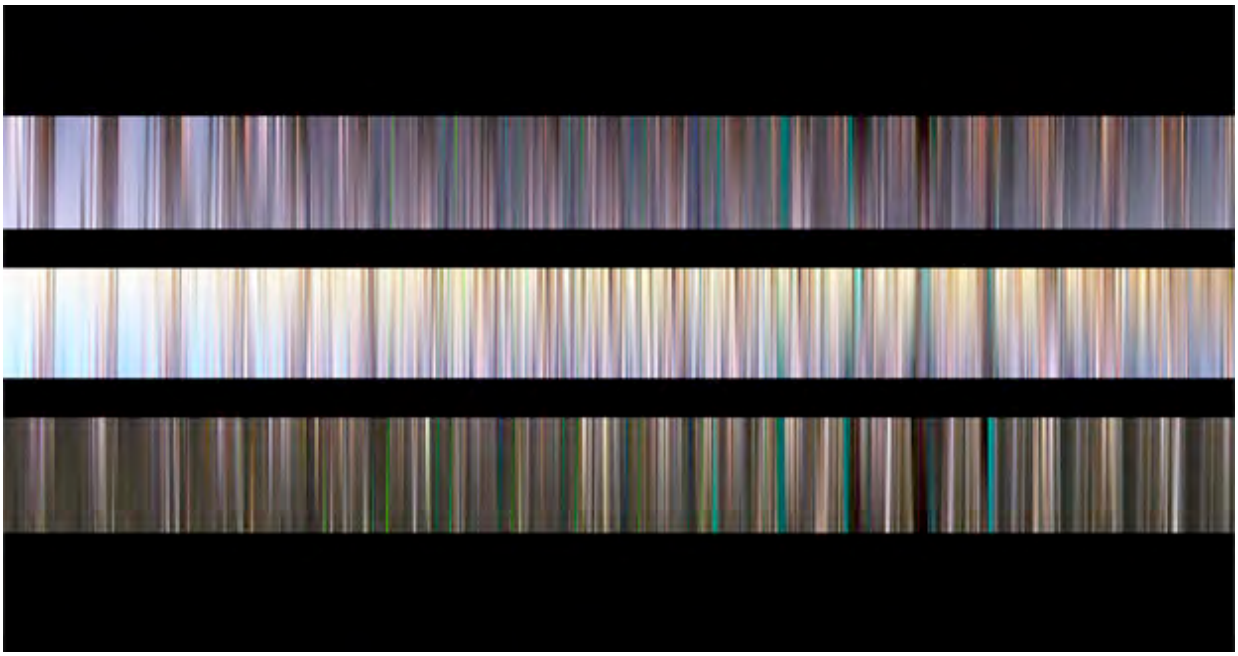


Figure 2: ImageJ colour profile of Sydney Harbour Foreshore showing interventions in green

The second test would capitalize upon the optical aberrations that might evolve through the interaction between the structure of the virtual image and its production via technical protocols within the camera. To this end, the definition of the built interventions into the Circular Quay Foreshore site was spatialized by placing a linear grid over the 'flat' CCTV image. Since the flat virtual image is composed of a series of information pixels, all equal in size, any design element applied at a uniform scale to this image would manifest at different scales in its real-time physical counterpart. The site was subdivided from the image's mid point to remove any hierarchy inherent within the view.

Figure 3: Webcam view with grid

The placement of the grid over the image did not provide any further detail beyond an abstract spatial delineation so, accordingly, a pattern was applied to the grid: in this case the Münsterberg pattern.

