TRANSDISCIPLINARITY NEW TREND IN ART, SCIENCE AND TECHNOLOGY

Joanna Montgomery, Pillow Talk

Dominika Sobolewska

Usman Haque, Scents of Space

New quality of space in the face of transdiscyplinarity and new technologies

"Today's concept of space comprises more movement and traverses beyond the visual space towards the much deeper sensual space." **[1]** *Edward Hall*

Contemporary reality, where the interdisciplinary exchange is a commonplace, is a period of prosperity for the artists to create new quality of space. One of the outcome of such exchanges are interactive spaces which are built on the grounds of art, architec-ture and design. Such environments are often results of the collaboration of architects, artists, designers and other essential experts. Sometimes there are also programmers, robotics specialists, and even biologists, mathematicians, chemists, and physicists on the project team. The architects and designers, by adapting the strategies and tech-niques developed on the grounds of new media art, partially become artists them-selves. Some of them even take another step forward. By following the newest trends in interaction, they create hybrid spaces whose behaviour resembles mechanisms cre-ated in other fields of science

and even live organisms. The ever growing expansion of new forms of communication in modern technological reality caused the emergence of new types of spaces, time, identity, lasting, or availability. It constitutes a challenge for the artists-designers, but also it is a new room for manoeuvre.

The sensory character of responsive and interactive spaces

"A work of art is no longer a painting, a two dimensional window to the world, but becomes a door to a multisensory event [...]". **[2]** *Peter Weibel*

"I treat the media as an elongation of our body, more precisely, of our sensorium and communication devices". Kurt Hentschlager

Contemporary artists-designers are, as stated by Gene Youngblood describing the computer revolution in the context of cultural phenomena, so called artists of New Renaissance. They go beyond the historically shaped territories, belonging to the intel-ligentsia with the humanistic background on the one hand, and die-hard scientists on the other. It is also symptomatic when concerning the

related fields of design and art. What brings these disciplines together is most of all the fascination of new technologies and various implications coming from this fact. Their interest in the interactive aspect of creating artefacts is particularly curious. It is probably connected to the possibility of triggering a wide spectrum of stimuli on the spectator.

A good metaphor of this phenomenon is one of the scenes from the film *Dreams* by Akira Kurosawa. The story *Crows* shows a situation where the protagonist looking at Van Gogh's painting finds himself inside it. Gaining the direct contact with the already three-dimensional landscape, he sets the crows in motion.

The presented motif serves as a good example of the fact that the urge of crossing borders between the visual and the physical is not strange to a human being. Although there were many attempts of crossing that border, for example illusory painting, three-dimensional photography or happening, it seems that only now it is entirely possible.

The dream of finding oneself inside a painting, breaking the wall between the spec-tator and the piece of art, has finally lived to see the times when all our senses may traverse across invisible barriers, experiencing all the aspects even from a remote envi-ronment. "It can be said we are dealing no longer with engaging one's imagination, but rather the senses. The multimedia perception once more engages

[1] - Hall, op. cit., p. 122.
[2] - As cited in P. Zawojski, O sztuce interaktywnej. Available at: <http://www.fil.us.edu.pl/film-i-media/zawoj/PZsztint.html>, [access: 01.06.2012].

the whole sphere of human sensuality, with an unprecedented intensity." Interactive multimedia open up endless possibilities when it comes to intensifying human experiences derived from meetings with art or architecture. It seems though that the biggest room for manoeuvre is offered by interactive spaces.

One of the most significant works in Poland, characteristic of this area, is *Intuited Space* (1996) by Krzysztof Mazur [3]. The artist's main thoughts revolve around shaping a new sensitivity for experiencing, decoding, and understanding of medialized environment. His research also focuses on the user who is the centre of the experimental zone. The presence of a person moving around the space activates its specific stimuli. These sensations influence the users, teaching them a specific receptive sensitivity of the traversed area. For example, they can decide which of the sensations they would like to experience by following a specif-ic path. Here, the communication is in the user's virtual shift into the sphere of simulation and imagery.

