DIGITIZED BODIES AND THE CRISIS OF THE ARCHITECTURAL DRAWING

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INTRODUCTION
The representation of an architectural object comes into being by working at it from a distance. Robin Evans states: ‘I was soon struck by what seemed at the time the peculiar disadvantage under which architects labour, never working directly with the object of their thought, always working at it through some intervening medium’. As such, the architectural drawing functions as an intermediate that translates ‘an object of thought’ into a building. These projective drawing media are based on established geometrical principles. Thus the ‘object of thought’ is to a certain degree, informed by certain rules. Yet the geometrical determinism implicit in drawing media is somehow, according to Evans, countered by imagination. Through imagination it becomes possible to unhinge the drawing’s geometrical determinations. Evans asserts this when he says ‘more in accord with our prejudice that architects of genius must wrest themselves free from the restriction of geometrical drawing rather than use it’. 

But what in-forms an imagination of a certain space in the first place? In this case, is the architect’s imagination of space already not inhibited by projective geometry? Before thinking of the intentional act implicit in translating drawing to building, what produces the ‘image of space’? And to what extent is this ‘image of space’ geometrically determined? While these nebulous questions might imply a search towards origins, what will be considered here is how the digital re-articulates these issues. This article attempts to probe the questioning of the architectural drawing through a digital multi-media installation of my own making entitled the diplorasis. Through this media installation the participating body becomes entwined with space. The distance assumed between body and object in this case ceases to exist. This particular media experience will offer a means from which to re-think media constellations by re-visiting the work of Marshall McLuhan, and Gilles Deleuze and Felix Guattari. The latter part of the paper investigates the medium that is central to the diplorasis, i.e. stereoscopy, and considers its more recent analog to digital transition in more detail. By looking at the digitized stereoscope through Deleuze and Guattari’s notions of smooth and striated space it becomes possible to speculate on possible tangents where it is no longer the drawing that intermediates between ‘an object of thought’ and a building, but rather it is the body that is positioned at the interval between actual space and virtual image. If the body in drawing projection as articulated by Evans implies forms of distancing through geometrical projection and experience, then how do we account for the contemporary body that is open to technological manipulations of distancing and proximity?

A MEDIATED SPACE
I would like to begin unfolding this line of enquiry through a media installation project of my own making entitled the diplorasis – the word derives from the Greek compound terms: diplo –double and orasi- seeing. The diplorasis started in 2014 as an installation, a kind of a hyper-mediated walk-in
‘corridor’, in an abandoned house in Nicosia, Cyprus. The external structure of this ‘corridor’ holds up 140 mirror panels made from either acrylic or glass each measuring about 60 x 40cm. Eight of these panels are one-way mirrors (stop sol). The frame also holds up a sandblasted glass piece (120 x 120cm) with a hole that supports a rectangular cavity in the form of a human head. Excluding the curtain entrance and the translucent glass panel at the far end, the inside of the corridor is composed entirely of mirrors. The outer shell of the corridor – the exposed timber frame - contains various cameras and electronic wires. The juncture between the outside and the inside is negotiated via one-way mirrors.

When one enters the brightly lit corridor, the viewer, or more appropriately the ‘participant’, will be drawn towards the sandblasted translucent screen at the far end of the corridor with a cavity in the shape of a human head and two peepholes. As the participant walks through the space, the lighting condition changes frequently in response to changes in the movement, which creates further disorientation in the infinitely-mirrored space. Inducing a difficulty in grasping the entire volume. This is also due to the fact that black (or one-way) mirrors are not positioned in any clear order and there is a slight split in the main volume of the corridor that is not obviously perceptible. This split occurs about two thirds of the way inside the corridor where the height of the ceiling is lower. This has a strong effect on the perception of the mirrored corridor, as the floor appears to be suddenly receding, whereas in reality it is constant. When finally arriving at the far end of the corridor, the participant will be drawn to position his/ her head inside the cavity. Through the peepholes s/he will encounter a stereoscopic projection of themselves from previous instances inside the corridor space. These stereoscopic images will then be sequentially replaced a few seconds later with another view of the participant. As images change, they become increasingly misaligned and manipulated, making the participant suddenly self-conscious of their own movement from unexpected angels (from sides, from behind), but also the movement in time in the duration of the walk along the entire corridor (spaces beside and behind).