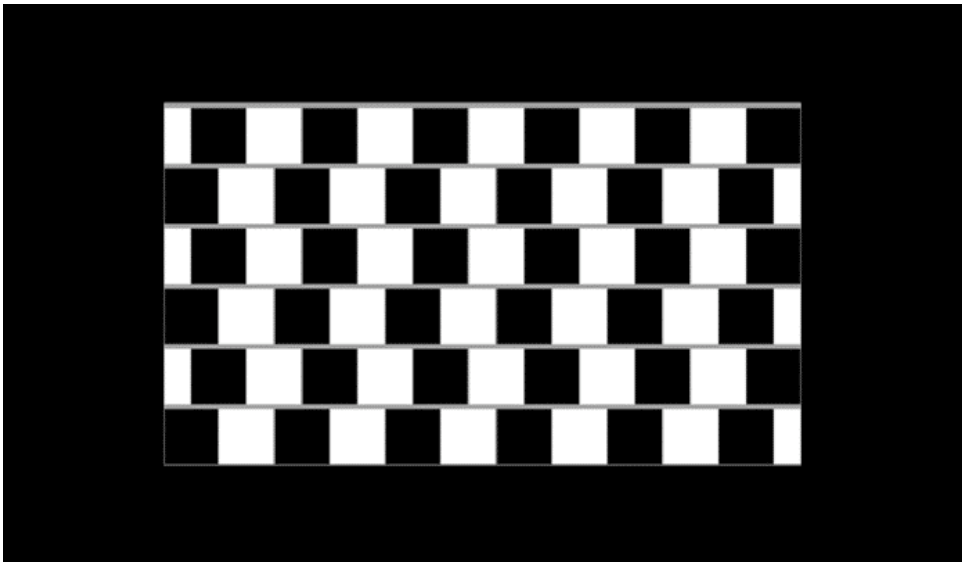


Figure 4: The Münsterberg pattern

This type of patterning device is optically unstable, both in terms of camera resolution and as an optical illusion effect. In the case of the Circular Quay Project, this was achieved by scaling the units of each façade component to match variations within the camera's depth of field, the effect being that the façade would constantly shift in and out of focus as the camera's zoom facility was operated. This destabilizing effect was further enhanced by the production of a panelling system whereby alternating areas of solid black and transparent sections would be assembled to allow light to bleed around the edges and to visually blur the image. The distribution of this patterning is deceptive because there is a vast

discrepancy between its impact on the virtual and real-time views: the density of the pattern when distributed across vertical and horizontal elements is far less evident in a real-time context when one physically moves around the space.

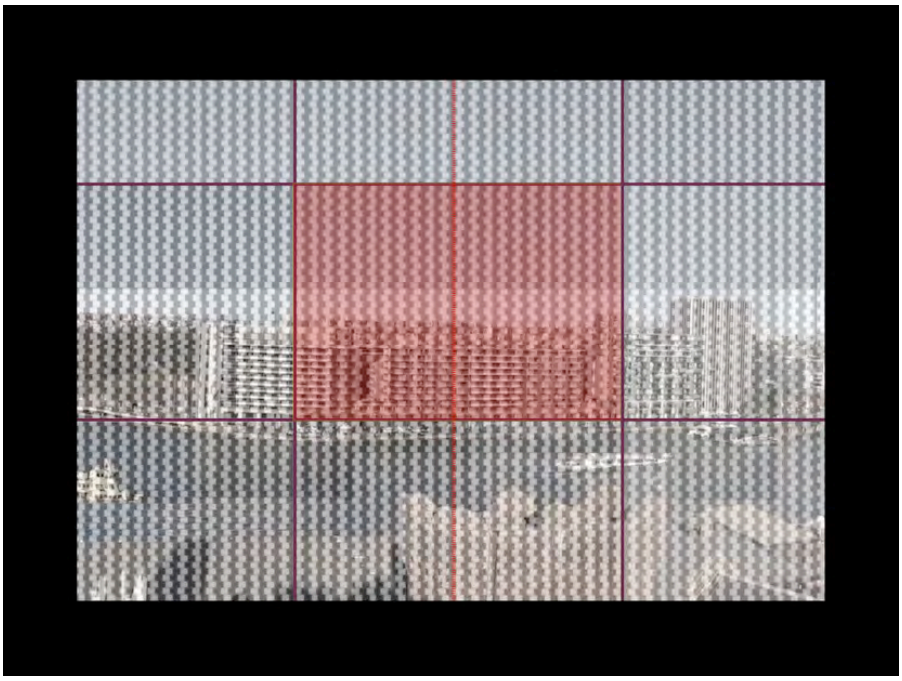


Figure 5: Webcam view with grid and Münsterberg pattern overlay showing area of site selected for intervention

In this way, the project's use of the anamorphic projection of the Münsterberg pattern is as visually disruptive to the virtual as it is to the real tourist. The visual strategies deployed within the Circular Quay project can be understood as a subversive disruption of both real and virtual space, which not only acts to deliberately challenge the governmental by-laws but also challenges the promotional agency of the webcam system itself.

