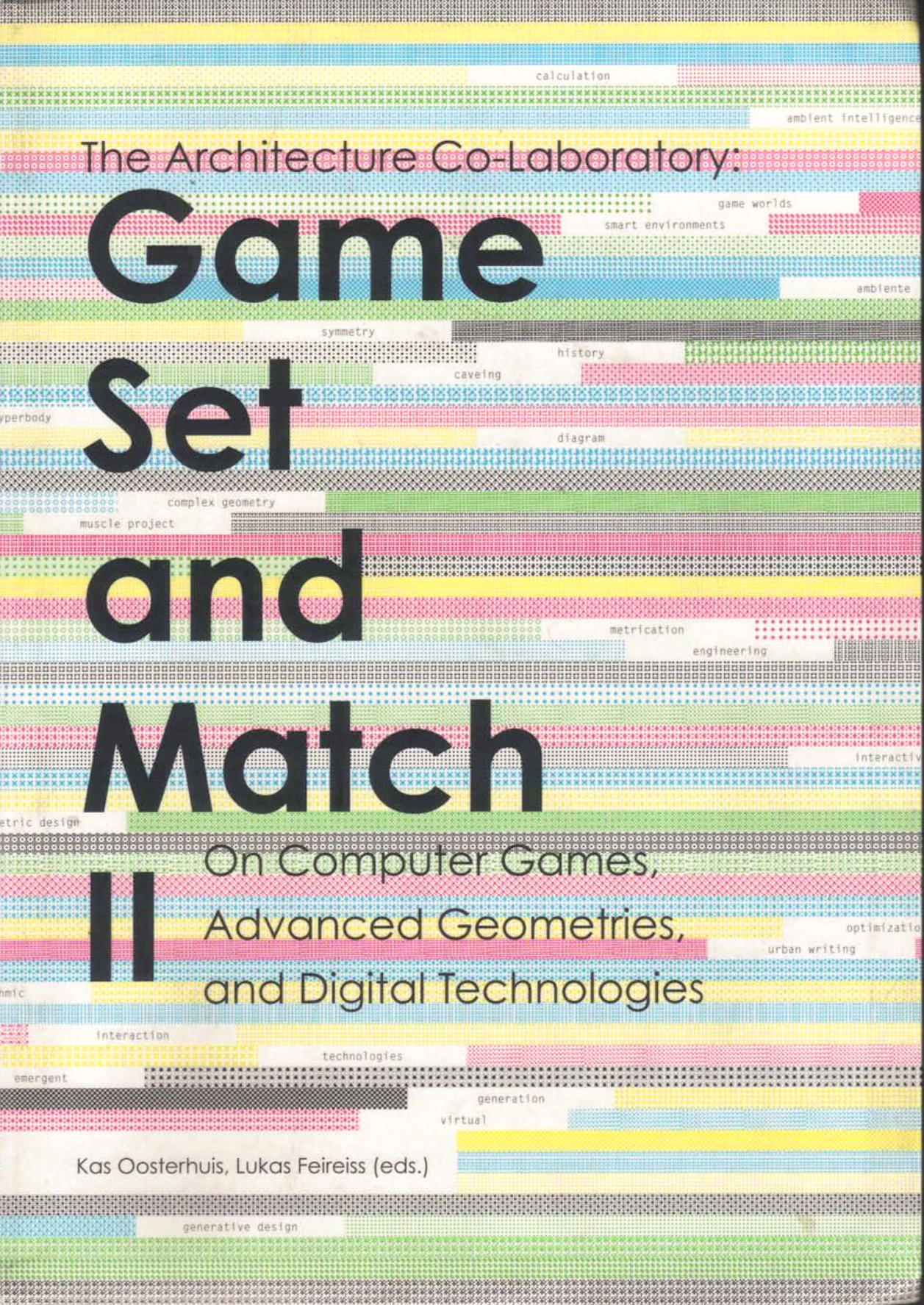
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The Search for an Information Space

