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# SCREEN MEDIA INTERFACES AND ENVIRONMENTS

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## A B S T R A C T

The emergence and the development of new media forms took many diverse directions at the end of the twentieth and the beginning of the twenty first century, significantly influencing many areas of everyday life, as well as contemporary architectural practice. New types of architectural space emerged, types that are based on both new media and architectural principles. These spaces are screen, interactive, kinetic, biotechnological, as well as environments of light. These kind of environments gained new principles and features well known in new media field. Especially important for architectural context is the great potential of new media to create illusions and simulations, to produce augmented and composite, virtual realities and spaces. Virtual space represents one of the most challenging form of new media spaces. It is also the most complex form of screen media environments, so complex that it has taken its own, radical course. Besides the most advanced and complex, screen media interfaces also represent the oldest and typical forms of media architecture. This article will analyze emergence of screen interfaces in architecture, discuss their forms and modalities and examine their influence on human impression of space.

## KEY WORDS

SCREEN  
INTERFACE  
MEDIA  
ARCHITECTURE

## INTRODUCTION

Screen media environments are the oldest type of new media architectural spaces, which must be discussed in terms of wider discourse of digital and post-digital spaces of information, simulation, virtuality and immersion. These expanded types of space are a direct consequence of the nature of the computer medium, which has great representational powers and very easily creates strong illusions. When we discuss screen interfaces, we actually discuss ways computers are present in space and the way they communicate and interact with people. Screen interface in space present a way, a portal of communication between people and machines, reality and virtuality. This interaction between man and computer, and the role of the screen in it, has changed over the years, with the development of computer technologies.

If we accept Mark Weiser stand<sup>1</sup> on three stadiums of computer technology development (he distinguishes stadiums in any technology development being only the ones in which relationship between man and technology radically changes), then we must be aware of the PC (Personal Computing) and UC (Ubiquitous Computing) era when discussing screen interfaces<sup>2</sup>. In PC era there was one man communicating with one computer, forming, what could be viewed as the intimate relationship. This relationship was made possible by the screen, which served as a portal, a window into another dimension, a virtual world of online content, space and communities. Therefore screen represents one of the oldest motives and elements of new media culture, suitable for interpretation into architectural language and space. With the rise of UC era, screen as an element has changed. UC era is the era in which computer elements and technologies are all over us, embedded in space, in things, even in our bodies. Trends of miniaturisation, mobile and portable technologies, turned classical screen we know from the PC era, into screen units, modules and displays of different sizes, purposes and shapes. These trends culminated with miniaturisation of the screen into the VR headsets that can transport, better than ever, user and its perception into another, alternative and virtual space. Through this course of development we can notice that not only the screen as element is changing, but also its relationship with the human body, which is a topic Lev Manovich drew attention to<sup>3</sup>.

In nowadays architectural practice screen interfaces and environments are very diverse. They developed from media surfaces and facades that use screen modules and behaves like screen media, to complex virtual environments. Some of the examples of practice don't even have any screen technologies involved, but are interpreting, questioning and simulating some of the screen media

notions and principles. Especially suitable technology for simulating screen mediations in architectural space is lighting, especially LED technologies. The relationship between screen media and light media in architecture is strong, intertwined and has a long history.

For discussing screen media environments and interfaces in architecture, the starting point must be the understanding of the notion of the screen itself. We mentioned computer screen and its development from a flat surface in front of the human body, to a wearable technology which allowed for screen to actually become a three-dimensional space that was once behind it. But we should keep in mind that screen as a notion is much older, and has forms that are older than the computer ones. The origin of the computer screen lies in the military history. First computer screens were designed and invented for the military purposes of surveillance and tracking enemies<sup>4</sup>. Not only screen, but the computer technology altogether derived from the ‘iron triangle’ – military-industry-academic research of advanced technologies. The origin of the interest of exploring the issues of surveillance and tracking in screen media environments in architecture lies exactly in this stage of computer and screen media development. After computer found its way to general use, outside of government and military, purpose of the screen has changed, too. With the development of dynamic images, screen got its use in amusement industry - cinema and other forms of presentation of media content. The origin of narrative, cinema like and media themes in screen interfaces and environments in architecture lies in this stage of the development of screen media.