3.2 Scale, Materiality and Camera Technology

The distribution of the two-dimensional Münsterberg pattern across the three-dimensional space of the image was also used projectively as a device for determining different programmatic configurations while remaining within the conceptual framework of the RGB digital environment.

Within this environment, the scale of each tile varied across the site depending on its real three-dimensional spatial location. At a mid-range scale [approximating to the middle of the depth of field of the camera], the pattern produced a 400mm square façade element that could, as one zoomed out to a smaller scale and greater depth of field, be rescaled to determine floor and wall division.

At a larger or closer scale, program could be subdivided according to the proportions inherent within this additive colour system. In this system, the proportions of the RGB colour ratio within each individual pixel were used to conceptually determine program subdivisions. The distribution of these proportions was reconfigured to accommodate required program.

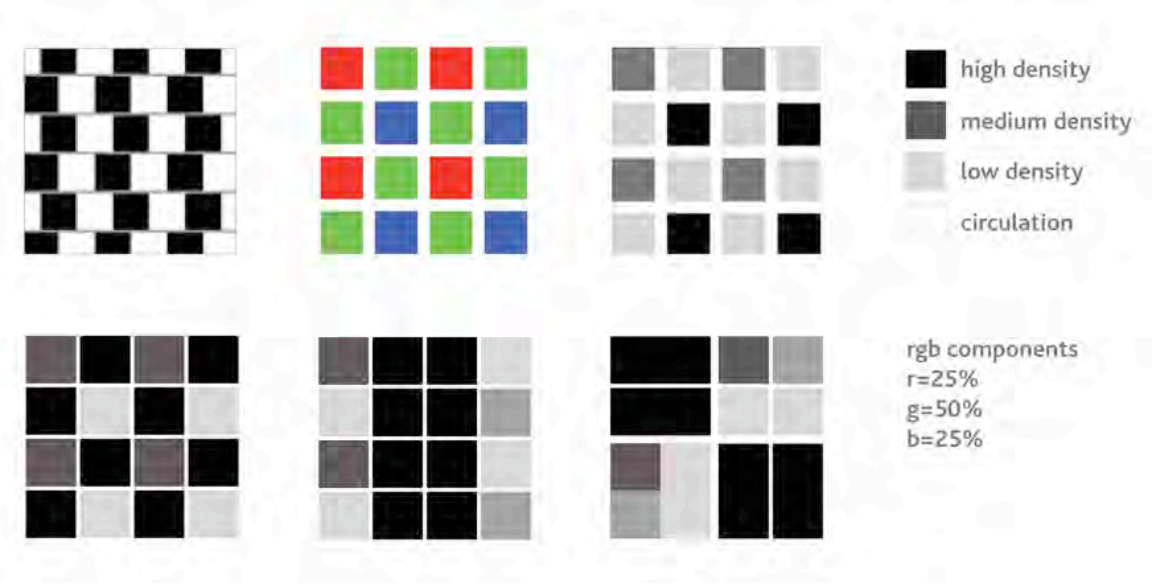


Figure 6: Individual program breakdown based on pixel colour ratios

In this way the entire façade was assembled to create the pattern by grouping activity that emitted similar levels of luminance, so that the activity of program would drive the visibility of the interior spaces and ultimately resolve the materiality of the façade.

