

# SYNESTHESIA AND DIGITAL PERCEPTION<sup>1</sup>

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## Abstract:

Perceptual habits of western culture since Greece operated through a synesthetical approach to reality that lasts until 18th century. Modernism separated the senses, and modern art has operated through this logic. But contemporary digital culture seems to be again turning into those older models of perception, largely synesthetical. This article tries to define some aspects of the synesthetic experience, briefly traces some cultural historical references, and then proposes a concept of digital perception, the kind of contemporary experience supported by digital technological apparatuses.

## I. Synesthesia

The word "synesthesia" has a Greek origin: "syn" (simultaneous) plus "aesthesia" (sensation), meaning "many simultaneous sensations" – unlike "anesthesia", or "no sensation". These last ten years, from the term *synesthesia* I have been developing some ideas concerning the relationship among art, technology and perception. The first reference to this term is usually attributed to Pythagoras and his *Harmony of the spheres*, which, among other things, implied sensory fusion. Its most common usage in art dates from the symbolist poetry of the 19th century – Baudelaire, Rimbaud etc. However, there is a true lineage of artistic works, whose origin goes back to the 18th century, and which share common synaesthetic aspirations despite socio-cultural and technological contexts of quite distinct periods.

Synesthesia has also a fascinating history in the domain of sciences – psychology, physiology and neurology. Since at least three centuries there have been reports

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describing people who, exposed to a stimulus related to a certain sensory modality, experience a sensation in a different modality.

In the 19th century, such interweaving possibilities among the senses were the subject of a great number of works, especially after 1870. Due to the rise of behaviorism, after the decade of 1930, there has been a significant reduction in the amount of these works. In the last decades, however, the progress of neuro-cognitive sciences and the research on the brain and consciousness, assisted by technological resources, made it possible to observe brain processes previously unattainable, generating a new wave of interest for synesthesia and for what it can reveal about cognition.

Besides being again the subject of neuro-cognitive research, through the works of Marks (1974; 1987), Cytowic (1989; 1993), Harrison and Baron-Cohen (1997) Harrison (2001), Grossenbacher (1997) and Ramachandran and Hubbard (2003) and others – the term has appeared with increasing frequency in literature dedicated to contemporary culture (Marshall McLuhan, 1995; Eric McLuhan 1998), to the visual arts (Moritz, 1985), color (Riley II, 1995), anthropology (Ackerman, 1990), linguistics (Day, 1997, 2001), music (Kahn, 1999; Bosseur, 1999), literature (Nabokov, 1966) or even to multimedia (Cook, 2000). Recently (2002), I have released a book in Brazil about my work. Synesthesia has also appeared in magazines, newspapers, radio and TV. On internet, at least two international mailing lists gather communities dedicated to the theme. In may, 2003, in New York, the 3<sup>rd</sup>. American Synesthesia Association Annual Meeting took place. In what follows, I would like to point out under which aspects synesthesia seems to correspond to the contemporary perceptual experience, and to propose the concept of *digital perception*, which I see as broadly synesthetic.

## II. A singular experience

First, I would like to return quickly to the neurologists' research. When I began, I've dedicated some time to different theories that tried to explain synesthesia. Today, however, my attention is focused especially on aspects of the synesthetic experience that can be extracted from there. Especially because, being a subject of quite recent works, all the more the transitory aspect of the scientific truth is relevant here, whereas the description of the experience of the so-called synaesthete is the starting point of all these researches and the point which they converge on.

We will begin with a classic report. In *The mind of a mnemonist*, Alexander Luria tells how his patient S., endowed with an exceptional memory, and he himself a synaesthete, describes the experience of listening to film director Serguei Eisenstein's voice:

*"(...) You know there are people who seem to have many voices, whose voices seem to be an entire composition, a bouquet. The late S. M. Eisenstein had just such a voice: listening to him, it was as though a flame with fibers protruding from it was advancing right toward me. I got so interested in his voice, I couldn't follow what he was saying... (...)"(Luria, 1986, 24)*

Such testimonies – and there are many of them – lead neurologists to reassess the nature of our perception. In evolutionary terms, human being's different perceptual modalities are interrelated by a number of factors. Out of the dialogue among these modalities depends, for instance, the construction of a conscious and coherent representation of reality, indispensable to survival (Grossenbacher, 1997). The senses confirm each other, and we have faith in the world – as well as we perform in there in an effective way.

