Computer Design – is there any other way?
Real and virtual input to history of architecture

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Abstract. Paper discusses use of digital techniques to present, create and finally materialize the architectural idea. The authors present short description and perspectives for virtual reality experiments.

Keywords. Architecture; real; virtual; music; history.

Idea and Substance

Analyzing transformation of CAD techniques we notice two stages of software function changing through the years: computer as an effective tool and a creativity generator.

Initiatives of software producers, architects, academics define new areas of computer use in designing. They refer to fields of advanced techniques of modeling, Virtual Reality, creative interactions, integration with Internet and others.

Literature inspired by process of architecture computerization proves, that we miss explicitly in understanding of notions. Each creator develops terms describing his works and methods. Some become established in generally intelligible form. The majority contributes the information noise area. To present our point of view we will classify architectural trends in the table, separating problems of architectural idea and its material form.

Idea of parallel existences of real and unreal world comes from Plato. Even nearer to our interpretation appears opinion of Aristotle, who in homogeneous world differentiated form and matter of thing. Transferring rationalism of Aristotle's philosophical thought on the ground of architecture theory we shall recognize: formal idea of architectural work and its material realization (building, complex, city).

Surveying development of architecture in earlier epochs we observe two parallel planes of creation. For dividing them we purposely used analysis of term „virtual”. In original meaning „virtual” stands for: „created in human mind but probably being able to take form; theoretically possible”; secondarily: „existing only on a computer screen”

Architecture of real thought

„Architecture is an art of building construction and its plastic formation“. Essential aspect of the architectural creation was for ages its utilitarian substance and constructional realism. Buildings less or more sophisticated in form were raised in purpose to certain uses.

Along with development of design tools and building technologies the size, form, aesthetics of projects were changed. The same remained
sense of creation substance. Architectural designs were produced in purpose to materialize them.

Together with introducing the computer as a tool in architectural studio the potential of design techniques get advanced. High ability of computational machines opened way for complicated constructions and forms (structuralism, hi-tech, deconstructivism).

Great progress is visible in these spheres of fine arts, which operate non-building medium. Scenography, graphic art, design implemented computer workshop and creatively developed visualization techniques in fictional scenery. These spheres are related to architecture, however they did not appear for the first time contemporary. They arose from theatrical scenography, movies and three-dimensional trends of plane graphic. From antiquity they built realistic and abstract sceneries using instruments of material media. They created illusions for certain practical purposes. Nowadays they only received new tools to use in old and new fields of activity (theater, holography, digital TV scenography, 3D interface for computer software etc.).

**Architecture of virtual thought**

Works existing “only in human mind”, “theoretically possible” remain inseparable background for architectural idea development. Futurism, representations of technically unattainable spatial objects accompany us from beginnings of civilization. Biblical tower Babel became an archetype for building raised on abstract technical foundations, split from circumstances, although theoretically imaginable.

Typology of virtual thought works embraces different categories of objects. Their common feature appears idealizing certain aspects of reality (function, construction, form). Abstract architectural works boom in Renaissance (Leonardo da Vinci, Andrea Palladio, Giorgio Vasari). They function in following epochs bringing futuristic visions of the turn of the twentieth century (Tony Garnier, Russian constructivists, Bauhaus, Sant’Elia). They exerted influence on a virtual heritage of contemporary architecture (F. L. Wright, Le Corbusier). Splendid results gave release of architectural thought in SF movies (2001: A Space Odyssey, Alien). Virtual cosmic worlds were created also basing on traditional techniques, then implemented new media and finally computers.

Mental basis of a virtual architecture understood in a current manner became philosophical deconstructivism (J. Derida). Its architectural consequence are the works denying law of physics, functionality, traditional aesthetics. Franc Gehry states, that architectural work is materialized in the most attractive way in phases previous realization – sketches, model. New perspectives were opened to this way of thinking after digitalizing the workshop. Virtual architectural thoughts began to exist in considerably more spectacular manner thanks to computer visualization.