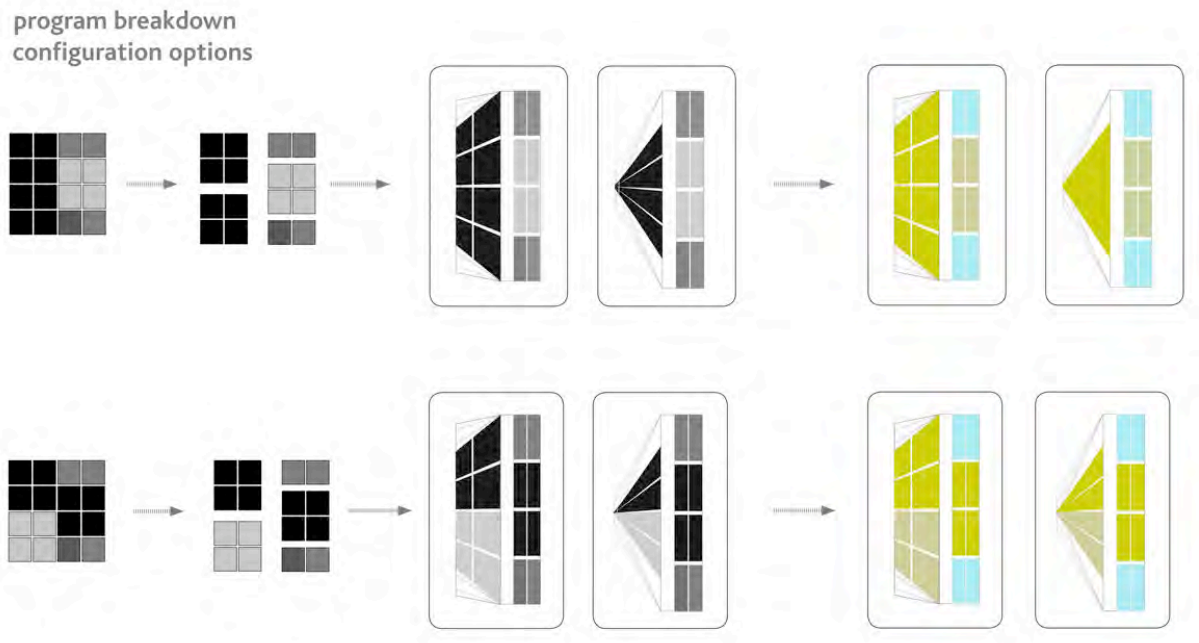


Figure 7: Primary and secondary program breakdown configuration option based on RGB pixel colour ratios

3.3 Diffraction patterns

A further exploration of the camera lens mechanism also revealed its potential to exploit the discrepancy between the virtual and the real-time views of the site by utilizing the diffraction patterns produced by the incidence of the luminance of the image upon the camera lens. By incorporating design features within façade interventions that duplicate one or more of these patterns the visibility and prominence of the

resulting image could be manipulated accordingly. This ‘deceiving’ of the camera lens, in combination with the recently developed capacity of the viewer to manipulate the camera’s depth of field, would result not only in a disruption of the intended ‘iconic view’ of the site, but, more importantly, it would be vastly different from its real-time counterpart.

Consequently, within the Circular Quay Project, open-source scientific software Fresnel Diffraction Explorer[4] was used to generate a number of Fraunhofer patterns based upon the captured image of the site over a range of different lens apertures. The broad range of dramatic results suggests the capacity for the incorporation of these patterns into the materiality of façade interventions thereby enhancing the performative aspect of the space of this virtual environment.

However, while the logic of this process is provable within a scientific context, the optical effects of the incorporation of these patterns within the received image are currently being tested and can only be considered to be speculative at this stage.

