

KATARZYNA SŁUCHOCKA

ORCID: 0000-0002-0492-2761

Poznan University of Technology, Poland

BORYS SIEWCZYŃSKI

ORCID: 0000-0003-0192-7003

Poznan University of Technology, Poland

JAN SZOT

ORCID: 0000-0003-0718-7560

Poznan University of Technology, Poland

WILL VR REPLACE INTUITION?

CZY VR ZASTĄPI INTUICJĘ?

Abstract

Creative acts of designers are coupled with visual representation. Technological progress causes changes needed to meet the challenges posed by customers. Will architects using virtual reality in design processes lose their ability to transcendent perception of invisibility beyond sensual perception? The study of the intuition aspects in design and quality of digital images will help define guidelines that allow the architect to maintain a high professional status, supported by acquiring new skills. Conscious architectural training based on new technologies and know-how of experienced designers are crucial for synergistic fusion of the new and the sustained to give designer's creativity new and unexplored possibilities showing the truth hidden in architectural context.

Keywords: VR, intuition, perception

Streszczenie

Działania projektantów sprzężone są z koniecznością ich wizualizacji, a niosący za sobą nowe narzędzia postęp technologiczny powoduje zmiany w sposobie pracy. Czy sami architekci, korzystający z wirtualnej rzeczywistości, tracą transcendentne umiejętności widzenia tego, czego nie ma? Badania nad aspektami intuicji w projektowaniu, w odniesieniu do jakości oraz sprawności generowania obrazów cyfrowych, wskażą kierunki współpracy, naprowadzając na drogę wzmacniającą autorytet i pozycję twórcy. Kluczowa jest świadoma edukacja architektoniczna oraz umiejętna implementacja nowych technologii, aby poprzez synergię tego, co nowe z tym, co trwałe nadać twórczości projektantów nowe i niezbadane dotąd możliwości, określające prawdy ukryte w architektonicznych kontekstach.

Słowa kluczowe: VR, intuicja, percepcja

INTRODUCTION

The sign under which, by co-optation, these men came together from all horizons, was a belief in the destinies of a truly human architecture, to which they were willing, bound together by friendship, to dedicate all their powers of invention, perseverance, courage, and devotion.¹

Every young architect, starting his/her professional career, aspires to reach that goal to create beautiful, useful and timeless architecture; architecture renowned for its aesthetic values and architecture that promises comfort of its daily use. Convinced of the righteousness of their ideas, architects compile them resorting to a number of interdisciplinary spatial solutions. They carefully track down the innovations that can be implemented into the design process, and, as a result, contribute to the aesthetic looks of their output. The ability to imagine the final effect is the foundation for the vision underlying the ultimate image of the facilities designed. With the walls growing up, the architect constantly goes around the virtual space to make sure they will in the end adopt the right shape and proportions. Walking around the imagined space was once accompanied with the drawing on the tracing paper, today it has been replaced with electronic means (professional software) which allows the designer almost to touch the walls being built and to touch the handles closing the doors of the finished buildings. Just *one click* moves the designer from the real world into the virtual reality that creates a very convincing illusion of reality with the computer-generated photorealistic images. These almost real images tempt us, invite us and often even overwhelm us. They seem almost tangible...

CHAPTER ONE

An architect must often prove skilful in a specific type of “multivision.” For instance, determining the building functions, he/she must use its spatial imagination to see this 3D facility on a 2D plane of a paper sheet as well as on the computer screen. This unique form of intuition, a characteristic feature of the designer’s exceptional skills, predetermines his/her ability to harness space in their designs, which in turn, owing to the competences and imagination of the creator, will not surprise us with random and misfit choices. It will provide the architect with the ability to distinguish between false pretences and the truth during their design work.

A complex design process will always in the end lead to the virtual tour around the newly designed facilities with the investor who often wants to visit their most hidden corners. Overlooking the most often discussed details, problematic issues, technical drawbacks or functional remodelling, we should focus on the quality of data communication in respect of the designed building blocks and impressions made by the visualisations and their positive and negative effects. What are the true expectations of a potential investor and user and what is the illusion created via the VR glasses? And finally, what is the status and rank of the creator? To what extent does the architect contribute his own effort and abilities and to what extent is his job done with the software programs?

¹ Le Corbusier, *Karta ateńska*, Centrum Architektury, Warszawa 2017, p. 25.

