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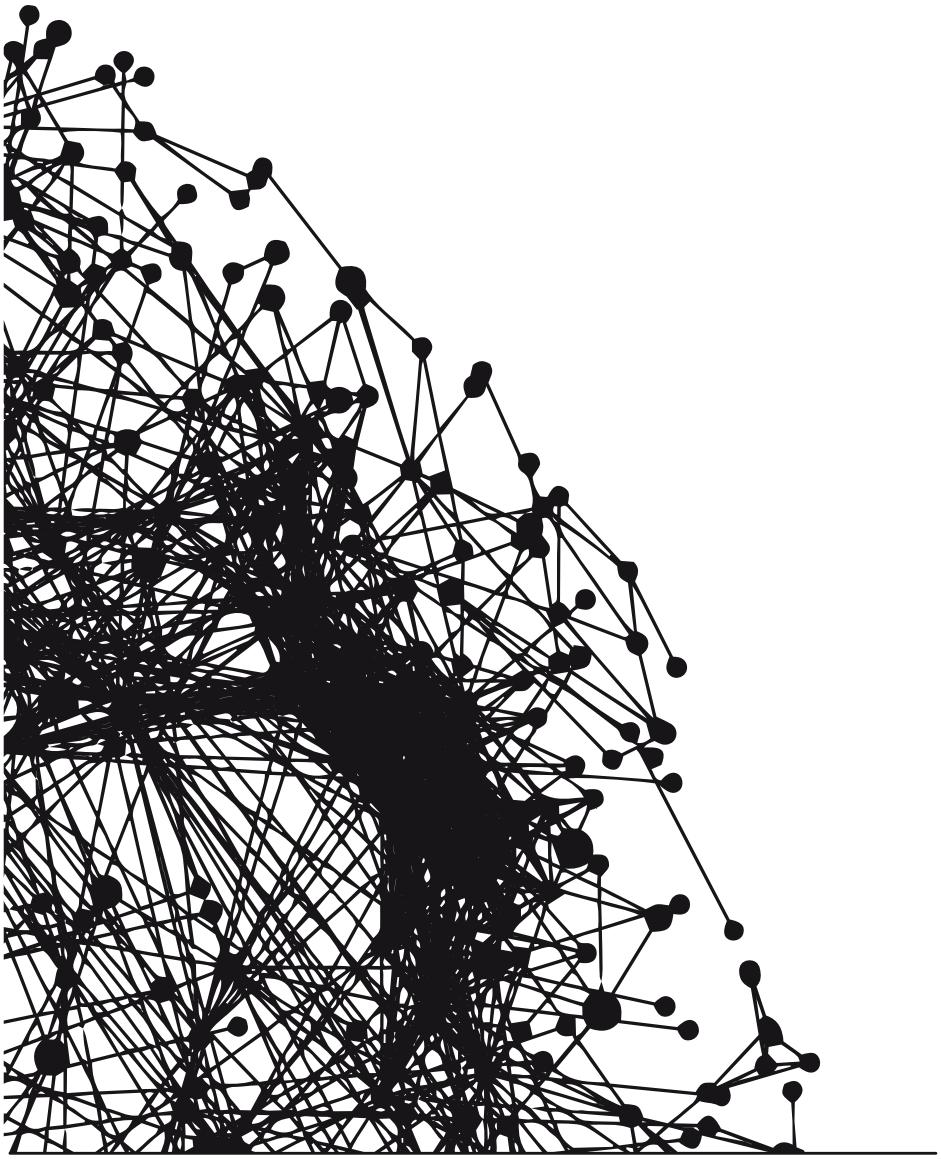

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INTERACTIVE FACADES IN MODERN CITIES

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ABSTRACT

Science and technology development in the media brings changes in everyday life and has a deep impact of culture, art and architecture. Dynamic digital technologies are included in all modern society segments as well as in architecture. Architecture is a part of interactive environment of modern cities based on computer-technology models. Interactive design in architecture, especially interactive facades design, has caused permanent changes in the conditions of architectural structure perception, as well as the conditions of social communication and interaction in the urban environment. Nowadays, unchangeable features of facades belong to history. The facades have become visually changeable, dynamic and able to meet the users' requirements and wishes. This paper aims to define the way these modern facades affect the appearance of new urban space and new communication forms and thus become the medium for specific social needs in urban environments. This paper presents the role of modern technologies, interactive programming, the Internet and social networking in architecture and modern facade design.