Rafael Lozano-Hemmer, Pulse Park, Madison Square, New York

Today such actions have made a huge leap forward. By adapting more and more of new areas of human creativity, they became basic creation methods not only for artists, but also for designers. Interactive spaces are becoming an indispensable part of our reality. From the historical point of view, before they were adapted by architecture and design, they were mainly used in the media art. With time, the ambition of designers and architects led them to reach out for the same strategies, transforming architecture (with all its elements) into a medium changing in real time. Accompanied or inspired by art, they started shaping the spaces of new quality, augmented by the element of human activity, naming them smart environments. These augmentations have grown, leading to an even wider sensory relation with our environments. "Electronic media change our use of sensuality". [4]

Modern designers in their creations strive for uniting a human organism with the environment around him, ensuring the user a direct and individual experience of space. According to these guidelines, the director of Rhode Island School of Design in Providence, USA, a graphic artist John Medea described the modern designers as hu-manized technicians, trying to make technology not only simple in use, but also closely connected to our bodies and senses.

Following similar principles, Philip Beesley designed a rather peculiar

[3] - Artist's web page: < http://www.interact-ive.legal.com.pl/>, [access: 31.05.2012].
[4] - Pakuło, op. cit., p. 14.
[5] - Philip Beesley: Hylozoic Ground, prod. Vernissage TV, Italy 2010, 5 min. Available at: <http://www.youtube.com/watch?v=v86B9Nz_LVU>, [access: 31.05.2012].
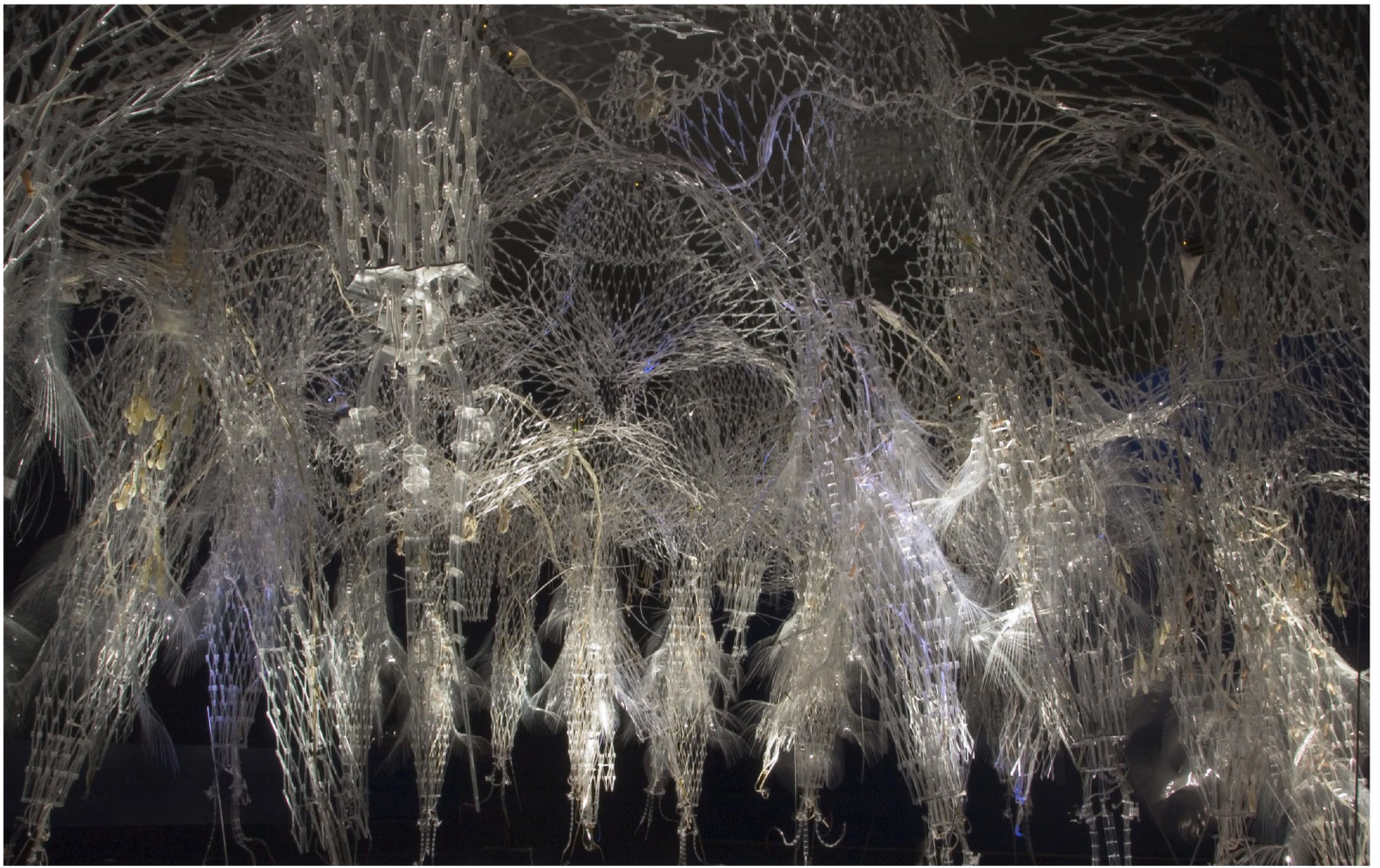
Philip Beesley, Hylozoic Ground