Subordinating his/her skills to the domination of the electronic tools, the architect potentially becomes a player in the game he himself designed. He/she can move to further and further game stages, falling back on competent use of the electronic media rather than on the intuition and imagination, leaving the only imprint of his/her own creative acts in the form of tailor made changes. And again, *one click*, like a curse, seems to have the designer checkmated. A future investor becomes deeply convinced that since the quality of the computer drawing is fine and the drawing can be efficiently completed in practically no time at all, the designer should make all the modifications with one click on the computer screen in the real time of his/her conversation with the investor about the contemplated changes. In other words, the investor seems to believe that the software can remodel the forms itself. True or false? A rhetorical question. To win the game called designing – or rather architecture – you need a human figure of a player, somebody who is experienced and sensitive to nature and who has the gift of imagination and who is able to address the needs of others in his performance. Somebody who has the right competences to work up an architectural design using the old-style technical pen and who, like a young ambitious professional, can skilfully use the electronic tools. Thus, what is this problem about? Well, it is about the mutual understanding in the joint dialogue between the parties and about the lack of trust put in an architect, which results in the necessity to constantly verify whether the visions of the investor and the designer share the common grounds. As well as to verify if their dialogue is comprehensible – does the architect understand the conception conceived in the brain of the future user and their vision of the future form and function of the building?

To confirm that he/she does, the architect often feels obliged to boast of his/her technological gadgets to demonstrate possibly the best VR image and make sure his/her design is fully accepted by and attractive for the client and that he/she, the architect, is still in the game. Therefore, the client-investor, oblivious of the truly valuable and indispensable professional skills of an architect, deems highly of the computer software, diminishing the role of the engineer trying to make his name through hard work and factual output. Unfortunately, there are quite a few architects with insufficient creative skills in the area of imagination and find it hard to imagine space they are to design, nevertheless, they are computer literate and can easily create virtual spatial reality on the computer screen. On top of that, modern technologies applied in architecture have become more and more complex and it is impossible to design such technological systems without any computer assistance based exclusively on the spatial intuition, with the craft artistry that once used to prevail in the designer's daily work, i.e. on the drawing board and on the tracing paper. Today, we have become used to colourful series of images automatically displayed on the computer screen.

Is the increasing clients' demand to verify the architectural visions a proof of their loss of trust in the architect as a professional? To what extent does the architect trust the conception of the space designed by him? Does he/she trust it fully, absolutely rejecting any thoughts of supporting his 'natural skills' with new technologies or does he/she have a grain of self-doubt, tempting him/her to pursue new technological opportunities? Analysing the software market, we can observe an increasing demand for software solutions in the area of more and more advanced projections of the designed space, coupled with the increased need for their use. There is no doubt that there is an increased interest in the professional design software, this makes us ask the question: "where does this demand/interest stem from?"

CHAPTER TWO

Architects no longer design accounting only for their own tastes (and it is a rare situation if they do!) as their designs are to serve the needs of the investors, contractors and the users. Many times the recipients of technical documentation to fully comprehend the data included in the technical drawing need to interpret the data therein, their interpretation, however, may, in many situations, prove a misinterpretation leading to a number of misunderstandings (who would have expected that the plain broken line would in reality turn out to be a massive binding joist?). Although the designers have a wide range of tools to use to present visualisations of the designed facilities in an analogue form, despite their expertise in the application of those tools, they are unable to manually present the designed space in a 2D form efficiently, even if they copy almost perfectly and realistically the existing status quo, its geometry and chiaroscuro.

In the last 30 years, we have witnessed the development of a number of innovations and new technologies intended to improve the data communication and the level of comprehension of the data content. The development of the 3D graphics is of particular importance here. It offers the viewer the opportunity to see the photorealistic visualisations, similar to the virtual reality images, presenting the images of the designed facilities and their surroundings. They will, however, never be able to fully reflect the truth of the given space or how the users are going to perceive that space. Just recall your holiday – what was your impression of the hotel you selected from a catalogue and was it the same when you actually arrived there. Many times, a sketch of the actual impression from a place may carry more information than its visualisation.

We shall not forego the BIM technology, which is becoming a standard, and which is able to create a virtual twin of the planned building, allowing all the investment process stakeholders to speak a common language, assuring that the truth encased in the design is legible to all those concerned. In view of realistic techniques of space representation, truthful and perfect reflection of the real building in a virtual form as per principle raises no doubts. Investors, aware of the full range of options offered by BIM technology, more and more often require that designs should be submitted in BIM.

Because technology has become more and more accessible in recent years, we can now see an absolute boom of virtual reality technologies whose development started at the turn of the 1980s and 1990s. These technologies allow us today to get totally immersed in the virtual reality of space. Combined with audio stimuli, they are at present the highest level of immersion into *something that materially does not exist*, as such they are particularly effective work tools in terms of the cooperation with the client whom the designer can place inside the design to precisely see what the designer's conception is and who no longer needs to interpret the data provided to him by the designer as he already has access to sicut est data. This way, the client is no longer required to have any spatial imagination or intuition. Virtual reality plays a role of a specific bridge connecting the designer and the client and creating common grounds for their discussions and as such facilitates the development of solutions to problems and the testing of the design options. It, furthermore, underlies a better understanding of the spatial design idea. A flat image or even animated images will be dominated with the author's perception. Each user immersed into the virtual spatial world can individually score the result in the architectural game he/she has joined. In such a case, the truth of the space is a personal and dispersed issue. The ability of your

individual quest for the truth in the computer simulated environment, paradoxically, makes the design look more true and realistic in the eyes of the viewers. Speaking in terms of design comprehension, the viewer moves from seeing the image to being inside it.