## CHARACTERISTICS AND THEMES OF SCREEN MEDIA ENVIRONMENTS

Augmented and Virtual Reality, Telepresence,  
Interactivity, Real-Time Design and Immersion

The development of screen media has brought many new features into designing environments of today. Virtual layers of reality, interactivity and telepresence (remote presence) are just some of them. Screen as a medium has existed for centuries and has always served as an access portal into another world of information and alternative reality. Manovich sees three capital stages in the development of screen media, classic screen era, dynamic screen and interactive screen era<sup>5</sup>. All three types of screens are still used in designing space. Typical example of classic screen, which is the oldest type of screen media, would be the artistic painting. Here, the screen is flat, rectangular surface that should be observed from a certain distance up front. It exists in real space and functions as a window, a portal into another – a representational space of the painting. But



the world that painting depicted was a static image that relied on imagination to enliven it. With the development of the moving images technologies screens became dynamic and started presenting visual content changeable in time. This type of screen and content demanded for the relationship with the viewer to change. As Manovich notices, viewing regime has changed. This type of screen media was much more aggressive and needed full attention of the viewer, as well as his complete physical steadiness. This was for purposes of better immersion of the viewer into the media content.

The third phase of development of the screen media started with the emergence of real-time screen, from which interactive screen derived. Real-time screen is type of a screen that can present content changeable in real time. Dynamic screen presented changeable, but predefined visual material, while real-time screen was able to present unpredictable, changeable and editable content in real time. The first form of real-time screen was a radar screen, which over time became interactive, and evolved into computer screen. In computer screen phase, the relationship between screen and the physical body of the viewer changed again, as well as the way in which screens present visual content. Manovich identifies two completely different and opposite ways computer screen has developed for displaying media content<sup>6</sup>. One was multi-window view, a new viewing regime in which none of the images and windows is dominating. All windows exist on the screen at the same time, and user can choose whether he is going to pay a little attention to every window, or he is going to focus all attention to only one of them. Other new regime of displaying media content is totally opposite to the above described, and it has superseded the screen media itself. This form is VR environment. This form of screen interface is so radical that it presents the end of screen media as we know it. In VR, in technological terms, screen becomes a small piece of equipment, a head mounted display, that user puts on his eyes. In conceptual terms screen has become three-dimensional space all around us. What was once content behind the screen now is information space all around us, augmented reality, in which we can take actions and affect it. In this setting screen media constitute space, a space in which real and virtual worlds finally collide into one. In this form, screen media have finally managed to take their task of immersing a viewer in the mediated content to another level – a full immersion with radical cutting of reality. In VR environments, screen stopped existing as a flat rectangular portal into another dimension, it became that dimension itself. Technically, in VR, screens mounted as head displays calculate and generate perspective images according to users' moves. These perspective images change in real time and create strong illusion with user that he is present in representational space, because it responds to his movements and actions.

Through all of these phases of development, screen media has engaged human body in different ways. In classic era, body was free to move, but should stay around screen, best in front. In dynamic era, body was imprisoned in a seat, but the mind was taken more dynamically into the alternative world of moving images. Manovich points out that this was like this, because in moving images technology, camera identifies with the eye of the viewer. Camera represents our moving eye in the spaces and situations presented on screen. Finally, with the development of VR technologies, this method was taken to another level. Now the viewer's eye and the camera completely merge, as the screen is no longer few meters in front of us, but is directly in front of our eyes. In this way, screen disappears, and the eyes of the viewer become the camera that is moving through three-dimensional space. The viewer is completely immersed and his physical body becomes just an input control<sup>7</sup>. What was once a mouse on the computer screen surface, it is now a body of a user in the VR environment. In this kind of screen interfaces, in one way, physical body is freer than ever, but in another, it is most radically imprisoned and taken over. With the development of VR environments we can see presumptions of the post-human theories becoming reality. In virtual worlds, physical body becomes redundant and just a kind of a console that can easily be replaced with some other means. In VR mind and perception are the ones that matter. Their playgrounds are spaces of illusion that use different kind of logic, communicating and interacting than the real world. But VR environments are still futuristic category of screen interfaces that is yet to be fully developed.

#### Aesthetics of Screen Media Environments: Mediation, Relation, Spectacle and Simulation

To truly understand aesthetics and functioning of screen media spaces, one must understand the term of screen media itself. The term is coined to gather and envelope all forms of media that came out of the process of merging all existing screen forms with the computer technologies. This process ended up in development of hybrid, multilayered, real-time and interactive screen media forms which inherited characteristics of all merged technologies. That is why in screen media spaces we can find screen rhetoric and principles of telepresence, immersion and simulation. Video infused ideas of extended dimensions of time and space, and computer enabled principles of real-time communication and design, interactivity and dynamism.<sup>8</sup>

As well design principles and concepts above mentioned, visual nature and aesthetics of the screen media spaces is also specific. Screen media spaces in architecture are spaces of post digital aesthetics which has dual nature. That nature is one side highly visually spectacular, which relies on great powers of

digital media to create illusions. On the other side post digital aesthetics of screen media spaces goes to another extreme – it tends to be minimal in postmodern tradition, to be experimental, non-visual and informational. It tends to provide experience and value behaviour more than visual qualities and features. Because of their interactive nature, screen media spaces are also spaces of relational aesthetics, where architectural interventions consider forming relations as much as forming visual elements.