Marcos Novak writes: “The plan is dead. Representation has been temporalized and operationalized as interface for dynamic simulations.

Materially, an architecture of our times is one that is conceived algorithmically, prototyped rapidly, fabricated robotically; it is an architecture...
that is inherently intelligent and interactive, where space is attentive and time is smart; it is an architecture that is open to global telepresence, achieving closure only by extensions to remote sites."

This manifesto is true relating to the object of virtual thought. It does not induce remaining spectrum of architectural trends – like real architecture. Here plan is alive and works perfectly well.

Works of virtual thought are indispensable component of architecture development. They supply mostly field of architectural theory and critique but give also intellectual bases for creation of real works. They extend creators horizons and inspire. Till now they did not manage to detach from real roots. Even in periods of splendid growth (Renaissance, beginning of the twentieth century) they stayed on the margin of real architecture main trend.

Experiments in a new area

Department of Architecture Warsaw University of Technology is school with long tradition. We attempt to look in the future standing in historic context. We would like to present two trends of our scientific and didactic activities. They illustrate participation of new technology in building of architectural thought.

Virtual support to reality studies

We create a three-dimensional image of Warsaw - showing the city as it was in the past. The model is a starting point to a journey to the virtual world - making of a suggestive historic reality image - attractive and easy to understand for a wide range of spectators.

Condition of understanding the present shape of the city is consciousness of its past. Observing the urban transformations of the towns shown as objects settled in certain topographical, economical and historical conditions demands assembling and use of extremely diverse materials. Finding an universal method for moderate presentation of effects of such researches is a challenge for contemporary explorer. Modern media open new choice of possibilities in this range. Creation of the three-dimensional model of historic Warsaw becomes an inauguration of virtual trip, which limits and scale will be systematically extended.

Real targets of composition in virtual space

Our school from the beginning bases education on consciousness of artistic techniques – drawing, painting, sculpture. Intend of these activities is not competition with Academy of Fine Arts. We’ve worked out methods improving operation of immaterial, plastic substance leading to understand the building structure. Today we try to use the computer in a similar manner.

In cycle of seminar classes students receive notation of the musical composition. This is fugue c-moll from the assembly „Das Wohltemperiete Klavier“ by J. S. Bach. We tried to choose most characteristic example of baroque art – musical, that is virtual as per definition. Students undertook detailed formal analysis of the composition. We encouraged them to construct the individual image of musical space, and describe it with words. Then we acceded to model abstract forms responding the music. Passage of musical time relates to the narration of the movie, which shall be an effect of the exercise.
In result of the task we develop sculpture forms, spaces seen „from outside” and „from inside”, pictures inspired with real world. In discussions we search for factors shared by spaces of sound and picture. We try to describe elements characterizing the style of composition.

Theory of architecture problems are observable at different angles. As we can see their description serves equally examining the real and the virtual world. In both cases computer proves to be exceedingly functional tool.

Is it the limit of its role?

New architecture?

Major part of the opinions proclaimed presently formulates declarations: „revolution in art” or „new architecture”. Reasons for these transformations originate from sociological (globalization of information report, „dematerialization” of man’s life nature) and technical factors (world of imagination deprived of: gravitation, light, time; world of artificial impressions produced with VR equipment).

Marcos Novak described Trans-Architecture, which is build he the invisible scaffolding of information. El Lissizky pursued imaginary or virtual structures by means of afterimages terming „immaterial material”.

Most distinctly it is visible in words of Emanuel Dimas de Melo Pimenta: “the twentieth century represents, in a planetary scale, a process of mutation comparable to that experienced the Greeks immediately after Homer (...). For the first time a cosmos is essentially dematerialised”!

Our considerations drive to less radical conclusions. We do not see necessity to occupy the area of defined notions by new occurrences.

Architecture uses new tools in process of buildings creation. New branches of visual art build in cyberspace areas holding architectural features. Both tendencies grew from tradition present in culture since a long time. They are developed thanks to new technical means.

There is no new meaning of architecture. There are new media of architectural presentation. There are new areas of direct activity of architecture and its influences.

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