This dialogue can be thought of in three directions. The first of them is physiologic. Lawrence Marks (1997) shows that our perceptual modalities share some common dimensions. For instance, discontinuous stimuli in frequencies above 20Hz applied to the visual, auditory or tactile fields give us an illusion of continuity – the illusion of movement in movies, the sensation of sound or of a continuous pressure. Low sounds seem to be wider and darker; high sounds, smaller and brighter. Such dimensions allow that sensations specific to a modality may be described in terms of another one. We refer spontaneously to a *harsh sound*, we describe a pleasant voice as a *sweet voice*<sup>3</sup>. Those dimensions seem to be, above all, biological properties of the perceptual apparatus.

Secondly, such associations may also reveal some supposedly universal aspects of experience. The Pythagorean *Harmony of the spheres*, the *golden reason*, Jungian *archetypes* and even Peirce's *phenomenological categories*, for instance, propose structures or qualities which permeate the whole human experience. In this sense, Cytowic (1993) suggests that the pleasure provided by firework shows would be in the way by which they (re)present essential structures of our perception, the *form constants* – perceptual archetypes, it could be said. In the third place, there is the cultural aspect: each culture determines its own perceptual habits, to which associations among senses also respond – for instance, whether in the way we hope that an orange flavored soft drink should have orange color, or when we refuse to believe that a wine colored scentless and flavorless substance could have the same smell and flavor of a glass of water (Morrot et al, 2001).

The experience of the synaesthetes allows us to examine such processes more closely. For them, cross-modal associations are noticed in a more intense way, emerging in the form of a sensation, with common qualities and idiosyncrasies. Neurological studies allow us to state that the synaesthetic state of perception, or at least a more intense state of modal crossover, is typical of childhood. Synesthesia is a natural property of the perceptual system of newborn babies and

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<sup>3</sup> On synesthesia and synesthetic metaphors, see Day (1996)

is more easily found in children. Moreover, the state of fulfillment through sensation, or losing yourself in sensation (as opposed to reason), can be related to a cognitive mode of childhood, *where the here-and-now of sensation prevails over the durable symbolic universe, typical of verbal cognition*. Our increasing 'conversion' to the more 'flexible', practical, rational and efficient universe of the symbolic places words between us and the world.

It is not important how far we stand from direct experience, nevertheless, cross-modal associations remain in ordinary language – metaphors already presented demonstrate it. Although language is, at the same time, representational and creative, allowing for games and paradoxes, generating new kinds of meaning which exceed the biologic modal crossings, these are on the basis of our cognition and, it has been suggested, in the origin of language. Following Marshall McLuhan, Eric McLuhan presents language as a kind of perception treasure effective in culture.

We are then ascribing certain properties to the synaesthetic experience: it appears to us as a *pre-verbal direct experience* of the world; an *immersion in sensation*, as opposed to an analytical rational one; a specific experience of time, a *nowness* time, a *here-and-now* presence – almost as a delay, a time dislocated from the diachronic linear time of ordinary experience. So, being opposed to decisive aspects of our analytical consciousness, synesthesia presents itself as a particular kind of consciousness, a gestalt, a structuring of the world that provides a different cognition – which the synaesthete experiences and appreciates but is not able to express. Such qualities lead Cytowic – in a surprising twist – to compare the synaesthetic experience to the spiritual ecstasy, as described by William James in *Varieties of religious experience*.

### III. A world of sensation

Kandinsky, in 1910, while giving his definitive step toward abstraction, states:

*"(...) lend your ears to music, open your eyes to painting and... stop thinking! Just ask yourself whether the work allowed you to 'walk about' into a hitherto unknown world. If the answer is 'yes', what more do you want? (...)"* (Kandinsky, 1910, apud Cytowic, 2000: 56)

I would like, then, to make brief comments on some poetics which have involved synaesthetic aspirations – they define a pattern, which I will try to outline. Most works are in the fusion between sounds and colors where is located the first color-keyboard, conceived by the French priest Louis Bertrand Castell, in the 18th century. Looking for a music of colors inspired in the texts of the restless Jesuit Athanasius Kircher, Castell is setting in motion the long marriage between spirituality and the synaesthetic poetics, which the following centuries will reiterate. In making a compilation of works usually associated to synesthesia – and which have passed, under their synaesthetic aspect, far off the dominant aesthetic discussions of the last century –, we will find, in the works of Castell, Scriabin, Kandinsky, Thomas Wilfred, Oskar Fischinger, Olivier Messiaen, John and James Whitney, Jordan Belson, Ron Pellegrino, Jorge Antunes (and there are many others), all sorts of discourses and spiritual practices as driving forces of their poetics. Christianity, theosophy, anthroposophy, Buddhism, Zen, Rosae Crucis, Sufism... It is of less importance which doctrine was chosen by the artist, we will find the connection between synaesthetic experience and mystic experience, suggested by Cytowic, restated by works and discourse of such artists. Immersion in sensation, abandonment to the instant, a-rationality mark equally the fruition built by most of these works.