In spaces that rely on principles like this, aesthetics is referred to as ‘augmented’ and ‘special’. As mentioned above, aesthetics of screen media spaces can be both – highly spectacular or highly immersive. This dual nature raises a question if it is the aesthetics of spectacle, or the aesthetics of simulation. Baudrillard referred to the rise of new media aesthetics as coming age of the death of spectacle and the birth of simulation,<sup>9</sup> but Darley saw their aesthetics principles as an extension of the aesthetics of decoration and spectacle.<sup>10</sup> As well as aesthetics, new media society is also discussed to be the society of spectacle or the society of simulation. Being this or that, Manovich is only sure about one thing, that it is a society of a screen.<sup>11</sup>

This simulation vs. spectacle nature of new media environments, on operational level, leads to presence of two types of mediation in screen media spaces. Remediation theory refers to these two types of mediation as hyper mediation and immediation. Hyper mediation refers to the technological aspects of the mediation in space – drawing attention and fascination of the user to the technological aspects of the screen media environments. Immediation refers to the opposite, technological mediation of content – immersion of the viewer into media content.<sup>12</sup> In most screen media environments, except of VR, both modalities of mediation are present, and the focus of the user usually switches between the two.

In terms of aesthetics it is also important to notice what has happened to the notion of surface in screen media environments. Digital technologies have made it possible for surfaces to become mutable, multilayered and have depth. Computer screen presents a paradigm of the digital aesthetics and of what is desirable in the terms of surface design. The digital screen aesthetics directs surface design towards super fluidity, mutability, changeability, being focused on presentation and production of excitement for keeping the mind busy. That is why Darley sees digital and screen aesthetics as an extension of decorative and exuberant styles.<sup>13</sup> Sometimes it can be exaggerated and manipulative. A few questions can be raised about its purpose – is it favoring presentation over meaning, is it superficial, is it making intellect become easily entertained, slow

instead of critical? Altogether, new media and screen development has brought many new qualities and features that can be discussed as bad, as good, or simply relative.

### Themes in screen media environments

All central issues in screen media environments revolve around two main themes. One theme is the multilayered and mutable computer screen surface, explorations of its interpretation and use in space, as well as its hypermedia and information nature. The second theme is the theme of immersion and screen simulations, which is introducing the dusk of the visual and dawn of the virtual.

In contemporary architectural practice, the theme of multilayered, mutable, information and responsive screen surface is explored through many forms of spatial explorations. Screen surfaces are explored through media façade surfaces, elements of augmented environments, spatial installations, or elements of public spaces. Sometimes these media surfaces are exploring media context and mediate content, but sometimes they focus only on technological interpretations of the computer screen in architecture, through technologies such as LED lighting and similar.

The theme of immersion and simulation is also explored through diverse spatial explorations. Architects now design spaces that contrast or synchronise composite realities, augmented and virtual environments. In such environments narrative of the space usually evolve around issues of interactivity, human-machine interaction, constructing composite and virtual realities or animated and cinematic spaces that explore spatial possibilities of moving images. Creating spaces of information and virtuality, animating architecture and exploring narrative and cinematic possibilities of moving images in space are concepts that are coming together into forming a new design methodology in architecture. In this design methodology, even a new type of architectural drawing is emerging, a type suitable to catch all aspects of navigable and dynamic architecture, a type that Nic Clear defines as ‘chronogram’.<sup>14</sup>

### TYPES OF SCREEN MEDIA ENVIRONMENTS

Experimenting with screens in space is one of the oldest forms of media architecture that took rise in the decade of 1990s, but existed before, more in artistic than architectural explorations and installations. Nowadays, the examples of practice and modalities of screen media used in space are very diverse, but at the beginning of the development of the field, media facades were the most interesting for architects. German studio realities: united is one

of the first to profile their architectural practice as ‘media architecture – art, architecture and technology’.<sup>15</sup> They were amongst the first to develop media façade architectural systems which besides architectural, carry layers of information, media content and communicative possibilities. On the other range of the spectrum, most futuristic types of screen media interfaces nowadays are VR environments, but also cinematic spaces of expanded reality which rely on methods and techniques of film, animation, video and motion graphics.

