

Eulogy to Paperless Studios: The Kernel of Pulsation in Architecture

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"After all philosophical insight into the nature of sensible knowledge had first been spoiled by making sensibility merely into a confused kind of representation...we have proved that sensibility does not consist in this logical difference of clarity or obscurity, but in the genetic difference of the origin of knowledge itself, because sensible knowledge does not represent things as they are but only the way in which they affect our senses..."¹
—Immanuel Kant, *Prolegomena to Any Future Metaphysics*

This presentation is both a eulogy to the paperless era, and a proposal for a new critical reception of digital design through a lens of rhythmic perception; a hopeful look at the possibility for digital design to move beyond mere instrumentality and engage with core aspects of the discipline through a new sensibility.

Paperless studios flourished during the early '90s propelled from the digital hub of Columbia University and quickly expanded throughout academia, infecting and inflecting the profession as well as benefiting from the feedback process activated by pioneering practices such as Greg Lynn, Jesse Reiser, Hani Rashid, and others. These architects overlapped design research practices with studio pedagogy favored by the pervasive culture of digital experimentation, and coupled by a fast culture of publications leading to cycles of excess and consumption. New generations of designers grew and multiplied the novel techniques afforded by computational literacy, basking in the glory of a new found faith in "technique based studios" whereby projects pushed a new craft, an expertise in handling ever more complex geometrical calculations and astounding effects. The decade was marked by the boundless pursuit of new spatial

sensations, freed from the constraints of Euclidean geometry and tired notions of typology. As a consequence of such exuberant and often times overindulgent experimentation, the conceptual breadth of digital design grew thinner and it has been difficult ever since to develop new objectives for such work beyond the physical pleasures of digital fabrication. The death of paperless studios engendered the discourse of *rhythmic affect*.

The development of advanced three-dimensional digital tools and the subsequent, ever increasing sophistication of design skills has contributed to bring to the fore, liberate and elicit a sensibility of curvilinear, rhythmical design in contemporary architecture.

Baroque architecture and Art Nouveau are only part of an extensive lineage of a sensible knowledge infused by sensual overtones and spatial inuendo, requiring a cyclical readjustment to situate a drifting paradigm of perception.

Gabriel Esquivel explains how the moment of transformation we currently find ourselves in leads to an understanding of a new paradigm of motion under which architecture changes its formal conditions and becomes a new structural entity expressed digitally and technologically from the rendered animation to construction and fabrication.

"It is no accident that the prime example of an art that is purported to move the spirit, it is also an art which seems to possess motion. In his seminal study, Renaissance and Baroque, Heinrich Wölfflin proposed 'movement' as the principal characteristic of the Baroque architectural style. In the time and motion of the person observing the building, one imagines the columns moving forward and back, the walls thrust-

ing outward. Thus the motion lent to the building by the peripatetic observer is more than a simple psychological identification. Another aspect of the Baroque described by Wölfflin was the importance of the sense of 'weightlessness' that in spite of its tectonics and materiality, architecture could produce the effect of elements levitating; defying gravity. The transition from the Renaissance to the Baroque via Mannerism produces a kind of liberation from the former architectural indexes; when Michelangelo integrates figuration into the steps of the Laurentian Library it becomes a crucial moment according to Wölfflin. I would venture to say that we are in a similar moment; the transition between indexical architecture to a new condition by the exacerbation of the surface conditions to produce new effects; something called hyper-indexical.²

Esquivel goes on to establish a link between the flowing forms of Art Nouveau and their connection with a fascination of Art Nouveau architects with the discovery of cinema, which unleashed energy pertaining to the exploration of motion in design, a precursor to Antoine Picon's observation of performative effects in contemporary, digitally driven design.

The condition of motion is explored in many architects of the Art Nouveau, the interaction of two dimensional patterns with three-dimensional ornamentation and objects like in the Tassel Hotel by Victor Horta, the undulating interiors by Henry Van de Velde, the potential of the use of new materiality like the Metro Stations by Hector Guimard. These projects all amount to those conditions of how form, pattern and ornament produce the sensation of motion.²

RHYTHMIC AFFECT AND SENSUAL PERCEPTION

Given its lineage of motion-based spatial paradigms, "Pulsation" creates an awareness of sensual perception related to movement, an enigmatic relationship between space and eroticism, not unlike the obscure relationship between philosophy and sex. In sex can be found the history of a cry, a rhythm, a syncope, a word wrenched from the body, scorched by *jouissance*. It is the history of the rhythms that crop up in speech well below the level of words but that constitute the history of speech, its soul, as is said of the very fine threads wound around a thousand times inside the sheath of a rope and that may break without appearing to weaken the strand. This rhythm is the intimate order of thought, its silent architecture, its main reason for being. Merleau-Ponty put it this way:

"My body and the other person's are one whole, two sides of one and the same phenomenon, and the anonymous existence of which my body is the ever-renewed trace henceforth inhabits both bodies simultaneously."³

These two sides of the same phenomenon cause a sequence, a musical scansion, to appear; where the body begins and ends is where space begins and ends." The whole history of literature is about rendering this rhythm, making it give up what it has swallowed, as it were, so that the rhythm can charge the text with something other than the meaning of a word, a sentence, a story.