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The mental landscape

This essay poses the following question: how can an information space be thought up, conceived and created? This question entails two preliminary considerations that are necessary to clarify before delving into the reasoning behind this essay.
The first consideration, which will be pretty obvious to many readers, is that the conception of space varies from one period to another.
Space does not exist as an objective datum, but it is a mind-set that often presents scientific traits while sometimes it is a sheer symbolic form. Often, as exemplified by Erwin Panofsky, it is both things at once. The way of representing and getting to know space varies from one period to the next: for instance, Euclidean flat space, Cartesian three-dimensional space, Gauss's curvilinear geometry, Riemann's 'n' dimensional geometry, Poincaré's topological geometry, etc. The mental and scientific forms of representing space may take on a utilitarian value. We use them if they work; we cast them aside if they don't work. Euclidean geometry is more than accurate if we wish to undertake the parceling out of an agricultural area, but we need another if we are to measure the curvature of the sunrays. The different space conceptions do not necessarily cancel each other out, but, just like photographs taken from different angles, they offer different interpretations of reality.
Nowadays, we are living in a multi-dimensional space, first and foremost because we have many lenses through which we can view reality. We can use a lens with a focus created many centuries ago, or we can use one of today's and then go back to one of yesterday's (and, as we will see in this essay, even imagine one of tomorrow's). Each image is truthful to a certain extent, even though its strength, power and ability to be meaningful in this day and age are of course very different.

A computerisable space

Now we have to take a step forwards. The conceptions of space, especially those with a scientific base (but not necessarily those alone) become 'reified,' that is, they 'become concrete things' through architecture. Generally, we think of architecture independently from the conception of space that generated it, as though there was an 'absolute' space where one can find architectures coming from extremely different periods. However, architectures are not natural objects, they are artificial constructions: they depend upon the mind-set of space. Do we need any examples? Take a look at Egyptian pyramids. Isn't the pyramid the concrete result of some notions of geometry and trigonometry? O rather, without those notions, without those mind-sets, the pyramid would not even be conceivable. If the mind-set of a Triangle did not exist, how would it be possible to create a pyramid? Isn't the Pantheon the result of an extremely advanced geometrical calculation, a way of conceiving space and calculus in terms of 'geometry,' that is something the Romans had obviously got down to a fine art (as they never would have been able to build those types of buildings with their abstruse numbers)? And let's give the finest example by looking at the way the new architecture caught on at the start of the15th century. Isn't the invention of perspective at the basis of the architecture of Humanism? It is the very same perspective, the scientific conception that finally makes space 'measurable' from a perception point of view, leading to the creation of an architecture made in its own image and likeness. The architecture of Humanism is modular, proportioned, composed of repeatable and knowable elements; in other words, it is especially made to be *prospectivised.* Lastly, doesn't the 'mechanical,' abstract, analytical and, above all, objective concept behind the industrial society find its reification, its expression into new rules of architectural space in the functionalist architecture (and especially Gropius' architecture dating back to the mid-1920s)? Let's not forget the two premises we have just discussed:

1 The conception of space is a mind-set that varies from period to period;

2 The different mind-sets of space find their own concretisation in architecture.

The key role of information

We are going to make a transition now. In the first part of the text, we have seen that, right at the center of the development process of architecture there is 'our own mind-set of space,' that is, the mental depictions of space that succeeded one another throughout the various historical periods.

Now, the architects of the new generation, those whom we have defined as 'Born with the computer,' for the past few years have been striving to understand how the dynamic, interconnected and changeable models representing the heart of information technology revolution are able to transmigrate into an architecture that is their reification and represents their concretisation. Information is the water, the essential element of this research and takes shape through the dynamic and interconnected structures of the scientific models of electronics.

If the concept of mechanization (in its various aspects of analytics, objectivity, abstractness, seriality, consequentiality) was at the basis of the space model of the functionalist architecture in the 1920s, then the concept of information is and cannot but be the horizon of this stage of architectural research.

Therefore, let's try to get a better understanding of 'what is information?' 'Why is information the essential element of this stage of architectural research?,' and, finally, 'why is information the mental landscape of architects of the new generation?' The word Information is so important in this day and age that it has acquired more importance than the word 'Mechanization,' which was the buzz word up until a few decades ago. In an article entitled 'L'informazione Materia Prima dell'Architettura' (Information as the Essential Element of Architecture), that is published in the magazine *Op. Cit.* (September 2003, no. 118), supervised by Renato De Fusco, and online available only in Italian, http://architettura.supereva.it/coffebreak/20040318/index.htm. I discussed the issue at length, and hereby I shall simply outline my conclusions.

