

METAMEDIUM (THE EXPANDED ALAN KAY)

Helder Dias

Considering the informational lines that cross the Human and the machinic, it becomes imperious to re-design the theory of new media around these facts. It's not enough to analyse the 'remediation' or to consider cinema as privileged precursor. The theoretical work shall be placed to a more general level and implies that the notion of mediation is understood in all its meanings.

Introduction

In the domain of biology and more specifically in the theory of evolution, we can define the extended field of conception as the totality of viable virtual paths that a certain evolutive stage can follow. As a classic example, all the books that can be written using the total possible combinations of the alphabet that produce words and sentences which make sense [1]. One of the actualizations of this extended field of conception is, for example, the tale where the author describes this process.

This brief introduction allows us to place this problem. Over the last decades, deep scientific explanations presented the biological and the psychological as the result of algorithmic systems. As an example, we can refer the evolution as a blind Darwinian algorithm [2], its cultural '*memetic*' extension [3, 4], the computational theory of the mind or the investigations around AI.

An extremely interesting fact, and not always explored in this context, is that also computers are algorithmic machines by excellence. The general knowledge of the outside world as a manifestation of an algorithmic system, associated to powerful computational iterative manipulators, allow us to delineate a space of research whose crossings generates new Human definitions of the 'so-called Human' [5].

The theoretical work shall be placed to a more general level and implies that the notion of mediation is understood in all its meanings. The nature, body and mind, are today seen as spaces of mediation so, a theory of new media, is forcibly a theory of the *meta-processes* that allow, feed and confer dynamic to the manifestations of design out of chaos. With or without the help of the mind. With or without the help of the computer.

Advances in science have resulted in the expansion of reality. For example, microscopes allowed us to know that, at an atomic scale, beyond the limits of our vision, there is a core of activity that sustains, articulates and helps to explain the permutations of that same reality. It is an epistemological change of extreme importance the one that is implicit in this recognition that there are limits to our capacity of perception and apprehension of reality through the senses. The importance is not limited to this finding, but also to the verification that many phenomena that surround us are made from these scales to which we have no access except by means of technical devices increasingly more complex.

Ultimately, this lack of access to these scales is a kind of standing invitation to an increasing reductionism even if, as experience has taught us, not always a full understanding of the phenomena is easier when they are reduced to its most essential components.

The past decades have highlighted further this divide between what we see and what we think it exists. To the molecules, atoms and elementary particles it was added a central element - the *bit*. The world around us is increasingly presented to us as a discrete, informational, storable and computable one. All this requires an even wider set of prosthesis to help us navigate and negotiate the meaning of that same reality, now composed of a multiplicity of information flows. We do not only refer to the prosthesis widening of the senses, but to the massive and distributed presence of computing devices, that help us cognitively by guiding us, filtering all consumed information, warning us.

Of course this view also has as a counterpoint, the open possibilities in terms of monitoring, quantification of the subject, control of unpredictability and calming of desires. Once again the analysis of technological development is organized between utopia and dystopia.

In short, it is indisputable that there is an increasing complexity in our relationship with reality, where the amount of information and stimuli produced involves the use of devices that render in some way, and supplement the limitations of our cognition. It is no longer just the sensitive flows that extend beyond the limits of our senses, it is all an informational machine that far exceeds us and apparently begins to dispense our actions. Where the first devices opened windows to the World because they broadened the reality, the seconds, computational, reconstruct and simulate that same World at the same time offering themselves as a model to explain it.

Metamedium

“Although digital computers were originally designed to do arithmetic computation, the ability to simulate the details of any descriptive model means that the computer, viewed as a medium itself, can be all other media if the embedding and viewing methods are sufficiently well provided. [6]”

Since the dawn of computing that seems to exist a dispute between the will to create a computer system directed to the universality and the difficulties inherent to the areas that do not manifest themselves as computable. This dispute had its push with the pioneering work of Alan Turing and his proposal of creating a computational machine, itself universal.