It is not relevant that any of these artists has been a synaesthete. While aspiring to sensory fusion in different ways, such artists created powerful representations of

such unity, synaesthetic signs that demonstrate an extraordinary coherence with the reports of the synaesthetic experience. While doing the evocation of one sense in terms of another, as Kandinsky or Messiaen did, or through the deliberate fusion of sounds and abstract images, as Fischinger, Whitney, Belson or Pellegrino did, synaesthetes and non-synaesthetes seem to have as referent the same cognitive experience. They describe a kind of dynamic kaleidoscope of sounds and abstract images – fires, photisms, colors, angular forms, sensual fogs – superimposing in different movements, forming something like an interface of sensation that can refer as much to the synaesthetes as to the artists.

### III. Acoustic Space

In Classical antiquity, the relationship between man and the world around him seems to have been understood as mediated by a kind of integrated block of sensation which gathered all the senses and related each one to the others, even all the senses to superior models of nature and Universe. Just like, for instance, Pythagoras's *Harmony of the spheres*, which articulated the whole sensitive world as an expression of the same mathematical unity. Two centuries later, Aristotle also affirms the unity among the senses in his *De Anima*. In the following paragraphs, I will try to briefly outline how such an understanding stood unquestioned until two centuries ago.

In medieval world, Greek philosophy will have enormous influence. Not only Aristotelian thought, but also the *Harmony of Spheres* – through Boetius – will mark scholastic thought, and the whole symbolic production of Christian culture will be the expression of this mathematical unity among the senses: music, painting, stained-glass windows or architecture emanate from a same superior harmony, a divine unity (Bosseur, 1999).

It is possible, however, to outline more clearly the relationship between synesthesia and medieval perception of the world through McLuhan and the

understanding of the medieval culture as an *oral* culture – in which knowledge is a collective patrimony, there is not a clearly defined notion of individuality, unity and meaning are a divine determination. McLuhan associates to oral cultures qualities of tribal worlds, opposing these to the culture raised in Europe after Gutenberg's typography.

"(...) *Before the invention of the phonetic alphabet, man lived in a world where all the senses were balanced and simultaneous, a closed world of tribal depth and resonance, an oral culture structured by a dominant auditory sense of life (...)* " (McLuhan, 1995: 239)

a perceptual bias thought of in terms of his *acoustic space* concept,

"(...) *space that has no center and no margin, unlike strictly visual space, which is an extension of the eye. Acoustic space is organic and integral, perceived through the simultaneous interplay of all the senses. (...) The man of the tribal world led a complex, kaleidoscopic life, precisely because the ear, unlike the eye, cannot be focused and is synaesthetic rather than analytical and linear. Speech is an utterance, or more precisely, an outering, of all our senses at once; (...)* " (McLuhan, 1995: 240).

To the acoustic space corresponds also a specific experience of time: unlike the narrative time, diachronic, measurable according to the mathematical determinations of the clock, which will be built during modernity, the medieval time is measured in terms of the divine calendar, the seasons, the crops, dawn and sunset.

Vilém Flusser (1998) as well attributes to writing the linearisation of thought and historicity, in such a way that the time experience in this oral world is the one he ascribes to imagerial thought – the experience of *time of magic*. It is a mistake to see an opposition here between Flusser's *imagerial* and McLuhan's *oral*: it's

above all a question of opposing the world which will be set in motion by the rational, organizer, linear printed verbal discourse, to that one which installs an essentially circular temporariness. The time of oral cultures is a-historical; its space is acoustic; its world, magic, theocentric; the relationship man-world, non mediated by texts. These are qualities that we've just attributed to the synaesthetic experience.

Medieval synaesthetic culture will be disassembled by a set of forces that culminate in the so-called Renaissance. But, while modernity establishes its path – and with it the primacy of reason over faith, the genesis of classical science, the increasing autonomy of the work of art and, especially, the constitution of the subject – the unity of senses will be preserved even through radical transformations in culture.