The question, now, arises whether this style of work will not impoverish the intuition of the architect and undermine his/her spatial imagination. The threat that in the course of slow evolution the transcendent skills inherent in the aforementioned specific type “multivision” of today’s creators of space will be lost seems quite real. This might especially concern the total dystrophy of the drawing skills in view of the widespread popularisation of computer-assisted visualisation. Many universities in Western Europe no longer test the pencil drawing skills of the candidates in the recruitment process. This may in the end result in the total dystrophy of good drawing skills so far expected from architects as talented drawing artists. At present VR is mainly a marketing tool and still is a technological novelty rather than a standard. It is, however, becoming increasingly popular with young players of video games developed on the basis of the VR technology. Can the increasing interest in VR technologies affect the way the architects will work in future? Will the sophisticated skills characteristic of the designer’s profession being at present in high esteem become standardised and widely accessible to anyone who is computer literate?

We should also analyse the position of the architect if his design work should consist in creating in the virtual reality environment. The conventional perception of an architect holds him/her in this high God esteem of a *Creator*. As God, the Creator, the architect can see up from above, being an entity other than any direct user of the designed space. The space seems some abstract entity to him. The VR technology makes the creator step down from the king’s throne and mingle with other game players deprived of his dominant position, even if he has arranged the game setting. The Creator learns to be humble, understanding the power of the system. It only seems that the system might have defeated him but the issue is not the undermined trust put in the architects but whether we, the game players, can trust ourselves and our own abilities. Modern works of architecture are no longer structures within the theatre stage of life but a complex conglomerate of technology and art. The high complexity level of the technological solutions and the number of aspects that need to be controlled can only be harnessed with the use of computer imaging. Hence, talking of computer imaging, we arrive at the Virtual Reality. In this sense, resorting to the VR technology testifies to a responsible designer who, being aware of his own shortcomings, is able to make up for them using the appropriately selected design supporting tools. Necessity is the mother of invention – this is the main driving force of progress. What is more – looking at the VR technologies as an analytical tool – combining technology with aesthetics, a talented creator is able to perform better.

You cannot put all the blame on the clients, investors or future users of the newly designed space for their inquisitiveness. The fact that they request material evidence for the correctness of the applied solutions and for the desirable aesthetic or functional values of space is nothing wrong. It is only natural. Should the opportunities arise, one should skilfully and efficiently take advantage of them. Virtual technology poses a chance for designing. Taking the advantage of the synergy of technology and human sensitivity can only render optimum solutions. Thus, the clients’ requests do not stem from their lack of trust in an architect but rather from the available technological opportunities. The only difference is that today we have a much higher access to such technologies.

CHAPTER THREE

The question concerning the justified grounds to fall back on intuition in architectural design is often asked in the context of design courses offered to students at the Faculty of Architecture. Is intuitive perception of space necessary for the professional practice? Can it be replaced with 3D virtual designing? With the question comes another, even more intriguing, namely, in the span of all those past years, wasn't it the other way round, did not the architect's intuition make up for the lack of VR? This discussion is particularly up-to-date now, when we are faced with external circumstances that prevent the organisation of the drawing entrance exam which, as per the assumption, is to verify the ability of spatial perception. It will be interesting to compare the educational outcomes of students accepted following the recruitment procedure that included the drawing exam and those accepted without it.

The digital tools used at present in professional practice and the didactic process (education) offer minutely precise drawing and modelling of the designed facilities and work well with the PC keyboard and the mouse. Introducing a new perspective from the 'inside' may require the adaptation of the software to maintain the functionality of the tools and their precision. This is, without doubt, a big challenge and until it is solved, the VR assisted designing will be widely applied only at the stage of conception. Nevertheless, popularisation of this novel at present manner of perception and shaping architecture among the young, prospective architects at an early stage of their education could prove a tool efficiently verifying their operative ability, sensitisation level as well as the manual drawing skills. In either case the technology is a useful prosthesis allowing to express the names of the effects of forms created in our imagination.