piece of ar-chitecture *Hylozoic Ground* **[5]**. By incorporating Medea's ideas, he tries to answer the following questions in his project: Can architecture be a living organism? Can it be aware of our presence? Can it communicate with us? Can it take care of its users?

The spatial installation created by Beesley is an attempt to bringing the physical spatial structures to life. Its form is nothing else than an organized network, a geotexture in-creasing the sensation of the presence of an artificially created life. A delicately weaved landscape construction is equipped with an array of sensors which allow for triggering processes resembling human reflexes in its structures. The coral reef-resembling hylo-zoic formation is able to breathe, move its individual elements and react to a presence of a person in a peculiar way. It is something more than just architecture. Apart from the traditional function as a shelter, the installation

allows full immersion in its organic nature. As stated by the author himself, its strong immersive properties allow the user to touch the very edge of the experience.

Another example of a piece of art which in a similar vein tries to connect our bodies with the surrounding space is *Melatonin Room*, a responsive environment, realized in 2001 by Swiss architects Philippe Rahm and Jean-Gilles Décosterd. **[6]** The room is able to produce two kinds of climates. The first one, generated with the use of electro-magnetic waves, inhibits our melatonin production, which makes this environment a physically and chemically exciting place. The other one is created with UV light which increases the melatonin production in human body. Users situated in this room be-come sleepy.

Such space significantly influences our mood. Although the generated

signals cannot be perceived physically, they are received in the psychological aspect. Some other principles were used in another responsive space installation by Rahm and Décosterd. It was *Lucky Mackintosh Contemporary Art Gallery* realized in 2004. It is a thermal space divided into such functional elements as library, office and showroom. Built of a pipe network heated to various temperatures and air systems, it adjusts its individual elements to the user's temperature needs. The designerstuned the temperature levels to the activities done by the people in the room. For example: the sitting zone heats up to 21 ℃, the gallery to 16 ℃, and archives to 12 ℃. The tem-perature fluctuates according to the season of the year. During sum-

[6] - Bullivant, Responsive…, op. cit., p. 70. In the realization of the project, apart from the designers and contractors, also the Psychiatric Hospital in Basel was engaged.

mer, it is 18–30 °C, and in winter, 12–21 °C. The thermal character of the space, opens it to the corporal, direct contact with a hu-man. Aside from the functional values, the authors also planned an original way of perceiving of the interior. It happens through the prism of users' experience, on their own skin.