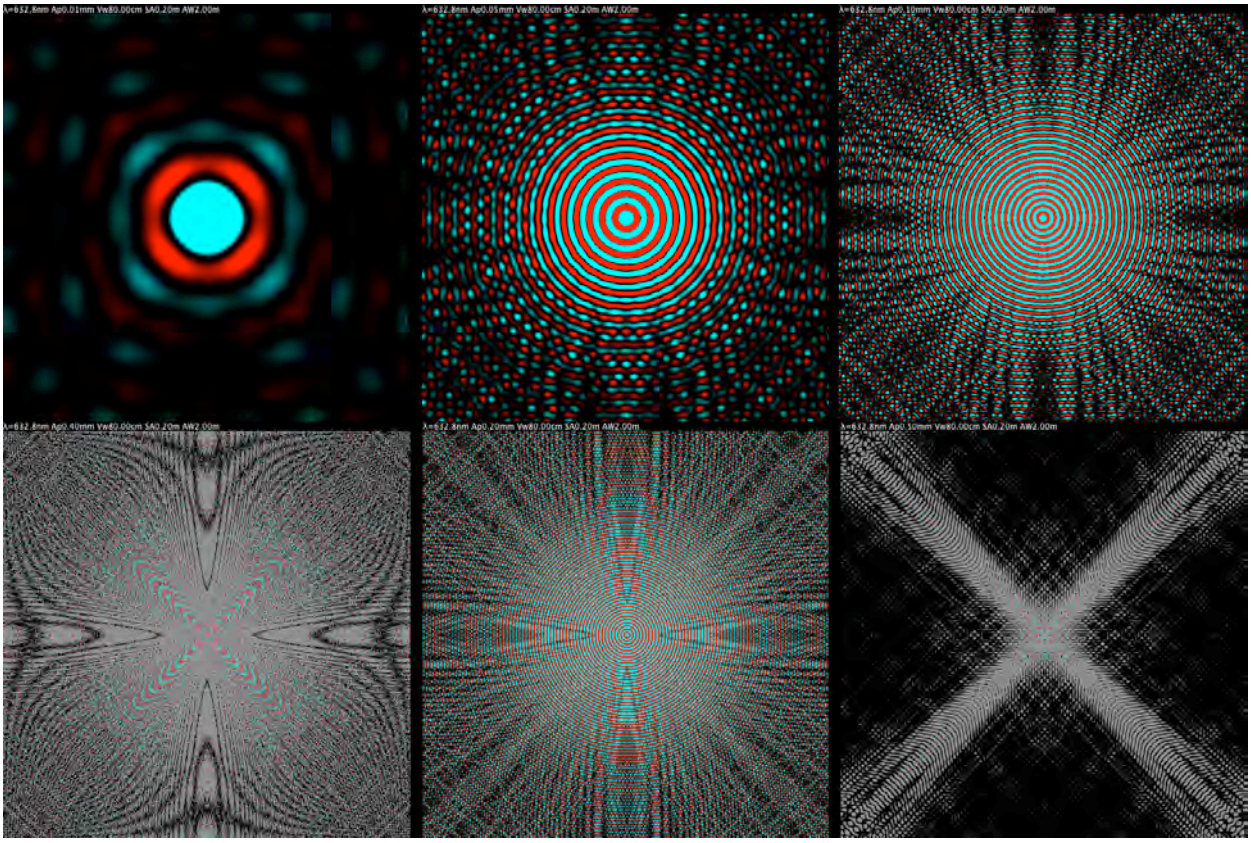


Figure 8: Fresnel Diffraction Explorer diffraction patterns of webcam view ranging from narrow lens apertures [top left] through to wide lens apertures [bottom right]

3.4 Pattern and program

In the Circular Quay Project the Münsterberg pattern was co-opted to generate form by using it to produce a displacement field created in the 3D modelling program, Rhinoceros. As the integrity of the pattern can only be achieved when it is flat to the camera, this formal translation had to be modified in accordance with the orientation of each site to the webcam. In order to retain maximum legibility, the building form was twisted to achieve a flat reading of its façade perpendicular to the camera lens.

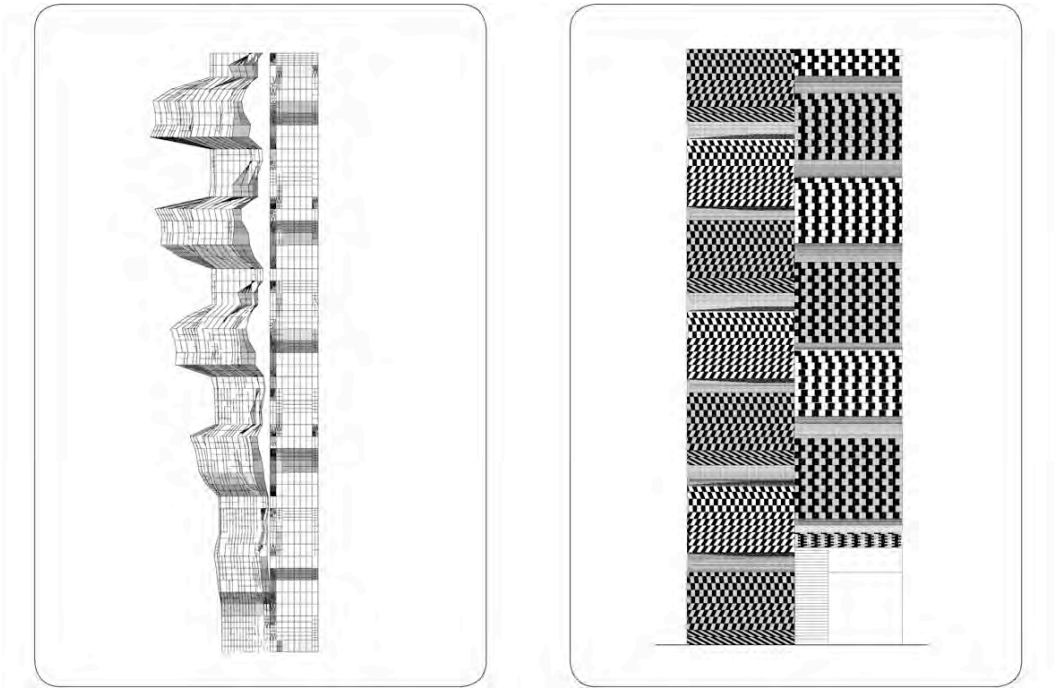


Figure 9: Left: twisting of façade generated in Rhinoceros
Right: façade showing application of pattern