With hindsight, we can observe and highlight these two trends. The first one, already mentioned, the general attempt to host the real within the computer, and a second, related to the need to introduce increasing levels of abstraction that enable us to generate lines of communication needed to implement such a project in expansion.

Decades later when Alan Kay defines the term ‘metamedium’ the author presents the computer as an active simulator of all existing media and others to be established. Through the prefix *meta*, Alan Kay also ends up recognizing the need to increase the level of abstraction to find a common substrate where the various media may relate.

The *digitalization* of information and logical formalization of algorithms capable of replicating in the digital, operations hitherto circumscribed to the Human sphere, paved the way for a set of experiences that would redefine the problem of mediation.

In the interplay between algorithms and computing resided the possibilities of logic formalization and mechanic simulation of various fields such as biology, where blind algorithms mixed with evolutionary systems generate a design endowed with growing complexity.

It is for this reason that for the last three decades, the duality code-computation has become increasingly central in the analysis of diverse issues around the notion of humanity and in the appreciation of the dynamics that animate our interaction with the reality that surrounds us. The way the computer makes the code operable, sets up oppositions about their role in the general construction of the World.

We are among the authors who question computation not only as a metaphor, but as the effective way the World works in general, and works where computing emerges as active mediation, such as simulation and as a metaphor, but where it is recognized a irreducibility and a logical impossibility of formalizing the entire physical universe, culture and functioning of the mind.

Following these two pathways, it raises notions of extreme interest like the opposition between continuous and discrete, the problem of *digitalization*, the rationality and logic against the limits of computing or the increasing quantification of the subjectification processes associated to an economic system of attention [7].

In short, the expansion of the original formulation of the notion of metamedium is done in two directions, both underpinned by the duality code-computer: The first is *ontological* and the second *phenomenological*. In both cases we overcome the problems of simulation of the various media, to start looking at all of reality as mediation or its construction as the update of a complex set of algorithms.

It is essential to discuss the code and the computation because then you can draw conclusions about the current state of mediation and review concepts such as central interface, representation, simulation, emergency or unpredictability. Whether our focus directs more to the phenomenological problem of mediation, whether our interest focus more on the ontological question of production, we should question the recent theoretical proposals centred on the code, on software and computation, starting by reviewing some concepts that are interlinked:

- **Information.** Today we produce and consume massive amounts of information. The world continues to be presented to us increasingly as information: DNA, memes, information theory, and computational theory of the mind. On the other hand, the digital information is based on a process that involves making discrete sensitive flows, apparently continuous. The expressive richness of these various flows must be described by zeros and ones, which means the entry into action of a segmentation process.
- **Algorithm.** The information may be subject to change, processed, according to an algorithm. Science cut out reality and was able to extract clear rules on its functioning. Overall this is a system of growing abstraction that allows us to logically formulate procedures for the settlement of a given problem.
- Both information and the algorithm can be converted into **code**. These codes may have different objectives: to communicate, clarify or hide [8]. The same algorithm can be implemented using different programming languages.
- Finally, **computation**. The information available and the changes that can be produce through the formalization of algorithms imply that they should be counted in some way. We must not forget that the notion of computing is not limited to modern digital computers and can be scattered and be implemented in different ways.

In short, non continuous reality converted into information on which we can formalize algorithmic modes of operation, lends itself to be integrated in various computing devices that go by the name of computer (mobile phones, iPads, laptops, etc). All this because we have more and more computing power available in more places and scattered by surrounding objects. The process requires an input (a world of flows that can be converted into discrete elements), an algorithm (which structured in the form of code will guide the processing form) and an output (a significant return to reality).

The functioning of today's computers is based on a layered system, where the level of abstraction varies linearly. Level change, from top to bottom, is equivalent to moving away from natural language towards the digital world of zeros and ones, translated into electrical variations. In the reality that surrounds us, and in which the computational mechanisms are increasingly operating, there is also a similar stratification where the juxtaposed layers line with continuity the discreet components of the matter. Understanding this apparent structural proximity allows us to articulate the two fundamental observations regarding the functioning of the code and the computation.