For Marshall McLuhan, the genesis of these transformations will be in the invention, by Gutenberg, of print, which makes possible reproduction in such large a scale as it had been unimaginable before of linearised thought in verbal printed language. The result will be the primacy of vision on the other senses and the end of the perceptual balance of the oral world,

*" translating its organic harmony and complex synesthesia into the uniform connected and visual mode that we still consider the norm of 'rational' existence."*  
(McLuhan, 1995: 240-241)

Such dissociation among senses, however, will take some time to constitute an operative mode of culture, noticeable in the testimony of perception rendered by arts. Visual arts, for instance, make one of the most remarkable shifts that constitute the Renaissance world, with the development of central perspective in the 15th century. This one, while transferring the organizer point of view to the subject, transfers as well the attribution of the world meaning, that before belonged to the divine order, to human consciousness. In the words of Panofsky,

perspective will be a *symbolic form*, that marks “*the fall of Antiquity’s theocracy*” and the beginning of “*modern anthropocracy*”. In other words, a structure that sustains the transition between two worlds.

We should not suppose that the whole inheritance of the medieval world could be swept with only one blow, just by the establishment of a point of view and of an escape axis that ascribed human unity to a previously disconnected space. Renaissance world manages medieval inheritance, and it still postulates neither a vision autonomous of other senses, nor an observer dissociated from cosmos: to know is a process of identification with a still magic organic world, filled with divine meaning. So, in McLuhan’s understanding, what is accomplished by perspective, while attributing a three-dimensional illusion to space, is precisely the transference, to visual representation, of the qualities of acoustic space which molded medieval European culture.

#### **IV. Touch me with your eyes**

This perspectival space, at the same time visual and acoustic, will be dominant for about four hundred years. Along the 17th and 18th centuries, we will see the consolidation of Gutenberg’s Galaxy, and those that McLuhan considers its side effects – primacy of vision, national state, individualism, rationalism, classical science, etc. Out of this process emerges a new and unique kind of relationship man-world, the modern *subject*. Jonathan Crary (1999)<sup>4</sup> describes it as the subject of the *camera obscura* – an observation technology that is, at the same time, an instrument that is used and a metaphor of knowledge. An idealized observer is delineated, one who is transcendent, separated from his own body and fundamentally different from nature and the universe that he observes and maps systematically and fragmentarily. However, if what was formerly identification becomes a science founded in the efficiency of *unidentification* and objectification

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<sup>4</sup> Many of the views here developed about perception in XVIIth and XIXth centuries are derived from Crary’s work.

of the empiric data, thanks to Descartes and Newton, it is not meaningless to remind that Newton still had strong ties with medieval alchemic tradition. The unity of senses, “a common surface of order”, as Crary puts it, constitutes the ballast of reality of such an idealized subject, almost-divine, in his relationship with a world still connected to magic. Senses constitute a sole fabric of sensation, inconceivable unless its nature, possibly different, can be compared to each other (by reason) so that they can be understood. From that we have reports such as Locke’s, about a blind man who describes the red color like the sound of a trumpet, or Condillac’s, whose statue receives the senses one by one, to constitute a consciousness of the world only when the process is completed. Along this whole process, perspective stays untouched, as a space of stable representation that confers unity and homogeneity to the world.

Some images offer great testimony of the relationship among senses during the period, especially touch and vision. In the 1724 edition of Descartes’ *Dioptrics*, vision is presented through the image of a blindfolded man who feels his way through the world with two sticks; Svetlana Alpers (apud Ackerman, 1995:94) describes images of blind men made by Rembrandt, as “*The blind man Tobias*” (1651), or “*The prodigal son*” (1669), as a way of “calling attention to touch activity (...) as an embodiment of sight” (Alpers, apud Ackerman, 1995: 94); Crary (1999: 64) makes a remarkable analysis of Jean-Baptiste Chardin’s “*Boy blowing bubbles*” (1739), stressing the form in which “vision and touch work cooperatively”, revealing a thought for which “haptical and optical are not autonomous terms, but constitute an indivisible mode of knowledge.”

## **V. Fragments from the book of machine**

In the threshold of the 19th century, Goya, in his *Caprice 50 – Las chinchillas*, presents two men wearing straitjackets and padlocks in their ears. For the British critic Guy Brett, such image shows clearly the denial of the body built by the subject of the darkroom; we could speak, in the same sense, about the loss of

direct experience of senses, result of the domain assumed by the book in the mediation of the relationship man-world – in fact, Goya will paint, later, *Book Readers*. I would like to suggest, however, something more precise. What Goya seems to be signaling to us, when he places such padlocks precisely in their ears, is the definitive end of oral culture – the medieval space that had resisted for four centuries immanent to the space of central perspective.