In a similar, yet more complex way, the designed environment was treated by Haque in his project entitled *Scents of Space*, realized in 2002. It is a three-dimensional hybrid composed of so called hard and soft space. The hard part refers to its physical side, and it is composed of elements typical to architecture, such as: walls, floor or ceiling. The soft aspect consists of various stimuli: thermal, acoustic, olfactory, coloristic, and electromagnetic.

Public, private, common space and the notion of distance in the face of interaction

"An ability, characteristic only of a human being,
to perceive oneself in relations and from a distance
and closeness builds the spatial consciousness,
and also the feeling of being open
to this space, which results in a feeling of
emptiness and the need to fill it out. [7] René Berger

Contemplating an interactive environment, one needs to think about its most frequent applications. Art and design are dependent on two rudimentary kinds of space used by mankind. That is private and public spaces. There is a rapidly growing tendency in the modern interactive

[7] - As cited in: Kita, op. cit., p. 30–31
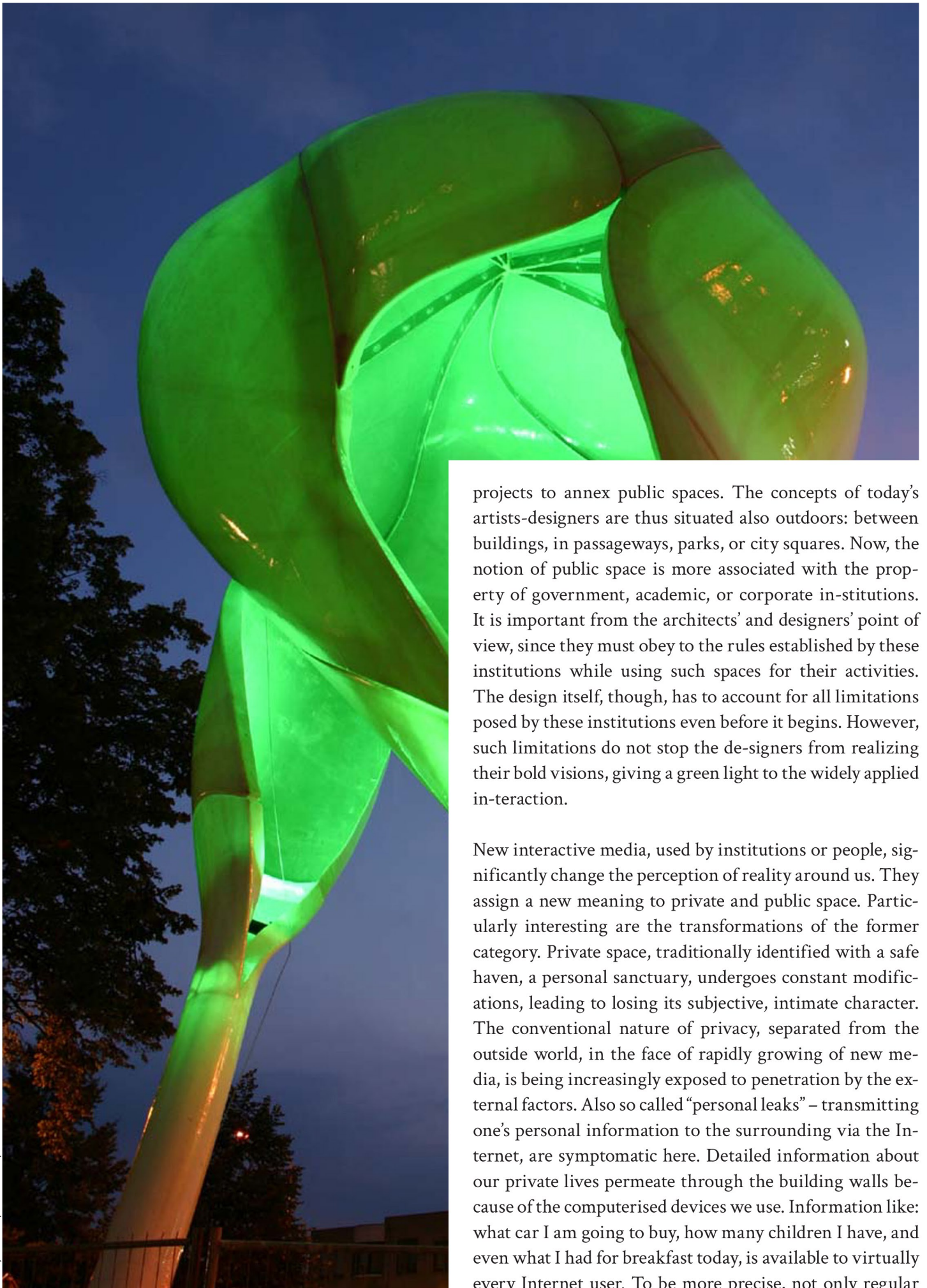
projects to annex public spaces. The concepts of today's artists-designers are thus situated also outdoors: between buildings, in passageways, parks, or city squares. Now, the notion of public space is more associated with the property of government, academic, or corporate in-stitutions. It is important from the architects' and designers' point of view, since they must obey to the rules established by these institutions while using such spaces for their activities. The design itself, though, has to account for all limitations posed by these institutions even before it begins. However, such limitations do not stop the de-signers from realizing their bold visions, giving a green light to the widely applied in-teraction.