This twisting inevitably had profound implications for program and in the most acute case; the karaoke club at No. 7 East Circular Quay, the western section of the façade was morphed to the north. This twisting action, taking place along the entire vertical axis of the building, established a relationship with pattern and colour that enabled a further projective indication of programmatic location. In this case there was a direct relationship between the amount of twisting and degree of public-ness of the space: the greater the twisting, the more intimate the space. Accordingly the primary program was located on the floors subjected to less twisting, while the secondary program was located on the more distorted floor plates.

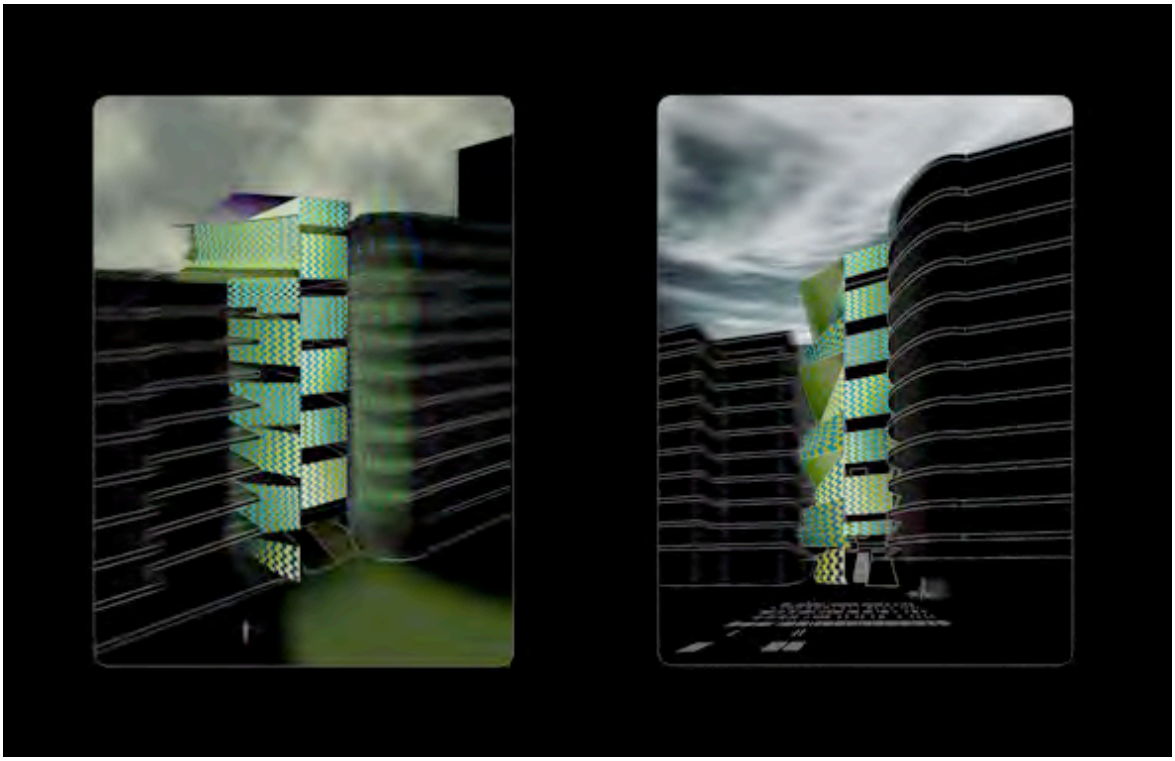


Figure 10: Left: webcam view of karaoke club at #7 East Circular Quay
Right: street view of karaoke club at #7 East Circular Quay

However, the determination of program location at No. 1 East Circular Quay was vastly different because the proposed façade was practically perpendicular to the camera frame. The straight application of the pattern nevertheless belied a large discrepancy between the camera view and the street view. To the camera the façade was perfectly flat, whereas at ground level it sat well forward of its neighbours and extruded, at the upper levels, over the existing walkway.