Philosophy has exiled itself once and for all from the question of rhythm and of all "architecture", the architecture that is first of all a rhythm, a step; architecture as the genius of spacing within matter, between words, within words, in space, words that come to scan silence, to stop it.

Concerning this architecture, philosophy can only gloss, interpret, wonder why rhythm is present as soon as there is thought. Rhythm (that is, architecture) inhabits thought like a matrix prerequisite to all thought. Locked within all architecture there is a cry, there is speech extracted by force from silence or from screams. But architecture cannot accede directly to this speech either through meaning or through language; it can more effectively do it spatially, viscerally. Philosophy, for its part, has taken up a position in the vicinity of this muted music. It can neither join in the music nor stifle the sound, since philosophy, too, as language, has its origins in that same music. What philosophy envies in sex is precisely the fact that sex inhabits this rhythm.

Nothing structures sex but the primordial relation to rhythm—body, skin, blood, mixtures, saliva, suffering, pleasure—that contains the initial pulsation of the living—in the place where space is born, in the place where the earliest stammering mingles with the body and with the world, with the soul and with matter.

If philosophy has conceived of itself as prolegomenon to discourse about the world and reality as a whole, prior to all other discourse, this is because it seeks to situate itself at the origin of human questioning at the place where one interrogates the very first things: I-you-world-being-value-beauty, and so on. Yet in the beginning there is rhythm, there

is a pulsation that inscribes difference in unity. The earliest scansion —empty/full, silence/noise, light/darkness, I/you—preside over every genesis.⁴

This primordial notion of rhythm is harnessed by contemporary design practices concerned with the singularities of beat as a fundamental condition to spatial perception, an agency for the production of synthetic part-to-whole relations in architecture.

RHYTHM AND NOISE: SITUATING A GRADIENT OF SINGULARITIES

Within the gamut of architecture, design, and art practices defined by *rhythmic affect* there exists a range of distinctions that differentiate all practices, according to the specific spatial effects being pursued, originated in unique generative design techniques such as cellular aggregation, single-surface, smooth modularity, adaptive behavior, etc.

To the untrained eye, all digitally driven practices look alike. And yet the combinatory logic of each one of these techniques and methodologies produces a unique range of spatial and material effects, driven by seemingly subtle methodological and technical differences but producing radical diversity in the architectural outcome. Even though it has been abused as metaphor, a valid comparison can be made with the field of music and the—sometimes—polemical differentiation between sound and noise. Pulsating practices often times stretch this differentiation, exploring the full range of potential that resides in the gradient, straddling that line and risking, as it were, the assumption that “it is just noise.”

Musicians and musicologists often employ a very narrow technical notion, under which a sound is a noise only if its originating frequency is nonperiodic and thus of no determinate pitch, or at least random relative to human perception. In such cases the sound wave appears as irregular, seeming to offer a determinate pitch in relation to other sounds. Luigi Russolo asserts that sounds are normally distinguished from noises according to the richness of timbre: “The real and fundamental difference between sound and noise can be reduced to this alone: noise is generally much richer in harmonics than sound. And the harmonics of noise are usually more intense than those that accompany sound.”

When one is interested in exploring texture, timbre, and rhythmic values—hallmarks of rock music—amplification and the electronic mixing of sounds allow for more “noise” into the mix. The result is not noise in the sense of unpitched sound, indeterminate pitch, or disruptive sound.

“We want to give pitches to these diverse noises, regulating them harmonically and rhythmically. Giving pitch to noises does not mean depriving them of all irregular movements and vibrations...there may be imparted to a given noise not only a single pitch but even a variety of pitches without sacrificing its character, the timbre that distinguishes it.”⁵

Selective electronic amplification is the best means of bringing about enriched overtones while preserving determinate pitch. The resulting music can thus conform to expectations of melody and harmony while expanding in another dimension. Rock musicians exploit technology for new and richer timbres while still maintaining recognizable melodic contours.