Keywords: Digital technologies, Facades, Interactive design

INTRODUCTION

Over the last few years two important processes have affected all the spheres of society and architecture – digitalization and globalization. As a result, cultural patterns in modern cities, technological possibilites in the field of architecture, urban perception and architectural perception have changed.

The post-industrial society is marked by: new parameters of space and time (real/virtual[176]), new social interactions (real time/entropy[177]), new materials and

[176] Šuvaković, M, p. 661.

technologies in the field of construction ('smart' materials/digital and nano technologies).

The application of innovative technologies provides continual changes of physical space. According to some theories, duplicate reality has become one of the basic possibilities of a new approach in the field of architecture. The current image of architecture contains the integration of virtual and immaterial with real, material space, where media-architecture causes an architectural object to connect these two realities.

ARCHITECTURE AND DIGITAL TECHNOLOGIES

Modern digital technologies have imposed significant changes in architecture, design and architectural function. Above all, these technologies cause important changes in the field of architecture by implementing intelligent and adaptable systems, where architectural space can adapt its parameters and connect them directly with users, passers-by and beholders. The main potential of information technologies is seen in creating emotional and personalized[178] aspect of urban and architectural space. According to architect Tojo Ito 'the main objective of architecture is to connect us with digital environment'.

Also, computer-based digital media enable the process of experience transposition from other art forms in architecture as well[179]. Changeability and dynamism are new forms of architectural expression. Yet, there is a real risk of putting up with monotony of commercialized society in the field of modern city architecture.

The works of several authors reveal that some theorists (Baudrillard especially[180]) are critical of digital informational environment, explaining that media and technologies create the world of illusions, where consumer values are dominant and media ideologies are defined as 'seductive cyberspace technologies'[181].

Virtual means a specific form of connecting technical systems with human beings.'Based on the post-modern conception, virtual reality is not the effect of individual surface (image, display) but a global or ambient simulation of reality.' Paul Virilio points out globalization and virtualization as two simultaneous processes.

[177] Entropy (Wikipedia) – quantities of information

[178]Puglisi, L, p.7-8. three main characteristics of a new architectural (hyper-architectural) media space:

1. immateriality,
2. sensitivity and
3. multi-media

[179] For more details see LAB(AU) at www.lab-au.com

[180] Baudrillard, J. (1929-2007). Topics of interest: globalization, media and high-tech societies; art and aesthetics in modern societies; fundamental changes in the field of politics, culture and human beings; impact of new media, information and cyberkinetic technologies.

[181] Baudrillard, J., *Simulation and Simulacra*

ARCHITECTURE AND MEDIA ENVIRONMENT

Urban displays, media facades and media architecture are the main forms of media interventions in urban environments and they represent' a unified media environment' (Tscherteu, 2011). Urban displays are subsequently applied to architectural structures in urban environments. Their construction, form and content exist independently of architectural buildings. Media facade is a hybrid facade in functional and aesthetic sense and represents the integration of architecture, technology and content (H**aeusler**, 2009). From a technological point of view, media façade is a structure that includes artificial lightning and/or kinetic elements that are able to provide dynamism and changeability as one of the major requirements for their proper functioning. According to Tscherteu, media architecture implies an interactive dimension of media facades, considering 'the possibility of architectural space to gradually adapt along with an active role of a subject'[182].

INTERACTIVE ARCHITECTURE

'A particular system can be defined as an interactive system if it is flexible enough to change and cause another system to change as well (when connected to that system), through the connection made between them'[183].