For a number of reasons, through different angles and different authors, the key word for the 19th century is fragmentation. Let's take, as does Coli (2002), the example of bodies in neo-classic painting, of Gericault and Ingres, made under the inspiration of Zeuxis's parable: beauty is created from the most beautiful fragments of nature. These, however, also generate monsters, like Mary Shelley's *Frankenstein*. For thinkers so different as Siegfried Krakauer, Vilém Flusser or Karl Marx, the 19th century produces a fragmented man and a fragmented culture.

Behind such a fragmentation there are, on the one hand, the reification of the operative logic of classical science, through the integration of machine to the daily landscape; on the other hand, the application of its singular method – "to divide and to conquer" – to the human body: placed in a biological body, with instincts, reflexes and desires, the transcendental subject becomes for the first time his own object. Such body is an active organism, producer of its own sensation. Modern physiology and neurology have their origin in there. Neural networks are unveiled; a distinct neural apparatus is ascribed to each sense; there begins the search for associating certain cognitive and motive functions to specific brain areas. In philosophy, such a process is well represented in Schopenhauer's work, whose philosophical effort consists in, from a quite profuse knowledge of the physiology of his day, proposing a form of perception which goes beyond the human being's animal facet, in the register of transcendence.

The nascent neurophysiologic research presents a double character. It will provide perception with a biological basis in which the body appears more and more as

producer of illusions. It is established here the possibility of a reality of specialized and autonomous sensations, without a referent in the real world, from which are born the kaleidoscope as well as propositions commonly associated to modern art, like John Ruskin's "innocent eye". Simultaneously, in a scenery now molded by the productive logic of the machine, the same research allow the progressive mathematicalisation and quantification of the subjective experience, which will give support to control, efficiency and productivity mechanisms – like Pavlov, Skinner and cybernetics.

The counterpart of a perception that becomes autonomous with regard to the referent is the referent itself which rebels: with the train, the steam machine, the incessant flow of goods, the consolidation of a capitalist logic which turns everything into processes of change and negotiation, imposing to the European society a series of transformations in a rhythm until then unexpected - eliminating Europe's pre-capitalist final traces - reality becomes volatile, ephemeral, unattainable through contemplation, intangible. Photography, the first of the mechanical techniques of image production on a large scale, marks this need to apprehend the instant that escapes, separating haptical and optical in experiences of different temporariness and spaciality.

As it becomes contingent on the biological materiality of the body, the subject, previously ideal, will experience along the 19th century an unusual crisis. If, on one hand, the triumph of mechanicism, manifest in the industrial revolution, elects the machine as the metaphor of the whole universe, on the other hand, when it turns the subject into its research *locus*, such science sees the clarity of reason being submitted to all sorts of embarrassments: the increasing affirmation of sensation, its autonomy in relation to the referent, the opacity to which biological contingency relegates the observer, and finally, its fragmentation by this same science – the triumph of science over faith, the Darwinist theory and finally, the elimination of tradition in a re-inaugurated world, made volatile by the technological

apparatus – lead to a crisis of the subject, in whose ends are, in the streets, Jack the Ripper, in the books, Dr. Jekyll and, in science, Freud and psychoanalysis.

While science fragments the body, autonomises and specializes the senses, art seeks its new place in a reinvented society. It flirts with all kinds of spaces suggested by the subjective vision, by binocular vision, or by the light projected in the retina. Finally, when it turns to its own undisputed territory, to the experience that is unique to it, it becomes modern art. When it chooses a purely visual character, it becomes flat: acoustic space disappears.

## **VI. The empire of the eye (for your eyes only)**

It is of less relevance that Kandinsky and Schoenberg bring about in their works a character that today can be thought of as synesthetic. For that reason, key theoreticians of modernism, like Greenberg or Boulez, will consider them tied to the past, contaminated by values of romanticism – they insist on representing something out there in the world: the soul. The essential feature of modern music and painting is their self-referencing, their autonomy in relation to the world, their vocation for the autonomous experience of a single sense: painting, for the eyes; music, for the ears. Modern art constitutes a kind of a semiotic machine that expands enormously the sign universe, but it excludes, in the strength of its operative logic, body, narrative, representation, world: at last, it becomes hollow. When such process exhausts, everything that had systematically been left since Goya, on behalf of specialization, of purity, of the rational and fragmentary realignment of the world, comes back. The world to which the images return, however, is no longer that of nature: it is the one of mass-media; we will listen to words like “inter-media”, “mixed-media” and hybridism of all forms; we will see the return of the body, which claims its integrity, its temporariness, and the direct experience of senses. But we will also have a new technology – the digital one.