Similarly, digitally savvy designers are able to control complex operations of calculus that drive surprising architectural conditions far beyond the limits of representation, and into the realm of direct 1:1 material explorations facilitated by processes of digital fabrication. Rhythm is involved in the genesis as well as the ultimate materialization of atmospheres that affect our sensual perception and our experience of space.

Pulsation seeks to examine and bring forth the practices that participate in such primal, rich, and intensive discourse of rhythmic perception, a subject as old and fundamental to the field as the relevance of part-to-whole relationships, now coming back with a vengeance!

FROM PAPERLESS CULTURE TOWARDS A HYPER-INDEXICAL, PERFORMATIVE FIELD

Hyper-indexicality may be introduced as the end of indexical architecture and its formal premises, from Le Corbusier’s five points in the earlier twentieth century all the way to Colin Rowe’s reinterpretation of the modern diagram in the 1960s that has dominated the last fifty years of architectural discourse. Moreover, hyper-indexicality invokes the search of something new based in the potential of new representation, new construction methods, fabrication and consequently the desire for a new aesthetic. What digital technology has allowed is

the ability of exacerbating the architectural indexes in the production of a new hyper-indexicality that has resulted in the possibility for a new era. The origin of the topological interest is situated as the search not only of a performative component like geometry, materiality, conductivity, etc., but as an emotional encounter called affect and therefore the production of atmospheres and moods. Hyper-indexicality is inclusive of architectural conditions derived from performative agendas.⁶

Performance is a charged word in architecture and in all other design disciplines, usually interpreted as invoking efficiency and the measuring activity implied in the effectiveness of a given design.

Antoine Picon depicts a more interesting scenario “reading” into the embedded performative potential of digital initiatives vested in the attempt to envisage a modified field of perception beyond the aesthetics of machinic efficiency. He approaches a definition to the affect of horizontal speed, explaining how the automobile has transformed our notion of materiality and perception of the city in a way analogous to the computer, given the perceptual shift it has effected on designers and buildings alike.

“The automobile experience is synonymous with a series of sensations, from the accelerations and decelerations to the feeling provoked by the wind; these are sensations intimately linked to the use of the engine. We have become so accustomed to horizontal acceleration that we take it for granted, forgetting how this sensation was unattainable in former, non-mechanized societies.

The very notion of space is altered through the redefinition of perceptual entities, through sensations like acceleration and the change in the existential status of our entire body that we experience while riding a car. The automobile has not diminished our physical perception of the world. It has modified it. It has displaced the content and boundaries of materiality. Using the automobile as a metaphor, it is now tempting to interpret the computer as a new vehicle that induces another displacement of physical experience and materiality.”⁷

Digital architecture and its advocacy of mediated and distributed subjectivity is paradigmatic of the new relation that prevails between man and his technological and urban environment. This new distributed subjectivity may very well align with

the sensibilities projecting from a meta-tuned field of perception enabled by technology, where the awareness of rhythmic patterns and pulsation are just a form of acknowledgement of the way that technology, communications, and information flow. The information that affects cities, affects our notions of time and travel, thus our constantly shifting identities and our comprehension of architectural space are embedded in the latent potential of pulsating rhythms.

CASE STUDY: THE EVOLUTION OF PAPERLESS CULTURE THROUGH THE PULSATING RHYTHMS IN GREG LYNN’S *FOUNTAIN*

A good example of the interplay between some of the attributes of these categories is a recent installation by Greg Lynn, whereby the rhythmic pulse is a fundamental factor of unity and character.

Greg Lynn’s *Fountain* is not part of a historical network of water veins running underground such as the fountains in Rome neither is it the manifestation of pluvial infrastructural initiatives in Los Angeles, but it is a project that veers on the expanded field of both sculpture and architecture: situated in a courtyard, stripped from urban roles or Bernini-Borromini-esque drama, integrated within a nascent network of installations and sculptures at the Hammer Museum’s outdoor spaces (a new series curated by Sylvia Lavin). Sylvia Lavin explains the ambiguous character of this fountain relating it to the work of a diverse group of contemporary artists—including Olafur Eliasson, Anish Kapoor, and Jeff Koons—not only to evoke what Rosalind Krauss calls the “expanded field” or conceptual territory between sculpture and architecture, but doing so precisely in order to position a new relationship between thinking and seeing, denoting visual intensity to produce perceptual swerves that ask new questions such as “what kind of object is this” rather than conforming to old thoughts.⁸

Greg Lynn defined in *Folds, Bodies & Blobs* the notion of repetition as evolutionary differentiation,⁹ leading many years later to the concretion of a pliant modularity in *Fountain*, by synthesizing and interjecting the notion of vicissitude by way of the seams and creating the conditions for a paradoxically fixed and adaptable system. Such advancement was made possible by techniques of repetition that incorporate two kinds of evolutionary dif-

ferentiation: endogenous (the unfolding of unmotivated internal directives towards diversity) and exogenous (the unfolding of external constraints towards adaptability). The dynamic combination of internally directed indeterminacy and externally vicissitudinous constraint is absorbed by packs of smooth and striated, idiosyncratic seams, specifically through rhythm.