When trying to analyze the concept of interactive architecture, some of the precursors to interactive art[184] should be taken into consideration. When it comes to historical examples of architecture, the ones that are not directly related to digital media, one should mention Le Corbusier and his Philips Pavilion designed for the Brussels World's Fair in 1958. The Pavilion was the project where Le Corbusier expanded his ideas on design by adding music and visual media, thus changing the main language of architecture through their connection to other art expressions.

How did the concept of interactivity gain such an important role in current architectural researches? There are a few reasons. Firstly – interactivity includes modern communication systems based on making choices and creating hypertext[185] systems based on digital media. Secondly, interactivity is focused on a subject (changeability of architecture, reshaping and personalization) instead of an object

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*Fiction novelist William Gibson coined the term **cyberspace** in his novel Neuromancer (1984); Gibson defines the term as 'the space where the information found in virtual environment can be vizualized as geometry structures' (See Suvaković M. p.* 125*)*

[182] http:// www.mediafacade.org

[183] H.Haeusler, p. 230.

[184] Šuvaković, M. p. 279. **Interactive art work** is a form of art that involves 'network performance or the situation where there is a hardware and software feedback between computer systems and recipients, or in other words – there is a recipient intervention through technology systems'.

[185] A prefix **hyper** is a Greek word υπερ (huper) that means over, above. **Hypertext** is writing a text using various possibilities (computer links) in order to offer a certain form of interactivity and enable indirect connection with additional information apart from the text and different access order.

having 'an absolutely unchangeable nature' (standardization, duplication, serial production). Thirdly, in the context of time, 'interactivity is a concept of continual spatial reconfiguration, changing the boundaries of time and space that used to be regarded as unchangeable.' Lastly, interactivity includes the main characteristics of computer systems, i.e. the ability to create interconnected, changeable 'sets of information' that can be continuously changed (Saggio A. 2005)[186].

The urban public interactivity is realized through movements of numerous different people; the very design of these areas direct a type of activity taking place there. Media architecture creates specific social interactions in a particular location; on the other hand, they are the result of certain activities taking place within the location (Tscherteu, 2011).

Interactive media architecture can facilitate the process of creating modern cities identities, since the inhabitants themselves should take part in creating these identities through their urban space activities (Susan Eastman and Friedrich Krotz 2001) (Figure 1). Some authors have a dilemma and wonder if media facade should decontextualize surroundings or accentuate its cultural identity (Singer 2010, 54).

Figure 1: PSD-Bank, Munster, Germany, 2008, arch. Kronhagel. Creation of city identity: Innovation and Change

INTERACTIVE FACADES

The application of interactive programming model causes media facades to become a part of interactive architecture. The system of interactively programmed media facades is an intelligent system that provides specific responses after the users have applied specific sets of inputs[187]. Similar to emotional behaviour, responses are not

[186] AD 4D space, p.23.

[187] See more details about intelligent systems. Intelligent façade (according to Annemie Wyckmans, Norwegian University of Science and Technology, Trondheim at *Inteligen arh.pdf*) is a facade able to adapt to its surroundings, considering perception, response and activities;

always predictable. In most cases, the system is programmed to provide more responses to input sets. Facade 'responses' are in the form of sounds, light or projection (text, graphics, photo, film, music....) (Figure 2-3.).

The interactive programming model implies that 'people are able to take part in architecture without being passive and dealing with static sets of conditions, but proactive individuals shaping both space and architecture'[188]. Not only does the concept of media architecture include a façade, but also interior parts of a building that are affected by façade activities as well as by the public space a building is surrounded with.

Figure 2, 3. ARS Electronica center, Linz Project GuitARS- is a project promoting the interaction architecture/music, architecture/logic game (Rubik's cube)

Media facade is an integral part of urban environment that is available for a great number of users. Mobile phones (SMS, bluetooth), laptops or touchscreen are used to show some personal messages on facades and achieve a high level of identification with architectural objects, which is defined as an innovation in architecture. Cameras, sensors and other intelligent systems provide a proper system functioning (Figure 4).