### Screen Media Interfaces

If we discuss types of screen media environments, we can start with screen media interfaces in space, which are the oldest form to use screens as architectural elements in space. In screen media interfaces, usual modalities of screen used are video installations of large proportions or multiple projections, whose goal is to create an effect of telepresence and augmented or composite reality. The matter of scale is important in creating an effect of immersion. If the scale of the screen and media content it presents correspond to the real life scale, the effect of immersion into parallel world is stronger. On the other hand, some of the examples of screen interfaces in practice don’t have a scale, or to say, can be scalable in space. The usual questions that these types of environments explore are navigational models of space, human-machine motion capture and interaction, distributed and networked models of space, transit of information, and relationship between data, virtual and real space realms. Many examples of practice explore exactly the question of the balance between virtual and real space realms, as well as methods through which this balance can be designed. These explorations are treating an issue of space boundaries as well.



Figure 1. Jeffrey Shaw, *The Legible City*, New York, 1989; Amsterdam, 1990; Karlsruhe, 1991.  
(Source: <http://www.jeffreyshawcompendium.com/portfolio/legible-city/> (accessed: 06.05.2017))

The examples of screen media environments in practice are quite diverse. It all began with explorations of screen use in space by artists like Jeffrey Shaw, Myron Krueger, Scott Snibbe, Ron Arad and similar. We can say that classic of a genre is Shaw's *The Legible City* (1989) installation where he puts users onto a bike in front of a screen, and while pedalling is done in real world, it gets users moving into a virtual one. The users drive bicycles through a virtual city (of Amsterdam or New York...), which has streets and buildings built of information. Virtual cities have volumes of buildings and street maps that correlate to reality, but are presented like text structures. In this way, Shaw makes a fine overlapping of reality and virtuality, and a fine questioning of relationship between the realm of architecture and the realm of information.

In the twenty first century information is more and more becoming a conceptual element of architectural design. Since Shaw's explorations on, many works have engaged screens as extensions of space. Most of them are indoor environments, but there are interesting examples the use of screens in a landscape. Such is a piece from Ben Ruben *Story Pipeline* (2002) in which long screen pipeline is crisscrossing between trees in natural landscape, presenting real time changeable media content about Alaska in form of text. In this way, the author poetically infused artificial dynamism into a natural, peaceful and mostly white landscape. An elegant screen pipeline fused aesthetics of the digital and aesthetics of the natural in extended reality natural environment.

There are examples of practice that are highly experimental, but could be considered as an architectural intervention in space, since they carry architectural potential and create powerful influence on perception of space. In the age



Figure 2. Ben Rubin, *Story Pipeline*, BP Energy Centre, Anchorage, Alaska, 2002.

(Source: <http://workbeautifully.blogspot.rs/2009/02/story-pipeline.html> (accessed: 06.05.2017))

of new media, architecture is becoming much broader term and discipline. Architectural interventions are becoming ever more fluid and interdisciplinary, what is a direct consequence of the technological spirit of the time, in which many disciplines of art, science and technology are blurring boundaries and territories. Such experimental screen interfaces are the ones that, for example, use human body as screen media element in space. Such piece is *Autopoiesis* (2010) by Rafael Lozano-Hemmer. It is an installation that uses reversed screen logic in space. People approach a mirror, but instead of the mirror becoming just a reflection, it has a motion capture camera and a laser projector built in, that is able to project the text on the face of the observer. In this way, beside the mirror, the viewer becomes the screen himself. The text is corresponding with the motions of the face, so users have described this whole experience as unexpected, but awakening in terms of self-presence in space. People have also described that this kind of intervention in space has made them think and be aware of invisible and technological layers of space, electronic shadowing and possible surveillance.

Also, an interesting example of screen interface use in space is *De-Viewer* (1992) by ART+COM Studios. In this intervention they play with the prejudices we have about screens. They put a classic art painting by Giovanni Francesco Caroto on the wall, but when viewer draws attention and holds eye focus on some specific detail of the picture, that area of picture starts to decompose into pixels. In this way ART+COM plays with the expectations of a viewer, making classical screen behave like digital, real-time and a responsive one. In terms of architecture these kinds of works have introduced ideas of responsive and mutable surfaces in architecture, which can behave as nonstandard technologies – in variable and customised way.