New interactive media, used by institutions or people, significantly change the perception of reality around us. They assign a new meaning to private and public space. Particularly interesting are the transformations of the former category. Private space, traditionally identified with a safe haven, a personal sanctuary, undergoes constant modific-ations, leading to losing its subjective, intimate character. The conventional nature of privacy, separated from the outside world, in the face of rapidly growing of new me-dia, is being increasingly exposed to penetration by the external factors. Also so called "personal leaks" – transmitting one's personal information to the surrounding via the Internet, are symptomatic here. Detailed information about our private lives permeate through the building walls because of the computerised devices we use. Information like: what car I am going to buy, how many children I have, and even what I had for breakfast today, is available to virtually every Internet user. To be more precise, not only regular

Rafael Lozano-Hemmer, Pulse Park, Madison Square, New York

users, but also various institutions, including the government organizations can access this information. Our space, be it private, physical, or digital, is not ours anymore.

This fact, after all unavoidable, is acknowledged by modern designers and artists. The situations described above, are a pretext for criticizing the situation, polemicize, or provoking the audience. An example of that is, described in the previous chapter, a spatial manifesto *Access* by Marie Sester who directs our focus to the problem of persis-tent monitoring.

Some of the new media creators use the breaking the barrier methods for smuggling their artistic manifestos into some not easily accessible places. A good example is the activist vehicle *Graffiti Writer* realized in 1998 by Institute for Applied Autonomy. The remotely controlled vehicle is used to write social or political-themed mes-sages in highly controlled spaces.

There are also creators who incorporate their actions in the context of the general access to private space, using the fact that it is now easy to establish connections with users living in specific areas, and subsequently building networks between even the most remote places.

An interesting example is the 2004 project *Hole In the Earth*. **[8]** The project developed by Japanese artist, Maki Ueda, with the collaboration with Center for Visual Arts in Rotterdam, was a lyrical provocation for its users. The concept was based on a virtual connection between Indonesia and the Netherlands with the use of so called "video hole" localized in Bandung and Rotterdam. The hole in the ground was equipped with a high-class video capture and transmitting devices, an LCD screen, camera, micro-phones, and speakers. All of it was covered with a plane of glass. The real-time trans-mission of the people taking a look into the holes on their respective ends allowed for something more than just a video-conference. The engagement of the audience was obtained due to a specific, poetically arranged context of placing the installation in the ground. It is a good illustration of a form of victory of an artist in the battle with geo-graphic distance.