Behind the scene various Raspberry Pis are connected to Arduino micro-controllers, DSLR cameras, LCD screens. The arduino micro-controller is in turn connected to programmable LED strips and ultrasonic sensors. Software programs control Pis and Arduinos and their communication in capturing the participant’s movements at various intervals (approximately every metre). These sensors when triggered activates in both the LED light strip and the camera to capture an image of the participant. These instantaneous stereoscopic images of the moving participant are achieved by custom made stereoscopic mirrored caps placed in front of cameras. The lighting condition needs to be very specific in order for this capture to work (i.e. for the lens to have sufficient light that would enable a sharp image captured through a quick shutter release). At the same time the lighting further disorients the participant’s comprehension of a spatial coherency. These cameras are placed behind one-way mirrors and within blacked out (via felt) volumes to maintain the lighting ratio necessary for a one-way mirror to work, i.e. dark on one side and very bright on the other. Hidden from the view of the participant, these cameras rely on a sudden flashing of light to capture a sharp and stereoscopic image of the participant, which then is processed and split by the software. The split pair of images is then sent to the two LCD screens via a wifi router connection. Four LCD screens are placed on a rotating base. Once a stereoscopic pair is projected on one screen, the image remains for a number of seconds, then the base rotates to show the next screen with the next pair, and so on, until all images are projected. Some of the pairs are not photographic stills but a pair of very short videos. During this rotation, the actual environment of this machinic setup is also visible. Mirrors placed between screens will re-project the view of the participant while looking. Finally, some of these projected images are
Manipulated through the software by being warped. Currently the possibility of integrating and transforming some of these images into a point cloud format is being explored.

MEDIA AND BODY
In the diplorasis it becomes pertinent to ask how does the sensing body relate to its dissonant projected image? In Understanding Media (1964), McLuhan unravels how media continuously alter man’s sensory fields. Along with the altered sensory field is the altered sensory body. For McLuhan, each medium entails a particular sensory involvement with the body. Media affect the proportionate investment of each sense – thus each medium assumes a different sensory investment. The medium of the television (referring to the cathode ray tube television screen) for example is described as ‘a mosaic of light and dark spots which a movie shot never is’. Therefore the ‘TV image requires each instant that we “close” the spaces in the mesh by a convulsive sensuous participation that is profoundly kinetic and tactile, because tactility is the interplay of the senses, rather than the isolated contact of skin and object’. Furthermore, the intertwining of different media produces new assemblages that lead to novel media, as McLuhan states: ‘... the meeting of two media is a moment of truth and revelation from which new form is born’. New media and the emergence of new form continue to incorporate remnants of old media, through habits and technological conservation. McLuhan points out that ‘although the medium is the message, the controls go beyond programming. The restraints are always directed to the “content,” which is always another medium’. In one of his references to Euclidean geometry McLuhan presciently indicates how the introduction of informational loops offers a possible means for thinking beyond Euclidean notions of space. The distinction he makes is between the ‘automatic’ that ‘involves feedback’ as opposed to the ‘one-way flow or mechanical system’. As the ‘feedback or dialogue between the mechanism and its environment brings a further weaving of individual machines’, the lineality assumed by Euclidean space is challenged by informational circuitry. The relation between body and world assumes a different sensory investment in a geometrical system – i.e. Euclidean space- then it does when compared to informational systems (although these are not necessarily distinct). If informational processes are increasingly re-scripting our sensory co-ordinates why is the design of space still so reliant on geometrical determinations? Does the distance assumed by Evans in the translation from drawing to building still hold in the digital era? In order to further explore these questions the articulation of smooth and striated spaces by Deleuze and Guattari offer a possible method from which to re-consider informational media and their relation to the body. Deleuze and Guattari in A Thousand Plateaus refer to the notions of smooth and striated space. The smooth and the striated involve different types of multiplicities. Striated space is identified with metrical space (from the Greek word metro: translated as to count or unit). Metrical space measures and codifies. An example of this is the ‘the magnitude of a vertical line between two points’ that ‘can be compared to the magnitude of a horizontal line between two other points: it is clear that the multiplicity in this case is metric’. This type of magnitude ‘allows itself to be striated’ and its determinations are magnitudes’. Smooth space however involves a resistance to striation. These magnitudes ‘cannot divide without changing in nature each time’. This division corresponds to an extensive and intensive magnitude, already articulated by Deleuze in Bergsonism. The two types of spaces: the one extensive and quantifiable, and the other intensive, qualitative and temporal are intertwined when related to matter. Smooth and striated thus ‘give rise to far more difficult complications, alternations and superpositions’ and ‘nothing completely coincides, and everything intermingles, or crosses over’. Deleuze and Guattari explore the smooth/striated through the visual
field (this is in the section on ‘The Aesthetic Model: Nomad Art’). They suggest that the striated ‘relates to a more distant vision, and a more optical space’. By utilizing a particular medium -the digitized stereoscope already referred to in the diplorasis- we might be able to consider how these notions of smooth/striated, and to ask how the digitized stereoscope conflates –through embodied visual representation- both smooth and striated space?