Figure 3. Rafael Lozano-Hemmer, *Autopoiesis*, Manchester Art Gallery, Manchester, 2010.  
(Source: <http://www.lozano-hemmer.com/autopoiesis.php> (accessed: 06.05.2017))

The example of using screen media interfaces in space to mediate layers of information and virtuality can be seen in Belgrade too. In the *Project of Reconstruction of Nebojša Tower* (2011), the authors Dejan Miljković, Jovan Mitrović and Branko Pavić have used screen media to create multimedia interface in part of the project that was exhibition of the Tower's past. On the ground floor, the authors have used a matrix of visually connected, yet fragmented screens that formed a semi-transparent surface in space. This surface-media layer in space was there to present an abstract chronological layer of Nebojša Tower history – a layer in which it was a dungeon, at the end of the eighteen and the beginning of the nineteenth century. In that period, the tower was a place, and a symbol of torture and Ottoman repression over the Balkan Christian nations<sup>16</sup>. The authors presented this layer of history of the tower in a very subtle visual way, making it present in space through visually half transparent screen matrix of fragmented images of victimised people. By choosing this media expression, the authors have managed to present destinies of people in more emotional and lively way, contrasting changing fragments of human faces towards peaceful, steady and uncompromising architecture. In both conceptual and visual way, the authors added a subtle virtual layer to the space, inscribing dimension of time in a dimension of space.

As stated before, the most complex form of screen media interfaces are VR environments. One of the oldest examples of practice, and a classics of a genre are *Osmose* (1995) and *Ephemere* (1993) by Charlotte Davies. In the environments like this, the perception of the user is completely cut off reality and immersed into virtual space. In *Osmose*, Davies constructed a virtual world

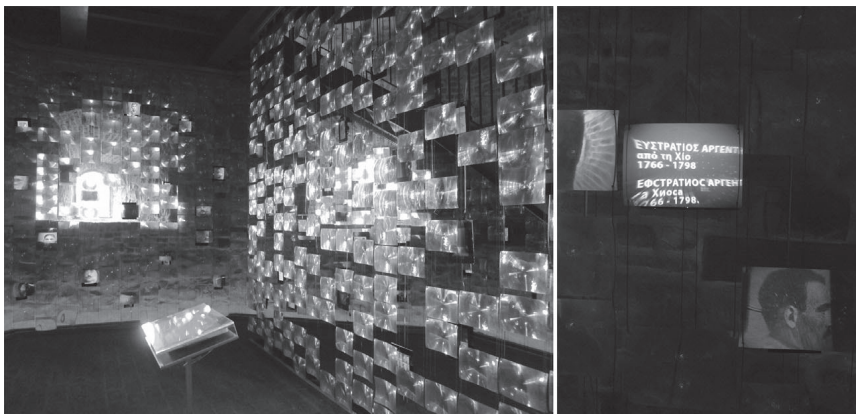


Figure 4. Dejan Miljković, Jovan Mitrović, Branko Pavić, Project of Reconstruction, Nebojša Tower, Belgrade, 2011. (Source: Author)



as a three-dimensional grid that uses movements of the physical body (sensor belts and gloves) of the user for navigation through space. Breathing and balance of the body is used for transporting user into the worlds of virtual forests and landscapes, whose pace of navigation correlate with the breathing pace of the user. Christiane Paul notices that Davies is very successful in avoiding the representational realism in her works. She creates virtual worlds that are poetic and have artistic sensibility. Paul also points out that Davies infused concepts of text and code in her abstract virtual meta layers, which she used to inscribe natural landscape into an environment of virtual data space<sup>17</sup>. In her worlds, Davies questions relationship between physical body, perception and illusion.

Nowadays, VR Environments are constructed as Semi-Immersive Virtual Reality, CAVE Fully Immersive Virtual Reality and Collaborative Virtual Environments. In every type, the level of immersion is at a different level. In Semi-Immersive Virtual Reality complete immersion is not a goal. In CAVE Environments total engagement of senses becomes possible, and Collaborative Virtual Environments have the goal of many people sharing a virtual experience. Technologies used in all types of environments are tracing sensors, software for generating perspective images in real time, video, projection mapping, light, sound and music systems, and in recent times, haptic technologies. Haptic systems are those who enable person to experience a reaction called ‘force feedback’. This reaction is usually based on movements and vibration which contribute to the experience. They can also incorporate sound, images or video features.

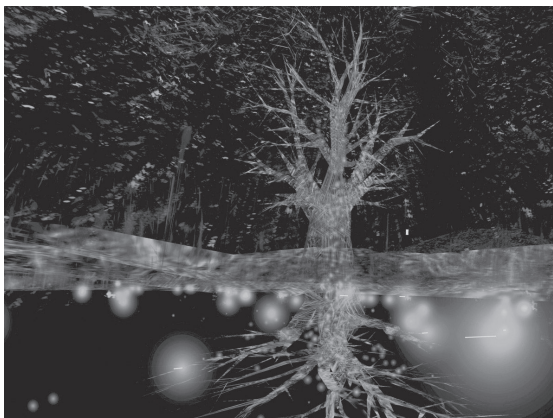


Figure 5. Charlotte Davies, *Osmose*, 1995, Virtual Environment.  
(Source: <https://alchetron.com/Char-Davies-490073-W>(accessed: 21.08.2017))