The rhythmical operations in *Fountain* require the definition of another formal iteration between or beyond sculpture and architecture, producing a paradigm for a multiplicitous monument, which sustains its ambiguity through its resulting image being neither monolithic nor pluralistic, instead belonging to a now supple and flexible, yet precisely calibrated field of CNC milled joints belonging to toys. These toys, paradoxically, supply rigid joints that define a lumping assemblage where each individual component defers its internal structure to benefitting its alliance, from the fluid movements of the whole. The pulse that is telegraphed throughout the seams of the affiliated toys, charge the connections with a certain frictional energy that is simultaneously stored and distributed across the entire field of surfaces, denoting an even suppler paradigm of the multiplicitous body, which we may now call "NON-ument". The resultant formation of piled bodies cannot be reduced to any single type; it is an assembly of micro-systems whereby the unified image of the lump unravels into heterogeneous local event of the whole. "NON-ument" is neither discrete nor dispersed, but rather turns from any simple organizational idea toward a system of local affiliations generated digitally and ultimately calibrated in analog mode.

The rhythmical properties of *Fountain* hark back to the sensibilities of the "flicker". Rosalind Krauss explains how the flicker film was invented to stop time, to disable the afterimage's perceptual mechanism by means of which the visual "persistence" of information contained in one film frame would bleed into the next, creating the illusion of an uninterrupted flow of movement. This stoppage, the reasoning went, would make it possible to look past the illusion and actually "see" the basic unit of film, the real support of the medium: the single frame. The flicker in turn was a constant inconsistency meant to establish a pulse through the images, not allowing afterimages to affect the current image. *Fountain* establishes a consistent current-image through flicker's subtractive process of vi-

sion; both the aggregation (coiling ripples) and de-aggregation (shredded apertures) are embedded in the "cumulative will" of the geometry of *Fountain*. Such volition is negotiated through smooth and adaptable seams.

This close reading of the affect of the flicker film—as defined in the Foreword—applies well to the sensations of pulsating rhythms in the articulation of surfaces in *Fountain*, energized by the effects surging from an increased awareness of detail within a sensibility of topological articulation. Rhythmic effects accentuate the afterimage of detailed ornament as a trace, an index of activity registered upon architectural membranes which denote spatial transformation and difference.

Characterized by properties of robustness and adaptability, *Fountain* comes across through the rhythmical properties of the pulsating pediment which mediates the fountain and its environment, as well as sets up the articulation of toy-figures, which in turn forecast the ambient background effect against a foreground of carefully piled bodies oozing from the weaker form of the whole. Pulsation—as defined by the combination of weak form and rhythmic energy—becomes the throbbing life force of *Fountain*, precluding and internalizing vicissitudes of coy toy-like figures, now lumping free of their original iconicity, spewing and re-circulating their liquid load on the central array of lumped components. This rhythmic perception of space might address multiple enigmas of spatiality in architecture...its weak form. With this weak form, sublimity and beauty become functions of affect, essentially creating with it a new awareness of the pulse, as well as a new paradigm of control through residual form.

CONCLUSION: DIGITAL FABRICATION AS THE SOLIDIFICATION OF TRAJECTORIES STEMMING FROM PAPERLESS, DIGITAL, AND VIRTUAL CULTURE

As demonstrated with Greg Lynn's *Fountain* project, the research originated with the culture of paperless studios has followed a steady trajectory of maturation accompanied with the increased availability of digital fabrication technologies. These, in turn, would have not been adopted in architecture unless a lineage of digital designers pushed for the need to expand the repertoire of construction, affording designers unprecedented degrees of free-

dom. This evolutive path has given birth to new genders in contemporary design, allowing for the emergence of specific spatial/morphological problems and opportunities that owe their reason of being to the pioneering research of the paperless era. Digital design and fabrication are the ultimate evolution of a digital culture that has its origin in the *Deconstruction* exhibition at MoMA which caused the first of a series of rippling revolutions throughout the discipline, harking back to the proto-modernism of the Art Nouveau and even further back to the Baroque period, in a continuum of pulsating expansion moves of the discipline. They are currently expanding the potential for architecture to look into new performative conditions in space, allowing for the scale of the body to reintroduce a sense of humanism into morphological and spatial pursuits, as well as creating potential bridges with other eras where body and space were inextricably linked, such as the Baroque and Art Nouveau periods.