In order to address this question it is necessary to return to the analog stereoscope. The Wheatstone stereoscope\(^{17}\) depends on a precise striation of the image. In order for the stereoscopic image to emerge, the calculated angle differentials of each stereogram must correlate to the discrepancy of the binocular visual cones. Through the mirrored projected the simulated image re-creates an illusionistic depth, by playing with the angle differential of each eye. As the monocular eyes separately receive the two images, the very monocular functioning is accentuated. A calibration of the dual monocular cones and their overlap induces an-other visual image. The image is initially striated. It is split and re-stitched in a particular way, taking into consideration the geometrical overlapping angles of the eyes in the construction of the image. This geometrical manoeuvring creates an illusionistic ‘depth’. The striation of the setup gives way to an indeterminate state where the perceived planes hover around a voluminous mobile illusionistic depth.

Striation produces a smooth space where the image is without top, bottom, left or right. This smooth field is nonetheless contingent to the striation of eyes and the technical ensemble. If you close one eye the smooth space disappears. The stereoscopic image induces an intermingling between the tactile and optical as they conflate to trigger a haptic environment.

Through this visual instrument the relations between referent and represented image are discontinuous. This discontinuity however, is different from the one assumed by projective drawing representational forms (i.e. perspective). Within the stereoscope the discontinuity between the referent and represented image is part of a process that actively involves the operation of the body. In perspectival representation the discontinuity is of another kind, it assumes an a priori discontinuity of body and represented object. In linear perspective the distance between body and object is determined through an abstract geometrical construct inscribed on the picture plane. The perspectival picture plane is a static screen that reduces either side –body and world/object- to an invariable form.

The discontinuity assumed by the stereoscope between referent and represented image aligns it with digital image processing. The possibilities offered by the digitization of the stereoscope offer a way from which to think of striated/smooth space. Digital media and stereoscopy increasingly converge on the surface of the screen. The digital screen in this case communicates with both its referent and its viewer through informational loops. All digitized processes involve input-output commands, i.e. a discontinuous process. What this means is that in order for the screen to be perceived by humans the machine-readable code requires digital-to-analog conversion. This is because the ‘computer stores meta-pictorial information in a fragmented array of discrete numbers, which cannot communicate directly with the depicted or the observing world’. The digitized stereoscope thus involves two types of discontinuities: the perceptual discontinuity of referent and represented image and the input-output discontinuity that converts digital-to-analog informational. This second level of discontinuity makes it possible for the stereoscopic image to become attached and extended to a whole range of external ‘inputs’ – from other bodies, objects and the environment. Crucially the interaction of the two intervals possibly re-produce zones where smooth notions of space further intermingle with as well as disrupt striated spaces.
COLLAPSE OF DISTANCE

Thus the digitized stereoscope can be constantly manipulated due to the digital screen. As Lev Manovich posits, the immersive V.R. headset has superseded the dynamic field of the cinema. In a passage from *The Language of New Media* he writes that ‘virtual space, previously confined to a painting or a movie screen, now completely encompasses the real space’. He will go as far as stating that the screen has ‘vanished’. The suggestion of being completely immersed in the virtual domain however also poses the risk of considering the body as a non-changing entity; this effectively would reduce the body to a Cartesian unit. It is important to distinguish between ‘the decentered self’ that is ‘repositioned as the locus of technio institutional forces pushing and pulling to achieve maximal efficiencies’, and the creative applications of the body in new media. In the former the striated forms of space are extended to the virtual domain. Through the latter it is possible to further explore the slippery interval between geometrical reasoning and perception, smooth and striated space, virtual and actual. The digitized stereoscope encountered in head mounted VR headsets does not necessarily suggest an escape from the visceral body; instead the emerging stereoscopic medium can expand our understanding of this very interval.

