

# Hybrid Design Environment

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*This paper discusses some preliminary ideas concerning new design environment or environment of designing. Main thesis of this paper is that process of creation and perception of architecture proceed between Real and Virtual. Architecture is created by analog and/or digital media. As the result we have the multitude and diversity of spaces and tools. Defining these terms is important for understanding a new process of design and a new space of designing. It gives us possibilities to create the new design environment, in which creation of architectural form may be considered as an integrated process connecting the analog, the digital, the real and the virtual. Architectural space, as we know it from physical environments, is supplemented by a virtual space. Physical, architectural and virtual spaces share very similar features in simulation. In virtual models, the boundary between the representation of physical sites and imaginary, virtual sites is vanishing rapidly, resulting in a new reality.*

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## Preface

Designing is a manipulation and integration of many different factors: aesthetic qualities, functional and organisational issues, formal propositions, contextual, characteristics of place, spatial qualities, tactility and materiality, environmental consciousness, architectural language and expression. In many theoretical considerations about designing the necessity of co-existence between and, most importantly, the transition from theory to practice; from thinking to making, from poetry to plumbing, from concept to construction, from idea to building, from the imaginary to the real, was discussed. Tschumi wrote: "Indeed, architecture finds itself in a unique situation: it is the only discipline that by definition combines concept and experience, image and use, image and structure. Philosophers can write, mathematicians can develop virtual spaces, but architects are the only ones who are the prisoners

of that hybrid art, where the image hardly ever exists without a combined activity." (Tschumi, 1994)

## Why Hybrid Design Environment?

Searching for new space of creation is reflections of the ever present strive of humanity for unification and unity, for the creation of TOE – Theory of Everything. Especially recently, more and more works stressing the need to constitute the Entirety have appeared. The situation results from the disappearance of the attractiveness of progress and the inevitable dying out of the attractiveness of the new in connection with progress. In the constant search for the new we have reached a moment in which we have come to understand that without a moment of reflection, a change for change's sake does not make sense. Entirety becomes an alternative for the new. Entirety can also be made of something that belongs to the

past as the new and the old are equal. An important aspect in the creation of the Entirety is the fact that one cannot be a passive participant of the Entirety. It required involvement. The continuation of Entirety means participating in it and entering new spaces.

The need to create a new entire space of designing is based on the thesis of a dual spatiality of man. Living in two time and space continuums: the virtual and the real. These two different areas of human activity and, at the same time, images of its world, overlap. If our designing activity takes forms, which are identical to the activities in the real space, then this space is perceived as nothing but real. As Hall (1976) has said “the way we perceive a given space is determined by what we can do in it”.

When creating a Hybrid Design Environment, we start from the synthesis of different means of conveying the image, making use of real objects, traditional media. As a result of such actions, which assume the free use of all sorts of different elements, we obtain an environment of not just an intermedia character but also of a multimedia character – a unimedia synthesis.

The fact that communication techniques have been assigned the dominant role in creating changes in the shape of culture, initiated by Inis at the turn of the 1940's and 1950's and later developed by McLuhan, has led to giving the computer media the dominant role. “The computer gives you the possibility of constructing objects that you would never do directly from the mind to the hand (...) It is still necessary to think, to see in three dimensions because architecture in the era of the media and images must respond with effective spatiality and corporeality in terms of space.” (Eisenman, 1997)

New computer techniques give us opportunities to change our thinking about architectural designing. It results from the difference between the computer and the human mind. The computer is discreet. Mind is analog. These facts define the

problem with connecting. Something between is needed. The main thesis of this paper is that the process of creation and perception of architecture proceed between Real and Virtual, Analog and Digital. Architecture exists between the Real and the Virtual worlds. Architecture is created by analog and/or digital media. As we see, at the same time we have the multitude and diversity of spaces and tools. Defining these terms is important for understanding a new process of design and a new space of designing. It gives us possibilities to create the new design environment, in which creation of architectural form may be considered as an integrated process connecting the analog, the digital, the real and the virtual.

## **Elements of the Hybrid Design Environment**

### **Digital environments**

“VR is a digitally generated, visually, acoustically and tangibly a multimedia environment, (...) which surrounds the human body, supplying it with artificial sensorial impressions (...). Systems of virtual reality are based on interactivity in the sense that the computers producing a simulation of the surrounding, in which the human is emerged, still transform the environment in accordance with the reaction of the human, (...) Virtual reality is a medium which stimulates the feeling of presence owing the use of modern technology.” (Lanier, 1995)

The visions of the mind take on shapes, which change as we wish almost simultaneously with our thinking. It is possible to work with VR by taking advantage of the possibilities of introducing the contents of the broadened mind and sharing one's product of the thinking process with associates. VR makes it possible for people to meet and work together in virtual communities. (de Kerckhove 1995) VR has added a new meaning to the notion of space. The architectural space as we know it from physical environments is supplemented by a virtual space. In VRML models, the

boundary between the representation of physical sites and imaginary, virtual sites is vanishing rapidly, resulting in a new reality. (Schmitt 1999)

The illusion of physically being inside a virtual space is wonderfully disorienting. As a three-dimensional space for visualisation the three-dimensional digital space, a VR would seem perfect for architectural exploration. It allows one to enter, through the monitor screen, into the "computer world", where an interaction with the forms present there is taking place. It turns out that apart from these virtual forms nothing else exists. Designers and users of the world, which they have created by receiving new experiences and new means of interaction, become a new generation of the inhabitants of cyber worlds. Architecture starts to exist in different dimensions.