## Expanded Cinematic Spaces

Expanded Cinematic Spaces are those environments in architecture that use concepts of television, video and film, which all present dynamic screen modality types. But computer technologies gave new possibilities for moving images to acquire spatial dimension. In these cinematic spaces film as we know it – as a simple and predefined *recording of reality*, stopped existing. Cinematic spaces are expanded spaces of reality in which narrative, as we know it from film, exists, but is infused with real-time video streaming techniques, interactivity and responsiveness. Most advanced ideas in the area of exploring spatial possibilities of moving images are Nic Clear's ideas, which have a unique approach to using moving images in architectural practice. He has an opinion that architecture is too slow and rigid as a discipline, and that it doesn't look for innovative ways to incorporate moving images technologies in designing space. He emphasises *Panic Room* (2002), a film by David Fincher, as an example of the innovative use of the language of film in architectural context. In this film, in one very long uninterrupted shot, the director is using camera in very unorthodox and architectural manner. Through camera lens, he presents us architectural space very suggestively, as a space of suspense and fear, (which correlates with the story of the film), going through layers of rooms, building structures and similar, in a view a person could never experience it<sup>18</sup>. This mix of narrative, film language and architectural language presents exciting possibilities for designing future architectural environments. Designing spaces that use principles of moving images is a hybrid activity, to conduct which, architects would have to expand their usual skills and knowledge. For the purposes of this new design methodology, Clear argues, that a key feature would be developing a new form of composite architectural drawing which



Figure 5. Paul Nicholls, *Golden Age-Simulation*, Chronogram, Mentor Nic Clear, Bartlett School of Architecture, Unit 15, 2011.

(Source: <http://aap.cornell.edu/news-events/nic-clear-15x15-fifteen-years-unit-15> (accessed: 06.05.2017))

would combine architectural, graphic and film principles and methods. These type of drawing, which Clear defines as ‘chronogram’ would be able to map, unify and synthesise all formal, narrative, experimental and spatial aspects of such design methodology. This type of composite drawing has four main tasks – to set a narrative and tell the story of a project, to describe and incorporate all processes of the production, to communicate style using graphic language, and to develop and communicate spatial ideas. Experimenting with chronograms at The Bartlett School of Architecture, Clear has made a conclusion that they have a great level of efficiency in achieving their main goal – making a fusion of narrative and spatial concepts, production techniques and style characteristics into a new form of extended cinematic spaces.

### Media Facades

Media facades are probably the most well-known form and a term connected to media architecture. Many people’s first (or only) thought are still media facades when mentioning media architecture. Tim Edler from above mentioned realities: united studio, defined the practice of the studio as media architecture and media facades as architectural interpretations of the paradigm of the screen<sup>19</sup>. In these interpretations architects use different architectural technologies to interpret screens. In many of the examples of the practice they don’t use literally screen technologies. Media facades do not serve only as an envelope of the building, but also as its communicative layer. In media facades development, we can see many ways of their conceptualisation and construction. In some of the examples, façade is treated like a blank canvas for projecting movements and happenings from the environment of the building. In theoretical discourse this type of façade isn’t always considered to be media façade in true meaning of the



Figure 7. Chaos Computer Club, *Blinkenlights*, Berlin, 2001.  
(Source: <http://blinkenlights.net/project> (accessed: 10.03.2017))

term. Other examples from practice use large scale of façade surfaces to present already predesigned and prepared media content, and some are turning facades into real-time responsive surfaces which can collect information from the surrounding, process, convert them and present as a form of new visual content. Some examples made media facades interactive, so they gain participative character too. Participative design concepts have made it possible for common people to create and influence on the façade appearance and behavior, which many people find exciting, provocative and fun. The examples of such participative design concepts and real-time interactive media façades can be seen in the project *Blinkenlights*, presented in Berlin (2001) and Paris (2002) by Chaos Computer Club (CCC) group. In *Blinkenlights* project CCC treat façades as a low-res computer screens. On every window of the façades involved in project, they put a white canvas, and behind it a source of light, so at night the windows behave like pixels of the giant screen. At night, facades would present animations, video, text or games, and some of the participative media content. Through specially written software, CCC enabled participants to create content that will be displayed, and by using their mobile phones the participants could even play computer games in real-time on the façades. Playing games in real-time on the giant façade screens aroused much interest amongst many people, who wanted to participate and be part of the project. This project has a very playful treatment and design of traditional architectural element such as façade. Its simple conception establishes and evokes a special, but clear and simple, relationship between basic architectural and basic computer, screen and media elements.<sup>20</sup>