The first analysis results from the fact that the discreet formation of both entities (reality and computing device) feeds, via the code, transversal computing cross-links and agencies. The consequence of this possibility of integration goes through a further and radical technical rigging of the sensitivity and for the construction of a reality on demand. As mentioned, a phenomenological problem added to the strangeness, the risk and unpredictability. An active and strong mediation.

The second approach runs deeper. It is not enough to articulate and highlight the presence of computation in mediation and the phenomenological appearance of what surrounds us, but to recognize it as a major element. Powered by the scientific view, the reductionism and the simulations, the computational views of the world seem increasingly strengthened. It is important to analyze this version that uses the computer system as a model of operation and see if there is something new in this association or whether it comes in the wake of other historical moments in which certain technical devices, such as the clock, also served as an explanatory model for the functioning of social and mental systems.

The notion of metamedium, starting from the base formulation which was given by Alan Kay, lends itself to serve as a tool to analyze how the overall computing has evolved Lev Manovich [9] draws attention to the fact that the generation of Alan Kay was responsible for the union between simulation (Turing's initial concern was the creation of a computing machine that was capable of simulating a wide range of other machines) and the media. A union that would receive an added impetus with the advent of graphical interfaces in the 80's. The consequences of this approach are extremely important because they mark a divide between the computational aspects and its expression. Over the past 30 years, the stratification of computing gradually hid the construction of the simulation through the code and changed our relationship with a computer in a more focused experience in the media. This transformation has been so significant that Douglas Rushkoff [10] uses the following expression: *Program or be programmed* to draw attention to the fact that, despite having more computing power available in ever more devices, we haven't built skills that allow us to manipulate the codes already established and that come to us in the form of software.

Conclusion

In short, today's review of the notion of metamedium can be very fruitful. On the one hand, because we can see more clearly how the computing rhetoric has installed itself in contemporary culture and how it

has produced clear reflections on the social organization and processes of construction of knowledge. On the other hand, beyond this more hidden presence computation continues to strengthen a mindset that sees the world as a metamedium, where algorithmic expressivity serves as an explanation for a wide range of complex phenomena ranging from the social to the mental functioning.

For everything that was said earlier, a theory of new media cannot focus only on the way the evolution of computing produces different 'remediations' [11] and new media landscapes. A theory of new media, present and active, requires the inclusion of the problem of simulation and computing as essential aspects of this field of research.

As we have said earlier, the nature, body and mind, are today seen as spaces of mediation, so a theory of new media is forcibly a theory of the meta-processes that allow, feed and confer dynamic to the manifestations of design out of chaos. With or without the help of the mind. With or without the help of the computer.

References and Notes:

1. Jorge L. Borges, "A Biblioteca de Babel", in *Ficções* (Lisboa: Editorial Teorema, 1998), pp. 67-77;
2. Daniel Dennet, *A Ideia Perigosa de Darwin* (Lisboa: Temas e Debates, 2001);
3. Richard Dawkins, *The Selfish Gene* (Oxford: Oxford University Press, 1989);
4. Susan Blackmore, *The Meme Machine* (Oxford: Oxford University Press, 1999);
5. Friedrich Kittler, *Gramophone, Film, Typewriter* (Stanford: Stanford University Press, 1999);
6. Alan Kay and Adele Goldberg, "Personal Dynamic Media," in *The New Media Reader*, eds. Noah Wardrip-Fruin and Nick Montfort (Cambridge: The MIT Press, 2003), pp. 393-404;
7. Jonathan Crary, *Suspensions of perception*, (Massachusetts: The MIT Press, 2001);
8. Casey Reas, *Form + Code*, (New York: Princeton Architectural Press, 2010), 11;
9. Lev Manovich, "Alan Kay's Universal Media Machine", 2006, www.manovich.net/DOCS/kay_article.doc (accessed May 10, 2010);
10. Douglas Rushkoff, *Program Or Be Programmed*, (New York: OR Books, 2010);
11. Jay David Bolter & Richard Grusin, *Remediation, understanding new media*, (Massachusetts: The MIT Press, 1999).