### **New methods of designing - Direct Design**

In traditional designing we used to work in a two-dimensional space, whereas in virtual space we are dealing with 3-D. We can create spatial forms filling the VS with all sorts of shapes, keeping the maximum interactivity of the creation process. There are no obstacles in designing in Virtual Space – a space that is a full-scale space – by transforming the elements of the form. ". With the currently available Virtual Reality technology, it is possible to build a design system that allows a full three-dimensionally. (...) The experimental system allows the user to experience new 3D-interaction techniques, e.g. modeling-, manipulating, orientation and navigation techniques while being immersed in a "virtual" design space." ([www.uni-weimar.de/~donath/teach-research98.htm](http://www.uni-weimar.de/~donath/teach-research98.htm))

### **Traditional tools**

The main traditional tools of design are the sketch and the scale models. Sketches best correspond to the specifics of the future object search form, due to quick materialisation of the idea invented. The history of architecture provides evidence that graphic techniques used in the creative process

of design were an inseparable component of the whole process itself. A drawing plays the role of a catalyst. With its help the visual pictures formed within the architect's mind change and become more precise. Simultaneously as a feedback, drawings reflect our memory, complementing spatial pictures already conceived in it.

At the same time, many designers prefer to present their ideas through scale models. Such method of design influences the character of form to a larger extent than when using a drawing. The image of the designed object (formed within our memory as a sequence of visual pictures) is immediately preserved as a scale model. That influences the character of a form and shapes it out. (Asanowicz, 1997)

### **New tools**

3D digitizer is one of the tools, which make it possible to connect the digital and the analog. When we use it "Architectural form - as Burry (1996) wrote - may now be experimentally moulded or carved using manual techniques in close association with the computer. At any stage a model can be mechanically digitised and translated to a computer database for explorations that go beyond simple physical manipulation. In the virtual environment, the resulting forms can be rationalised using an ordering geometry or further de-rationalised."

Similar results can be obtained using a 3D scanner. The transposition of the digital spaces of spatial forms makes their later transformation possible. It is possible to scan not only the hand-made models but also other forms, such as a squashed box or a leaf, which then become the inspiration for creating a purely architectural form. As a new output in designing the rapid prototyping systems can be used. Three dimensional printing makes it possible to have an immediate materialisation of the virtual form which can be subject to manual modifications and, furthermore, to scanning and transposition to the virtual reality.

## Problems

Nowadays, the Virtual is much more Real than the old Real ever was. The design created in a traditional manner is more virtual than the one created in virtual reality. Hand made sketches represent ideas that are born in our mind and they approach the future reality only. The forms created in virtual space are much more real than traditional reality. They can be perceived from different points of view, at a different time and, what is most important, in the real time. Real time representation is characteristic for creation in VR. We create and simultaneously we can see what we create. It gives us possibilities for the effective use of feedback in the process of creation.

In connection to the above a serious problem arises. For example, we agree that using genetic algorithms in creation of architectural form is a digital method of creation. But Gehry works with scanned 3D physical models. Is it a digital or analog way of designing? Direct Design in VR may be treated as a physical process of building the form. Does Virtual mean unreal? What is the difference between the Virtual and the Digital, and the Real and the Physical?

VR has caused an implosion of space, an elimination of boundaries between the space of realisation and the space of perception. Everything takes place within the same space that is an interactive space. Baudrillard (1975) has made an interesting comment when saying that the media do not reflect reality but serve as machines for “multiplying” images and characters. In relation to the above we can now pose a thesis on the change of the status of reality in the era of information technology. As Baudrillard (1994) has said - reality changes into a “simulacrum” which is the execution of McLuhan’s principle that “the medium is the message”. A notion of a human being extended by the medium appears. The designer is equipped with a never-ending series of artificial limbs. The difference

between the mechanical era and the digital era is that the artificial limbs are no longer something “external” to the body but have become something “internal”. In the mechanical era artificial limbs substituted the faulty human organs. A human being in the era of simulation identified him/herself with its extensions. “All media are the extension of our capabilities - mental or physical. (...) The extension of any sense changes our way of thinking and acting – the way in which perceive the world.” (McLuhan, 1967)

## General Conclusions

A common aesthetic factor in virtual architecture regarding the visual and multisensorial is the new way in which human perception can be stimulated by creating the conditions in which the metamorphosis of form, the immateriality of objects, the paradox of image and reality in illusions and, above all, the unseen aspects of our universe can become perceptible. This is the area of VR in which important developments can be expected, particularly through the possibilities of acting the images of virtual objects or creating a human interface. The architectural exploitation of these new perceptual, cognitive and interactive possibilities has only just begun. Strzeminski in 1951 wrote: “In order to see the new content of the new topic, the method of observation is to be changed.” (Strzeminski 1974).

Virtual images are not only new ways of representation. Their uniqueness is a result of the introduction of a new means of presentation. We are dealing here with a brand new method of the existence of the image and which does not have any analogies in the material foundations. These images go beyond our reality and imply the consequences, going beyond our consciousness. As Baudrillard (1988) said, “We will never have to produce the real again...”

## Detailed conclusions

An effort to create a new designing environments has been undertaken as part of the 5th framework programme of the European Commission, A team under the leadership of Johan Verbeke is working on the application of ACCOLADE – Architecture Collaboration Design – Designing Become a Place, the main objective of which is “to build a bridge between the world of computation and the world of experience”. The new environment should be a combination of new communication technologies, exchange of information and design media. The place to design “should have the following qualities (which are currently still not offered or offered in an inappropriate way by existing technologies)”: informality, preserved differences and variety; effective expression; it should stimulate perception; enhance mutual understanding; keep track of changes and design decisions: real time processing; enabling different cultures and formats; enable multi-locatedness; create project overview.”

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