#### IMPRESSIONS THAT SCREEN MEDIA EFFECTS CREATE IN SPACE

The field of new media is developing very fast. Diverse technologies and media modalities produce new and different possibilities for conceptualising, communicating and constructing space, and theoretical discourse is coping with fast expanding practice trying to form a coherent field. Social aspect of new media in architecture considers theories like post-human future and society, in which relations between man, technology and space are significantly changed. Post-human society lives in the era in which technology is omnipresent, and both humans and their environment, are augmented technologically. The concepts such as technologisation of biological systems and physical environment, development of artificial and distributed cognitive systems and spaces and similar, cause ambivalent feelings and attitudes in people. Considering questions like these, people are usually not indifferent, they either have optimistic and excited, or pessimistic and worried attitude. Whatever

individual attitudes are, modern technological trends are all together considered very seductive and persuasive. Society likes more and more central place that a person and ‘personal’ is getting in everything. Trends of interactivity, responsiveness, participation, variability and customisation are very welcomed in all areas of everyday life, and architecture is not isolated phenomenon from it. In the field of architecture, technological trends like these have influenced and caused transitions of the notion of ‘author’ towards the ‘mediator of space’, and the notion of the ‘user’ towards the ‘participant’.

Because of the nature of the above discussed new media, designing new media spaces nowadays means designing space as much as designing experience and the impression of it. New media architecture is highly relational. It has new category of designing a ‘behaviour’ of space, which becomes responsive towards the behavior of the participant. In this way, every formed relationship between an individual and a space becomes unique, personalised and subjective. The subjective experience of the space is becoming more and more explored topic in architectural discourse. So far, we can find research of subjective impressions of space in the field of light and lighting design effects in space. In the domain of screen media modalities used in space, and environments they generate, not much research has been done regarding their effects on subjective impressions of space. At this point, this paper will take in consideration this domain of screen media environments.

As a part of a larger research on subjective impressions that new media modalities produce in space, a survey was conducted at the Faculty of Architecture, University of Belgrade<sup>21</sup>, of which one part treated impressions that screen modalities produce in space. A questionnaire was given to the group of thirty eight students, which presented eight examples of new media environments, of which two were screen media. Screen modalities presented in questionnaire, were picked to be – the most renowned and commonly used one in architectural practice – a media façade (above described *Blinkenlights* project by CCC), and the most abstract and complex one – VR environment (*Osmose* by Charlotte Davies). The examples shown are completely different in their conception, and they present opposite ends of the screen media environments in architecture. By answering the proper questions, with given options to choose from, the results of the questionnaire showed the following results.

In the domain of the realised aspects of space, in case of dynamic and interactive media façade *Blinkenlights*, the participants of the survey gave best grade to the aspect of dynamism. The second best graded was the aspect of technological conception and realisation of space, after which followed participation.

Illusions/simulations in space, narrative aspect of space and use of technology as an artistic medium were not highly graded. In terms of impressions that this modality of screen media generated in space, excitement was the highest ranked, after which followed surprise, then fascination with the technology used, feeling of being monitored and under surveillance, pleasantness, and with lowest grade emotional reaction. In comparison to all the other examples of new media environments presented, the results showed that *Blinkenlights* managed to be the best graded example in creating dynamism of space and the worst graded in aspects of using technology as an artistic medium. In terms of impressions, in comparison to other examples, it was graded as the least able to produce emotional reaction and pleasantness. In the part of the questionnaire in which it was demanded from the participants to point out an example that was most interesting and likeable to them, two participants made their mind for *Blinkenlights* project, both of them male. In another part, where it was demanded from the participants to connect a certain example with a certain impression, *Blinkenlights* had the most votes of all examples, for enabling a feeling of fun, after which also most votes for generating a feeling of surveillance and control.

The results showed that this modality of screen media use in space is most successful in the aspect of generating dynamism of space. By adding light effects and virtual layers of interactivity and media content, static and uncompromising built architecture became dynamic and fun. The participants of the survey didn't consider it to be an emotional artistic peace, but it wasn't intended to be. The peace is successful in creating dynamic public space which is exciting and fun for people to use, with elements of unsuspected and unpredictable behaviour. This simple, low-res concept, a bit more technical than narrative, from survey inquires, both written and verbal, turned out to be more liked by male participants, which may lead to the conclusion that this kind of aesthetics and concept is more familiar to male than female thinking, designing and likings of space. It is interesting to notice that the aspect of surveillance acquired average grade (average ranking 2,84 out of 5) although not any part of the concept, or technological realisation of the piece, used any of the surveillance techniques. All content presented on the facades was voluntary and consciously provided by participants. This may indicate, that even today, when we use screens as amusement media, people are subconsciously still aware of its military and surveillance origin, and possibilities it can offer for surveillance in space. Besides the effect of surveillance, this modality of screen media often generates an effect of speeding up the space' – creating the impression that time runs faster. This kind of effect, that presence of mutable and changeable surfaces generates, leads to feelings of constant instability and fluidity of space, which makes people evaluate it as not so very pleasant.