The experimental theatre performance space, acting as a counterpoint to the Opera House, involved the integration of various media presences. This program required a disruption of the pattern's scale to facilitate the theatre brief. The auditoria, as a primary program component, necessitated a doubling up of the pattern to achieve an appropriate façade response. The result of the interruption to pattern meant that void areas were opened up to allow other design opportunities, such as outdoor entertainment areas, to be inserted.

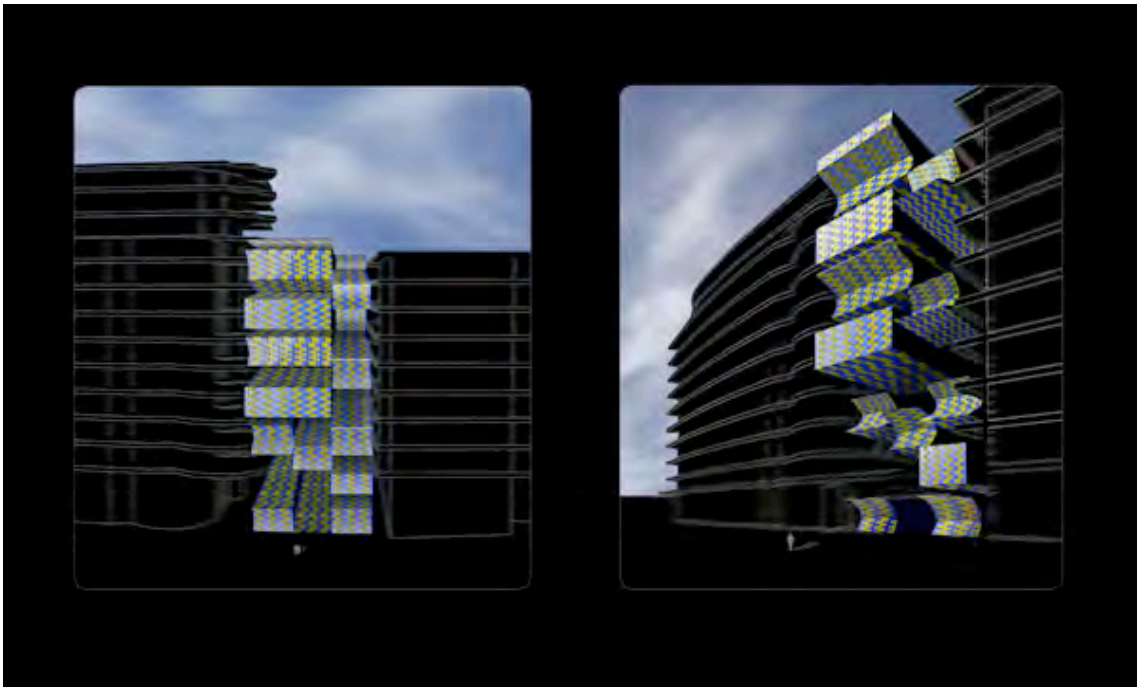


Figure 11: Left: webcam view of experimental theatre at #1 East Circular Quay
Right: street view of experimental theatre at #1 East Circular

4 Conclusion

This design-orientated research begins to show how the how the virtual can provoke a technical springboard from which to establish an intervention that departs significantly from traditional urban design methods. By asking the designer to relinquish traditional design strategies this research shows how the strategic manipulation of camera technology can lead to the establishment of a range of techniques for the materialization of urban form that productively exploit the discrepancies between the virtual image and its real-time counterpart. Moreover, it also reveals how the transformation of the role of CCTV from surveillance to the imagistic promotion of the city creates an operational platform which demands a vastly different style of public engagement with urban form: one that derives not from a response to signification, but from the synthesis of the body and the digital image, from one of affect.

5 Bibliography

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(2,483 words including notes and references)

1 Pierre Francastel, Art and Technology in the Nineteenth and Twentieth Centuries (New York: Zone Books, 2000), 25.

2 M. B. N. Hansen, *New Philosophy for New Media* (Cambridge, Massachusetts: MIT Press, 2004), 108.

3 http://rsbweb.nih.gov/ij/.

4 http://daugerresearch.com/fresnel/index.shtml.