Such triumphs, scored thanks to new network technologies, are tempting also com-mercial designers. One of the most spectacular example is a project realized in 2008 by Joanna Montgomery in Scottish Duncan Jordanstone College of Art and Design

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[8] - Haque, Distinguishing Concepts…, op. cit., p. 29.

[9] - Webpage dedicated to the project: <http://www.littleriot.co.uk/>, [access: 31.05.2012]

enti-tled *Pillow Talk* [9].

It is a concept illustrating a poetic and romantic approach to technology and network connections. The whole idea is based on sensors worn by the pillow owners while go-ing to bed. The sensor located just below the chin communicates wirelessly with the pillow, so when one person goes to sleep, the other person's pillow starts to glow. Up-on the physical contact with the soft surface, the user gains the ability to listen to the heartbeat of the person falling asleep in another location. New media show here an exceptionally personal, sensual face. It is connected with the more and more common phenomenon of adding them to even the smallest areas of human privacy. Our relation with the surrounding and objects in it transforms towards non-material connections. Our correspondence is now digital, airplane tickets are in a form of digital tags, money becomes virtual. The effects of mobile communication changed our perception of local-ization of geographic distance.

The examples above illustrate that the new media artists, being aware of this state of affairs, are able to efficiently shorten the interpersonal distances. One of these artists is Tobi Schneidler who constructively addresses the issues of transformations taking place in the public and private spaces. The project *Remote Home* realized under his su-pervision, is an excellent example. The communication system included in the de-signed environment expands the idea of single apartments by multiplying its virtual range to two living places. Remote Home is an apartment existing in two different coun-tries at the same time. Its floors, Berlin and London ones, and elements of interior are connected with the use of digital networks. The aim of such design of a living space is to elim-inate the interpersonal distances. It becomes possible thanks to a virtual co-experiencing of simple domestic activities by the users living in both localizations.

The house has a function similar to a mobile phone, allowing for sharing friendship in a more spatial, large-scale aspect. In both localizations, the sensors in the furniture and home appliances detect the informa-tion about the residents of the other counter-part. These are so called impressions sent between the two poles through network. It is possible to see the impressions on the other side with the help of the objects which are fitted with **h**aptic and kinetic devices and special light installations. For ex-ample a per-son sitting on a bench in his living room in Berlin will cause its counterpart bench in London to change shape as well. It is a subtle, oneiric accentuation of one's presence in the given moment during a given activity. It can be said that the house in a symbolic way expands its "usable area". With the help of the tactile and sensory-activated pres-ence, it allows friends, who are living far from each other, to stay in touch.

Remote Home through a synchronic juxtaposition of two worlds of experiencing, it initi-ates changes in the individual belief of private space, which today is understood not only in its physical aspect, but also in a digital one.

The composition of the real and digital space matter is one of the most difficult crea-tional challenge. It seems that Schneidler found an appropriate method. New technol-ogies, although ubiquitous in his creations, are not visible. All kinds of control signals, radios, sensors, motors and computers are connected by an invisible sys-tem. He directs the future designers towards the necessity of perceiving information technology not only as a

Philip Beesley, Hylozoic Ground

propeller mechanism, but also as an possibility-abundant structure which fuses into space.

Schneidler's work can be characterised by three levels of effects and three kinds of different creative processes. The levels characteristic to the obtained results are: per-sonal, architectural and translocational. The creation method-ologies revolve around: concept, interactive prototyping and final realization. His methods, used for making such endeavours come to life, are an important model for today's creators of interactive spaces. As emphasized by the author – the project's value is in its simplicity. The goal of the in-teractive design is not in intelligent technologies per se, but rather spaces being intermediary devices in meeting the user's expectations.

His point of view has a significant influence on the per-ceiving of newly emerging phenomena, contributing to de-ciphering the design algorithm, hidden in the media con-trolled space. Actions of such creators as Schneidler take their part in forming of a new paradigm of perceiving the reality.