The evolution of a paperless culture into built outcomes creates critical inroads into the future of design sensibility: a cyclic revision of spatial paradigms, periodically fueled by technological innovation!

ENDNOTES

1. Immanuel Kant, *Prolegomena to Any Future Metaphysics*, ed. and trans. Peter G. Lucas (Manchester, U.K.: Manchester University Press, 1953), 46-47.
2. Gabriel Esquivel, *Affect and E-Motion* (MX Design Conference, Form + Desire: <Linked Projects> potencial, Universidad Iberoamericana, Santa Fe, Mexico City, Mexico, 2007), 3-4.
3. Maurice Merleau-Ponty, *Phenomenology of Perception*, trans. Colin Smith (London: Routledge and Kegan Paul, 1962), 354.
4. Anne Dufourmantelle, *Blind Date: Sex and Philosophy*, trans. Catherine Porter (Urbana and Chicago: University of Illinois Press, 2007), see Rhythms, 47-48.
5. Luigi Russolo, *The Art of Noises*, trans. Barclay Brown, Monographs in Musicology, no. 6 (New York: Pendragon Press, 1986), 27-39.
6. Gabriel Esquivel, *Affect and E-Motion* (MX Design Conference, Form + Desire: <Linked Projects> potencial, Universidad Iberoamericana, Santa Fe, Mexico City, Mexico, 2007), 3-4.
7. Antoine Picon, *Digital Culture in Architecture: An introduction for the Design Professions* (Basel: Birkhauser, 2010), 148.
8. See Rosalind E. Krauss, "Sculpture in the Expanded Field," *October* 8 (Spring 1979): 30-44; reprinted in *The Originality of the Avant-garde and Other Modernist Myths* (Cambridge: MIT Press, 1985): 276-90.
9. See Greg Lynn's *Folds, Bodies and Blobs: Collected Essays*



Fig.1: Greg Lynn FORM – Fountain, Hammer Museum, Los Angeles

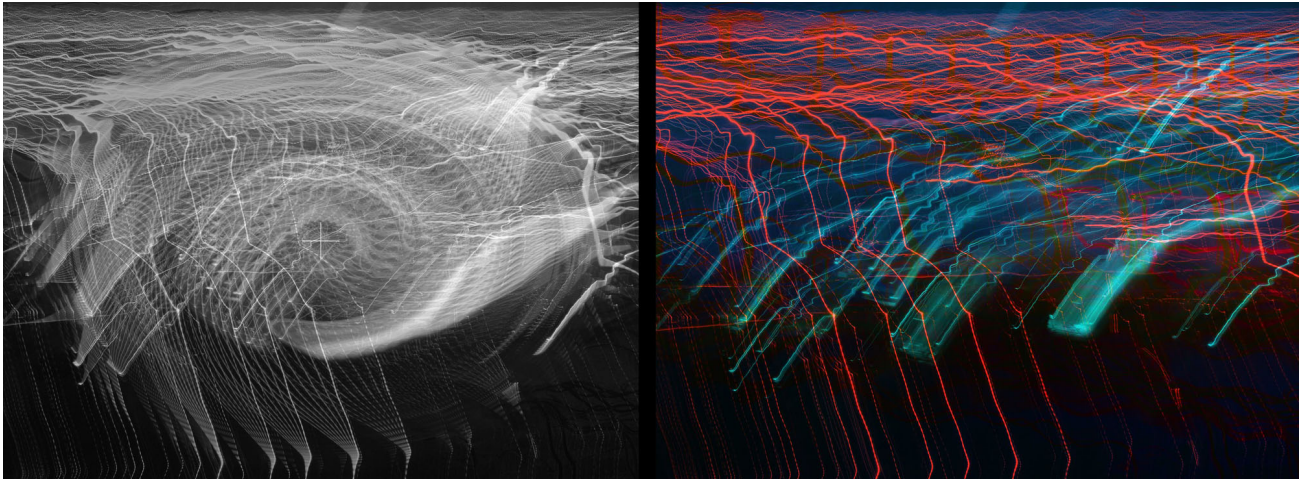


Fig.2: Rhythmic perception diagrams – Digital Fabrication seminar by Eric Goldemberg – Florida International University