## VII. Digital perception

We traveled a large itinerary – in doing so, we left behind many subjects. A little ago, we attributed certain qualities to synaesthetic experience. In addition to associating synesthesia to a direct experience, a-rational, non-mediated by language, which seems to share certain similarity with states of consciousness that our culture classified as spiritual or mystic, we have also attributed to it specific temporariness and spaciality: a *nowness* time; an acoustic space. We have also talked about McLuhan, and it is useful to remind that, in the core of his thought, is the idea that technologies, while impose a reorganization of our senses, mold the way in which we organize thought and knowledge.

I would like to suggest that it is not a coincidence that digital technology is directly implicated in synaesthetic representation processes recovered with the end of modernism. It is out of question to state here that such sensitivity is only present in digital art: the work of Brazilian artists such as Lygia Clark and Helio Oiticica, who subvert modern notions of authorship, work and fruition through several interactive and multi-sensory experiments, also follow in that direction, as well as many others who appear by the end of the 50's and beginning of the 60's of the 20th century. It is not coincidence, however, that the poetics of Clark and Oiticica take place in a Brazilian context, a culture that has never been Gutenbergian –unified by radio and popular music, Brazil was and is still marked by strong traces of oral culture. At the same time, it is not possible to ignore the advent of television when one thinks about the out-centering of the artistic circuit represented in the dialogue performed by Clark and Oiticica from an outlying country, or in the return of world images in pop-art, or even Nam June Paik's performances and video works.

However, what is then being outlined brings already the marks of what will be molded by the digital support. The dream of sensory fusion originated from technological possibilities goes back to Castell. The inventors of color-music apparatuses in the 18th and 19th centuries, and even Scriabin, already in the 20th

century, have been faced, it is easy to imagine, with incipient technologies for the implementation of their synaesthetic aspirations; while adhering explicitly to the dynamic and logic of modern world, futurism also sustains the dream of synaesthetic experience out of the possibilities to be created by technology. Thus, it is natural that artists such as John Whitney or Ron Pellegrino, who, through different ways arrive to the concept of visual-music, see, already in the 60's, digital technology as a tool to liberate poetics until then incomplete.

Digital processing, since its beginning, has been a means to duplicate and simulate – we could even say: clone – reality, as a way of foreseeing, anticipating, understanding and controlling it. It becomes also a means of expanding such reality, but this expansion corresponds to specific modes of perception and representation. When we take, for instance, vision automation procedures developed for military use after the Second World War, we can notice that three-dimensional analysis of image will be implemented through the information of a flat image generated according to the codes of perspective, plus the data supplied by a radar sign which touches the object and returns to the device, allowing space calculation (Manovich, 2002). When mixing vision and touch in a perspectival space, we are back to the model vision practiced in the 18th century.

But the flood of digital images and works in the last decades mark also the return of three-dimensional and acoustic spaces, in a vast number of works involving virtual reality and three-dimensional immersion environments – frequently filled with sounds that reiterate space illusion. However, the connections between synesthesia and the digital culture go even beyond.

While codifying all senses from a common mathematical code, we are back to Pythagorism. Thus, it is not surprising that John Whitney's digital harmony will mix colors and sounds out of mathematical proportions of musical harmony, whose origins go back to Pythagoras. Or that Ron Pellegrino prepares a laser and sound animation set in explicit dialogue with the Pythagorean tradition. Translation of

data of a sense in terms of another ones through the mathematical mode of an algorithm can be found in a vast number of software, interfaces, corporal sensors or environments of immersion, which aspire for different synesthetic registers. As a result, they point to the type of *nowness* experience that we have just defined. Its non-linear character stands away from the qualities of verbal thought, its temporariness is circular. Even in virtual reality games, which have narrative aspects, the immersion character of experience is still the most decisive.

Digital culture has rendered the world a remarkable acceleration. Those we call environments of immersion are just distinct spaces within a larger environment of a planetary culture in which we are more and more immersed in the instant: the notion of historicity dissolves in the circularity of the synaesthetic instant; the experience of narrative time and contemplative visual space dissolve in sensation. We are, again, in a magic world, where every kind of metaphors and mythical spiritual discourses of our experience emerge – Roy Ascott's shamanism, or Erik Davis' tech-gnosis are only two among many examples. These aspects, broadly synaesthetic, of our contemporary experience, are what I call digital perception.

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