The distance posed by Evans between the ‘object of thought’ and the building through the media of architectural representation, implies a static body in space. Orthogonal and perspectival drawing media are developed from a calculated distance. The emphasis placed within an instrumental digital architecture aims to optimize this control. This pushes the thinking of space towards more and more striated forms, as more tools are developed for measuring and controlling our environments. Digital media are thus to a certain degree developed to behave like older media forms. They are made to be faster, crisper, more efficient versions of projective drawing methods. The ontology of the digital is thus reduced, and its field of possibilities limited. What is proposed here is how emerging digital media enable new ways by which to think of the interval between smooth and striated. The development of the stereoscope from its analog to its digitized version as seen in the *diplorasis* includes both geometrical striations as well as a range of circuits; circuits involving both the sensory field and external objects. As such the digitized stereoscope is not isolated from geometrical logic, yet it moves beyond its determinations by setting up particular dis-continuities. The smooth/striated space of the digitized stereoscope reveals an-other conception of space. The alternative for considering geometrical extensity is thus not the anthropocentric perceptual framework but instead a sensing body that is plugged into informational media loops with other bodies and machines. Much like the cinema did over a century ago, this enables us to glimpse at a paradoxical image of time, after the event. Yet this emerging image is not the cinematic image, as it increasingly moves with-in the body. As the distance in the translation from drawing to building collapses, the drawing itself is perhaps liberated from architecture’s instrumentality. What is thus changing is the role of drawing in relation to building; its forms of representation and consequently the way architecture will be designed. New media processes could enable architecture to move beyond its geometrical determinations.
REFERENCES

1 Here Evans is comparing the architect’s mode of representation to painters and sculptors that work directly with
the object. Robin Evans, ‘Translations from Building to Drawing,’ in Translations from Building to Drawing and
Other Essays (London: Architectural Association Publications, 1997), 156. Leon Battista Alberti’s treatise on linear
perspectival representation in Della pittura (1435) is the seminal work that investigates this distance.

2 Evans, ‘Translations from Building to Drawing,’ 156. Evans is referring to Philibert De l’Orme.

3 In linear perspective the body is either reduced to the eye of the observer (i.e. reduced to the geometrical
coordinates of the eye) or to the image of the observed (i.e. represented in the image that is reduced to the
géometrical coordinates of its ‘envelope’/figure). For an overview of linear perspective see: Leon Battista Alberti,


5 McLuhan, Understanding Media, 314.

6 McLuhan, Understanding Media, 55.

7 McLuhan, Understanding Media, 305.

8 McLuhan, Understanding Media, 354.

9 McLuhan, Understanding Media, 354.

10 Gilles Deleuze and Felix Guattari, A Thousand Plateaus: Capitalism and Schizophrenia, translated by Brian
Massumi (London: Bloomsbury Academic, 2016), 561.

11 Deleuze and Guattari, A Thousand Plateaus, 561.

12 Deleuze and Guattari, A Thousand Plateaus, 561.

13 Deleuze and Guattari, A Thousand Plateaus, 562.

14 It is important here to note that the formation of this temporal multiplicity is linked to Deleuze’s reading of Henri
Bergson and the mathematician Riemann. Gilles Deleuze, Bergsonism, translated by Hugh Tomlinson and

15 Deleuze and Guattari, A Thousand Plateaus, 560.

16 Deleuze and Guattari, A Thousand Plateaus, 573.

17 The Wheatstone stereoscope invented by Sir Charles Wheatstone in the 1830s utilizes mirrors as opposed to
the Brewester lenticular stereoscope. The calculation of the angle differentials corresponds to the study of optics

18 D.N Rodowick, The Virtual Life of Film (Cambridge: Harvard University Press, 2007), 114.


20 Manovich, The Language of New Media, 97.

21 Manovich, The Language of New Media, 97.

22 The critique of VR stereoscopy can be broadly summarized via the following statement: ‘indeed technologies
like VR can be seen as the logical outcome of a process that began with the Cartesian grid and has continued to
be ever further refined, abstracted, and imposed upon the perception of the world.’ Frances, Dyson, “Space,”
“Being,” and Other Fictions in the Domain of the Virtual,” in The Virtual Dimension: Architecture, Representation

23 Dyson, “‘Space,” “Being,” and Other Fictions in the Domain of the Virtual,’ 39.
Various artists have explored VR stereoscopic formats in their practice. This includes works for example Jeffrey Shaw’s *Epidemics* and Char Davies’s *Osmose.*

**BIBLIOGRAPHY**