As it is proved in the discussion above, the blurring of boundaries between public and private spaces is sympto-matic of the modern reality. It is caused by a new element of human environment. What I mean is the peculiar, invis-ible face of interactive spaces. This phenomenon resembles Japanese ma, so called third space, Berger's passageway **[10]**, or the already mentioned in the part on intelligent archi-tectural systems, secondary environments.

The main matter here is the so called common space, connected with the activity of digital media and wireless devices. It is because of these factors that we are able to transfer the public zone to the private one and vice versa. It is a modern, technologized version of the Roman Forum, an area used by the Ancient people to discuss various social matters such as politics and economy. This kind of space existed parallel to the public and private space, being con-cretised in a peculiar way. For its character did not have anything in common with the restrictions and prohibitions stemming out of the right to be used by people. This area was rather perceived by the Romans as a space determined by the rights acquired by its users just by being inside its borders. Similar principles may be applied to today's in-teractive space of Internet connections. Net-works users are able to participate in various debates and activities in a forum of their choice. As Krzysztofek states: "[...] home, work, school, state or international environ-ments are

no longer separate. A digital territory emerges, which is a merge of billions of new interactions taking place in a deconstructed and detemporized space [...]".

Meeting places are not an outcome of a virtual journey anymore. They are often ac-companied by sensations of physical reception of the designed space. Artistic concepts in our environment often come to live in the form of tem-porary installations, interac-tively complementing the cur-rent reality.

An example of this is *Puls Park* by Lozano-Hemmer. The project was realized in 2008, Madison Square Park, New York. It was built of a set of light beams situated in regu-lar intervals around the square, shedding light on its cent-ral, oval part. The inten-sity of light was regulated with a sensor measuring the heartrate of the participants. Placed in the Northern part of Madison Square, it invited the passers-by to interact with it. The installation gathered the biometric rhythms of individual people and sent them to the environment in the form of light pulses moving se-quentially around the square. Each user's contact with the heart-rate sensor activated the light scenery. The system's effect is a large scale visualization of the signs of life of a given space. It makes an impression that Madison Square had a heart made of the presence of the users.

Another interesting installation allowing for uninhibited user interaction, realized in 2004 by Dutch designers **[11]** on the main square in Doetinchem, is *D-Tower.*

A 12 metres high, amorphic tower had some interesting properties. The project, apart from the physical construct, consists also from a website **[12]** and a form filled out daily by chosen residents. The collected data aim to assess the emotional state of these people and determine which emo-tion prevails on that day in the city: love, happiness, fear, or hatred. The object stimulated by the information about emotions transmitted to it, lights up in a colour relevant to the given emotion: red, yellow, blue or green.

The fact worth mentioning is that the visual effect of the installation, despite being an embodiment of the de-

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[10] - This way, Berger describes the space phenomenon stemming out from the technologization of our reality (chapter 2.)

[11] - The following people collaborated in this project: Q. S. Serafijn, Lars Spuybroek, NOX-Architekten and v2-lab.

[12] - <http://www.d-toren.nl/site/>, [access: 31.05.2012].

signer's vision, due to the changes of the lightning colours, it does not have a definitively stated, closed form. The main goals of the authors are fo-cused mostly not on the final characteristic of their architectural creation, but on its constant responsive activity.

Their concept includes a peculiar scenario: handing over the final phase of project realization to the users. The dynamic personality of the generated object only becomes significant with the users' active involvement. It is an important aspect of interactive space design. The artist's creative vision is co-designed and loosely interpreted by the invited audience.

TRANSDISCIPLINARITY- contemporary civilizational and cultural phenomena

What characterizes today's reality is a return to the Greek techne identified with both crafts, art, technology and the skill itself [13]. This is by no means a tendency from recent years, but rather strengthened by the intense development of civilization, the result of postulates already announced at the beginning of the 20th century.