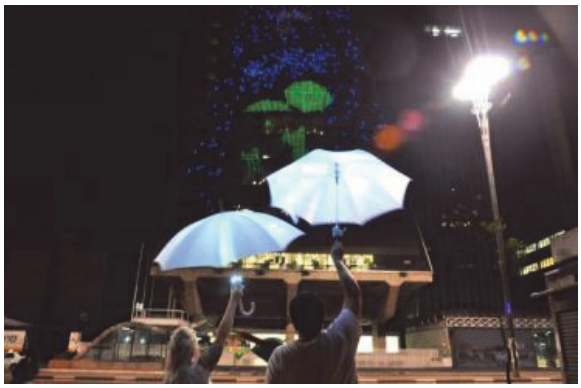

Figure *4*. ***Dancing in the Rain*** **by Pfadfinderei + The Constitute, Connected Cultures, Sao Paulo 2013 (http://connectingcities.net)**

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this facade causes a building to deal with new situations and solve any problem caused by interaction with external environment.

[188] *Flexible*. p. 209.

Interactivity enables individuals and groups to connect with physical space[189]. 'The individual's presence is scaled to match the scale of city... This is how light in the public realm can transform the public realm itself.' Changeable characteristic of glass as a material supports a new paradigm in architecture. (J.Carpenter, 2011) (Figure 5).

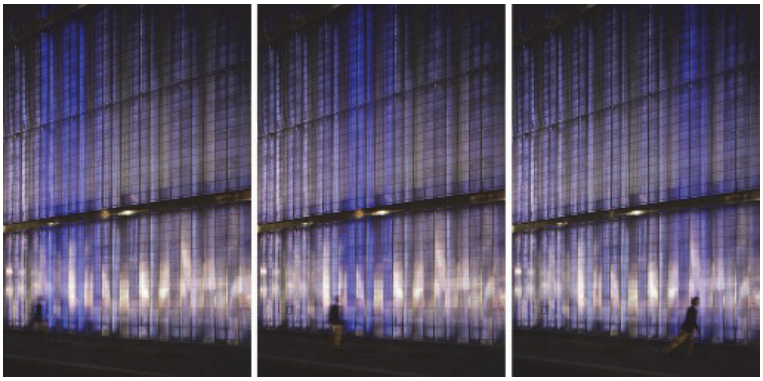

Figure 5. Podium wall 7 World trade center, media content on both south and north glass façade, the system of video cameras recognizes pedestrians and their movements nearby the building itself and transforms them into bluish LED lines spreading over a seven-floor facade (Kinecity Llc, artist James Carpenter (http://kinecity.com/podium-wall-7-world-trade-center/)

The use of a classic video game within an urban space and video animation is carried out through mobile phone applications where beholders are able to create their own image on a facade and e-mail it. One of the examples that should be pointed out is the interactive temporary facade placed on the already existing T2 tower of the National Library in Paris, during Nuit Blanche Art festival. This is a small resolution facade - the facade division system of facade segments is 20x26, 520 pixels on the surface of 3370 m^2 on one of very important buildings of Paris (Figure 6).

Figure 6. Blinkenlights Arcade 2002, Paris, France (http://bilkenlights.net/arcade)

Media façade can be a platform used by citizens who share their experience. It is also a model of interconnection of cities. The project *Connecting Cities* is the European

[189] Damoon Seeley, partner in *Elektroland* (Los Anđeles)

infrastructure of cities – they exchange their artistic and social experience through media façades. The main objectives of this project are: networked cities based on media facades, which creates the field of intercultural exchange; citizens are involved through their personal interventions, such as taking part in the urban public space; artistic, social and intercultural processes are to be available and sustainable within urban environment. In his collection of essays 'The Transparency of Evil' (1993:1995- p.16), Baudrillard defines *transaesthetics* as a situation where art is everywhere but it is nowhere as a particular phenomenon.

Conclusion

Over the last few years the concept of interactivity has become significant in the field of modern façade design. Media facades and their active light source represent a suitable model for performing the mentioned concept. The objective of architecture is to connect a subject to digital environment through the process of event creating within urban public space. These events are able to change spatial activities, stimulate interaction among people and their re-integration into urban public spaces. As for function, content and visual form, interactive façade is the result of multiple social and cultural interactions and reactions.

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