Of course we all know that Information is at the very base of the post-industrial society. It is its economic wealth, its source of power; it creates the field where it all comes into play. This concept, after being clearly outlined for the first time by Alvin Toffler in 1980, in his *The Third Wave*, is now fully understood. The fundamental connection we should be aware of is that electronics is the highest and most complex conventional system ever implemented by man. In the electronics field, the only objective datum is the on/off, in other words, the presence or absence of electrical energy. Starting from this one objective datum, in electronics everything exists only through a 'conventional' action. (Let's look at an example. If I write a '0' on a piece of paper, can I ask myself: 'what is that '0'? 'However, if in a traditional context, by looking at a '0' written on a blackboard the question 'what is that '0'?' is legitimate, in an information technology context, that same question doesn't make any sense. Indeed, in an information technology context, it is necessary to have already conventionally decided whether that '0' is a letter of the alphabet, a number, a series of points, a mathematically described geometrical shape, the projection of a three-dimensional shape and so on.) This line of thinking leads us to the statement that 'In information technology, there are no data but only Information.' However, if in information technology there are no data but only information, 'in information technology, it all is information!' It seems like play on words but it isn't at all.

This formulation gets to the heart of the matter and takes into account the fact that the information is truly 'in formation': in a constant, dynamic, inexhaustible state of movement and transformation! Thus, the information is a fluid mass that 'still' has to take shape and Zingarelli (a very popular Italian dictionary, but perhaps the etymology is similar also in English and perhaps in German too): 'to inform' means to 'shape according to a form' and 'information' is 'the result' of this shaping (Nicola Zingarelli, *Vocabolario della lingua Italiana*, ed. decima, Zanichelli, Bologna 1970)

And from this stems another formulation. If in information technology, it all is in formation, 'the taking shape of the information can be defined as modelling and it finds its expression in the creation of models.' Hence the model is the 'shape taken by the information,' the shape in which the information is 'modelled.' Of course, in this context, the meaning assigned to the term model is the scientific one of 'Theoretical pattern elaborated in various sciences and disciplines in order to represent the fundamental elements of one or more phenomena or entities.' (Zingarelli cit.)

Therefore, we are referring to a mathematical, statistical, physical and economic model.

In information technology there are many categories of models and we have dealt with them on several occasions, however, the simplest one is the one represented by the electronic spread sheet that links all the information to one another through mathematical formulas and thus enables the constant update of all values at the slightest variation of even one single piece of information. This invention has had its impact in an extremely wide array of activities: from the financial to the construction sector. Above all, it has paved the way to a generalized line of thinking 'What...if' (What happens to my model If one varies the cost X or the quantity Z in all the parts that are dependent on it?). For quite some time there have been 'space and architectural' models that dynamically link the geometrical, space, constructional and even performance-related information so that, at the slightest variation of a datum, it is possible to check in a 'cascade manner' what happens to all the information interconnected in the project system. (Gehry's Disney Auditorium – which has finally been completed in Los Angeles – is based upon this very same model type.)
In this context, a project tends to function like a series of equations representing specific sub-areas of the project. No specific shapes are being designed, but 'categories of possible shapes' that may vary within certain parameters: they replace the geometry of Euclidean absolutes with topological categories. Thus, the design and conception of architecture revolves around this network of fluctuating and moldable information as though they were a system of interconnected equations exchanging information with one another.
This idea of information as a dynamic, interconnected and constantly evolving structure is the core of the mental landscape of contemporary architects also because it is closely connected to a crucial feature; interactivity. I have dealt with the subject of interactivity in great detail in the past and I cannot tackle it in this instance, however please refer to the volume of *Architectural Design* (Jan/Feb 2005, vol. 75 no. 1) or to the article 'Neue Subjektivität: Architektur zwischen Kommunikation und Information,' online available at http://www.a-matter.de/digital-real/ger/main.asp?es=2.

Interactivity and time

We have now come to the last set of considerations, which are somewhat the most complex too. Interactivity is associated with Time which, as Albert Einstein himself wrote, is the only way to say something sensible about space. I have discussed this in the article 'Tempo prima dimensione dello spazio' (Time as the first dimension of space) in *Il Progetto* (The Project) no. 19, available online, in Italian only, http://arhitettura.supereva.com/coffeebreak/20041125/index.htm.
If we use time as a means of understanding space, we will discover something very effective. The jump rule prevails from one reference system to another, that same jump that underlies hypertextual systems.
If I live in and know only a two-dimensional system – imagine a curved sheet of paper – in order to travel across a space from one point to another I follow a route equal to T. Even by curving the surface to a great extent, T will always have the same length. However, if I look at this curved sheet of paper from a three-dimensional world, I will immediately realize that A and B can be linked not only by segment T but also by a far shorter spatial vector 't' that travels or, rather, *jumps* across the three-dimensional space.