Another example of screen media environment shown to survey participants was the VR environment *Osmose* by Charlotte Davies, a classic of a genre. This example use screen media in a completely different way, and has completely different goals. It generates virtual and cuts off perception of the user from the physical reality. It uses bodily movements and functions for generating, but also navigating through virtual environment. The result is immersive and dreamy like fluid environment in which subjective relation to space is highly present and experience of space is personal. As best graded aspect of the space participants named crating illusion, after which followed, respectively: technological conception and realisation of space, dynamism, narrative aspect of space, its relationship/interpretation of natural environment, the use of technology as an artistic medium and finally, participation. The highest ranked impression that presented VR environment produced was excitement, after which followed fascination with the use of technology, surprise and pleasantness. The lowest ranked were emotional reaction and feeling of presence of surveillance and control.

In comparison to all the other examples of new media modalities presented, the results showed that *Osmose* managed to be the best graded example in creating powerful illusion in space and wasn't worst graded in any aspect. In the part of the questionnaire, in which was it demanded from the participants to point out an example that was most interesting and likeable to them, none of the participants made their mind for *Osmose* project. In another part, in which it was demanded from the participants to connect a certain example with a certain impression, *Osmose* had most votes (respectively) of all examples, for enabling illusion, feeling of control and surveillance, creating fear and worries. It had no votes for evoking optimism, pleasantness, relaxation and safety.

The results considering the way people react towards VR environments showed that, as expected, the aspect which is dominant is the creation of persuasive space of illusion, which produce excitement and fascination as main impressions. It is interesting, that from given options, participation was the lowest ranked aspect, although VR environments virtually don't exist without users' immersion, cooperation and movements. From this kind of results, the conclusion could be that the form of the participation in VR environments – immersion, is still not seen as a position of control and active participation of the user, and is more perceived in a passive way. This kind of participation, and main concept of VR environments – complete immersion of perception and senses, while being cut out of reality, makes people feel excited, but also worried and confused. An assumption could be that worries and fears come from not clear set of rules of behavior in new type of space, in which boundaries of virtual and real, body and

space are blurred. Also, a question of control in VR environments – who has it – and how it is distributed between the user and the environment, is a complex issue that can be perceived as troubling and worrying. Movies like *The Matrix* (1999) deal with similar issues of how drastic virtual environments can become in terms of controlling mind and the body. On the other hand, if we don't think about control issues in apocalyptic way, we can perceive virtual environments as offering exciting and new possibilities for architects to design fairy-tale like spaces, in which ordinary limitations of design don't exist.

## CONCLUSION

Screen media spaces are specific type of emerging and developing architectural environments. These types of environments are based on some principles and concepts of new media, and more precisely screen media. Those principles and concepts are interactivity, participative and real-time design, expanded virtual and composite spaces that allow telepresence and inspire post-human theories. Screen media environments have adopted the aesthetics of the screen – it's mutable, changeable and layered features, as well as both – the aesthetics of spectacle and the aesthetics of simulation. Depending on the modality of screen media used, we can identify both, environments of decorative and spectacle representations, or environments of pure simulation. The aesthetics of screen media environments is also very relational, so in designing, one should always have in mind the subjective impressions and the effects screen mediations are going to produce in space. Designing screen environments require skills wider then are nowadays usual for architects. Similar to lighting design, one should have broader knowledge and broader skills, spanning all the way to psychological issues. To create both media and architectural space, in which relations between elements are carefully planned, but can be changeable in real-time, a person must understand both media and architectural logic that these kind of spaces have. From media facades to VR environments, all screen media interfaces follow the logic of new media which is radically changing nowadays architectural practice. Architecture is expanding its boundaries in all aspects, due to great representational powers of ubiquitously present computer technologies. From being a portal into another alternative space to becoming this alternative space itself – a three-dimensional, representational, illusionary space of virtual reality, screen media environments are still a developing category of design in architecture. These environments arouse excitement of people and society, but also worries and fears from all the instabilities, control issues, blurring boundaries, mutability and effect of acceleration of space and time. In screen media environments traditional architectural values, design techniques, characteristics of elements, but also expectations of space,



have radically changed, mostly towards highly participative and interactive concepts. In virtual reality environments, data/information space finally match in scale and collide with the real one, creating a reality that goes beyond physical. These kinds of environments rely on new sets of rules, and so does their architectural design.

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