One of the initiators of restoring the old meaning of techne was Walter Gropius. In his lecture in 1923, *Art and Technology: a new quality*, he drew attention to the values that flow from the synthesis of art, science and technology [14]. He dreamed about ubiquitous aesthetic functionality for many users. It is thanks to Bauhaus' achievements that attempts at multidisciplinary approach to teaching were born, where design was to obtain the status of artistic activity [15].

Today, the impact of technology on art and design is even stronger and more obvious. Initiated in the 1960s, it created a solid foundation for the birth of the so-called New Renaissance. The

ubiquitous occurrence of new media, simpler technological solutions with accompanying software, give new room for ma-neuver when it comes to creative activities. Design, art, science and even engi-neering are approaching each other in search of common areas. Targeted on multidirectional cooperation, they constitute new patterns regulating both artis-tic and scientific strategies, as well as all activities related to new technologies used both in one and the other area. Inspired by each other, they often change the point of view of a given issue. This phenomenon can be called intellectual digestion, and to confirm

[13] - Krzysztofek, dz. cyt, s. 24.

[14] - M. Oslislo, Old and New Dreams, w: Kody McLuhana…, dz. cyt., s. 230.

[15] - Krzysztofek, dz. cyt., s. 25.

[17] - K. Pakuło, Interaktywne przestrzenie – pomiędzy sztuką, technologią i nauką, w: „Arteon" 2011, nr 5, s. 13

Philip Beesley, Hylozoic Ground

its presence on the ground of contemporary scientific theories it is enough to refer to the idea of the *Krebs Cycle of Creativity* developed by prof. Neri Oxman from MIT Media Lab. Referring to the assumptions of the *Krebs Cycle*, it de-scribes the contemporary dependencies between the main areas of human activ-ity and the resulting profits. **[16]** The *Krebs Cycle* is a series of biochemical reactions that are the final step in the metabolism of aerobes, oxygen-breathing organisms. Without it, these organisms would not be able to function. Within the Cycle through the oxidation of nutrients, chemical energy is produced, car-ried by the cell in the form of adenosine triphosphate (ATP) which can therefore be treated as a molecular currency unit for energy transfer. *The Krebs Cycle* is a type of metabolic clock that first generates, then consumes, and eventually (ad-ditionally) regenerates the ATP currency. Putting it shortly, the better the me-tabolism, the better the results.

However, following this trail, moving on to the plane of widely understood multi-disciplinary design, we can assume that the aforementioned so-called intellectual digestion, (often requiring a total change of point of view), carries an invaluable potential for creation. As proof of the validity of this claim may serve the work of Buckminster Fuller, a "versatile anticipating scientist and de-signer", whose "geodesic" dome (developed in 1967 for the American Expo pavilion in Montreal) has played an important part in identifying the third carbon molecule. **[17]** The opportunities arising from the dialogue on art and design on the one hand, and science and engineering on the other, are increasingly tempt-ing not only for individual artists but also larger organisms, such as scientific or commercial institutions.

■ DOMINIKA SOBOLOWSKA

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DOMINIKA SOBOLOWSKA

ARTIST, DESIGNER, ACADEMIC TEACHER IN THE INTERIOR DESIGN DEPARTMENT OF THE EUGENIUSZ GEPPERT ACADEMY OF ART AND DESIGN IN WROCLAW (PL),WHERE SINCE 3 YEARS SHE HAS WORKED AS A TUTOR IN INTERACTIVE SPACE DESIGN LABORATORY. IN THE PERIOD OF 2013-15 RESEARCHER WITHIN THE THEMATIC SPACES DEPARTMENT OF EXPO 2015 AND PO-LITECNICO DI MILANO. THE AUTHOR OF NUMEROUS INTERACT-IVE INSTALLATIONS, EXPERIMENTAL ACTIVITIES AND PROJECTS DEDICATED TO EXHIBITIVE SPACE.