Interactivity in buildings can mean not only varying configurations and spaces according to changes in wishes or external input, but also creating different systems of spatio-temporal reference. If an interactive system modifying architecture is linked to Internet-based navigational systems, the effect of the jump can pervade the whole of architecture: a jump from one spatial configuration to another, a jump between different information systems and, finally, a jump between different temporal states. Associated with window interface systems, real-time navigation systems, remote depiction systems with naturally interactive, hologram-based systems (a brief step forward that will shortly be made), the great world of the Internet can form an incredible 'thickener' and multiplier of spaces and times. We can have windows open at the same time on worlds far away from each other, and literally jump from one to the other: live in them, try out accelerating or moving spaces, show and be shown, and all this in real time and in a continuous jump from one world to the other. The Internet is a necessary tool for architecture in this stage of research, not only because of its pragmatic aspects, but also for its cognitive ones. As we learn more, we shall understand how a fundamental formulation takes effect through the Internet and interactivity: from a lower system, we can have the projection of one at a higher level. This formulation means that it is possible, although physically located within fixed three-dimensional spatio-temporal limits, to have ideas about a space with more dimensions than our own, and to use, imagine and, to some extent, understand it; even to design this multidimensional space.

The technological prostheses and the conclusion

Let's take one last step. Man has a developed mind and has created a series of instruments that have broadened his own conception of space and time (think of Galileo's spyglass, for instance). In the last few decades, progress has been prodigious and now man can provide himself of real technological 'prostheses.'

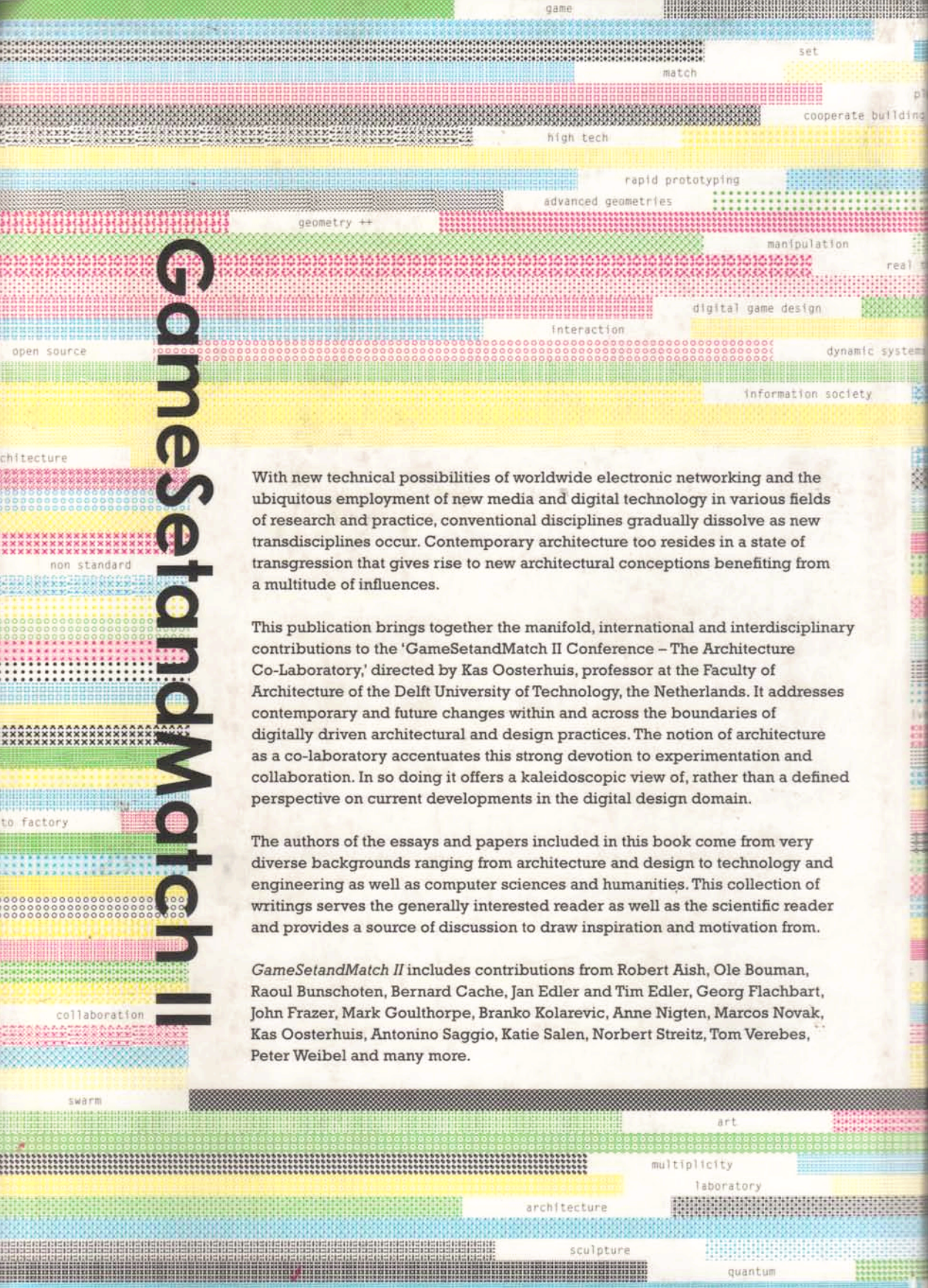
As we know and have already discussed, the Internet is one of the most powerful of these prostheses. The Internet space breaks the conventions of a three-dimensional space because it reconnects and reunites multiple worlds by making them contemporaneous and reachable.

What many are working on and I hope will still be working on is an idea of 'intimately' electronic space, an information space seen as an essential element of this stage of architectural research through a conscious, critical and creative use of our technological prostheses. It will be a space with more dimensions than we are used to because time 'plays' a different role compared to the three-dimensional one. It is a world where the image of the 'jump' from one world to another will be decisive. It is a world of coexistent, autonomous and, at the same time, permeable systems. A world where 1) a new mental landscape, 2) a computerisable space, 3) a key role of information, 4) Interactivity and time and 5) The new technological prostheses will play a crucial role.

And now let's ask ourselves: is it not by working in this same respect that we can finally understand how to formulate an Information space? A space that can be continuously remodeled, naturally traveled, that is naturally hypertextual and interactive and that can be navigated through jumps?

The challenge is how architecture, 'as a means of concretisation' of this mental landscape that we already know, should completely transform itself in order to be computerisable. In other words, how architecture can consciously take on this new information dimension. And how this new consciousness may be combined with the highest crisis, which is the aesthetic one.

Transparency used to be the catalyser found by the Functionalism of the 1920s in order to objectively detect a new way of knowing and thinking and to create an architecture that was at the same time mechanical, abstract, sensible and objective. Will we work around the concept of trans-appearance, dynamic overlapping, fading of worlds and shapes? Will we make sure that, through these new concepts, we may pave the way to knowledge of the information space? The search is on.



GameSetandMatch II

With new technical possibilities of worldwide electronic networking and the ubiquitous employment of new media and digital technology in various fields of research and practice, conventional disciplines gradually dissolve as new transdisciplines occur. Contemporary architecture too resides in a state of transgression that gives rise to new architectural conceptions benefiting from a multitude of influences.

This publication brings together the manifold, international and interdisciplinary contributions to the 'GameSetandMatch II Conference – The Architecture Co-Laboratory,' directed by Kas Oosterhuis, professor at the Faculty of Architecture of the Delft University of Technology, the Netherlands. It addresses contemporary and future changes within and across the boundaries of digitally driven architectural and design practices. The notion of architecture as a co-laboratory accentuates this strong devotion to experimentation and collaboration. In so doing it offers a kaleidoscopic view of, rather than a defined perspective on current developments in the digital design domain.

The authors of the essays and papers included in this book come from very diverse backgrounds ranging from architecture and design to technology and engineering as well as computer sciences and humanities. This collection of writings serves the generally interested reader as well as the scientific reader and provides a source of discussion to draw inspiration and motivation from.

GameSetandMatch II includes contributions from Robert Aish, Ole Bouman, Raoul Bunschoten, Bernard Cache, Jan Edler and Tim Edler, Georg Flachbart, John Frazer, Mark Goulthorpe, Branko Kolarevic, Anne Nigten, Marcos Novak, Kas Oosterhuis, Antonino Saggio, Katie Salen, Norbert Streitz, Tom Verebes, Peter Weibel and many more.