Digital tools, which do not prevent the use of other options, can potentially better reveal the value of the creative work piece, in other words, we could view them as serving the function of "diamond polishing mills." VR makes the work rather more demanding. Virtual reality can make up for the deficiencies of our imagination if used by appropriately shaped and developed creative mind. It can then render much better effects and is an opportunity for an architect to enhance his/her professional status. His professional status could even rise higher if the users of the newly erected buildings, including those knowledgeable in the same specialised tools, could see the difference between architectural facilities designed with the use of digital tools by a complete layman and a qualified architect.

Virtual tools suggestively translate the message inherent in an architectural piece of work, depriving the stages of their conception of any mysterious aura. Quick, visual and legible design variants pose a threat of enticing the investor to reduce the role of an architect to the system operator and 'executor of the investor's will', who as such might often diverge from good professional practice. Understanding the dimensions and functions of the designed space cannot be equalled with designing the space aesthetically and functionally. It is the architect's artistic taste that positively contributes to the space, even if the investor fails to understand the reasons. Insisting on useless solutions characterised with poor aesthetics only for the reason that one apparently claims to know what they will look like might result in unexpected and unpleasant surprises. An average investor usually fails to see any difference between correct and incorrect solutions. Moreover, computer technologies have brought about a feasible risk that the client (investor) might come to the conclusion that there is no major difference between him (the client) and the architect since designing is so simple (you can see everything)! This question of whether it makes a difference who operates the computer

system has been alluring the client into the elimination of this ‘wasteman’ (architect) from the design process. In Poland and probably in other countries as well, you can hear that anyone today can be a doctor and an architect. Yet, no system can take over the initiative of a professional founded on the solid grounds of his/her talent, experience and comprehensive approach to designing. In this supply chain in the field of architecture, VR should be viewed as a tool which, if purposefully and skilfully used, can help the architect to persuade the investor to see the reasonable grounds underlying the proposed solutions and to engage in the moderated dialogue to the mutual benefit of the parties. Faced with the threat of technology appropriating more and more attributes of professional drawing skills, the architects need to excel at creativity and professionalism to make the investor believe that no technology is able to replace them.

CONCLUSIONS

Technological progress is a fact you cannot deny. An innovative architect, understood as the architect open to changes, will be aware of that. The thesis that changes in the surrounding world affect the manner of work of an architect and the interactions with the architectural work requires no proof. We also know that there are clients who expect more and more creative and immersive presentations of the designer’s ideas. The role of an architect, as an expert, is to find a balance between technological innovations and his own professional knowledge, avoiding the extremes, i.e. absolute refusal to use any novelties or total reliance on the technology. Even the most progressive artist needs to act within certain traditions. What is more, the traditions are the starting point of his/her work as an artist, irrespectively of how far he/she will next diverge from them. Only the synergy of experience and openness to new ideas is able to move us forward to a new quality. Therefore, the more VR technologies used in designing, the more evident the actual quality difference between their users – professional designers and clients. The know-how, creativity, experience and in-born and acquired in professional practice intuition will always testify to true designing. Proper teaching methods adopted in the process of architectural education stand a good chance of guaranteeing the most successful performance.

Before throwing a stone he first gets the feel of it, turning it over and over until he has the right grip on it, and then weighing it in his hand. After doing this often enough, he is able to tell what a stone is like without touching it at all; a mere glance is sufficient.²

Thus, sensing architecture *in situ* for the VR visual stimuli to ideally complement the sensory imagination, developed in the course of direct and purposeful exposure to architecture, is an important prerequisite of the entire process.

References

- [1] Asanowicz A., *Zrozumieć VR. Geneza rzeczywistości wirtualnej*, Architecturae et Artibus, 2011, vol. 3, no. 4, pp. 5–12.
- [2] Boehm G., *O obrazach i widzeniu. Antologia tekstów*, Universitas, Kraków 2006, pp. 294–295.

² S.E. Rasmussen, *Odczuwanie architektury*, Murator, Warszawa 1999, p. 13.

- [3] Brawne M., *Architectural Thought: The Design Process and the Expectant Eye*, Architectural Press, Oxford 2003.
- [4] Le Corbusier, *Karta ateńska*, Centrum Architektury, Warszawa 2017.
- [5] Kasznia D., Magiera J., Wierzowiecki P., *BIM w praktyce, Standardy, wdrożenie, case study*, Wydawnictwo Naukowe PWN, Warszawa 2018.
- [6] Pallasmaa J., *Oczy skóry. Architektura i zmysły*, Instytut Architektury, Kraków 2012.
- [7] Rasmussen S.E., *Odczuwanie architektury*, Murator, Warszawa 1999.
- [8] Ratalewska M., *Spostrzeganie społeczne i jego znaczenie w procesie komunikacji międzyludzkiej*, Studia Ekonomiczne Region Łódzkiego, 2013, no. 11, pp. 159–168.
- [9] Ruzha Sirmanova, *The future of phenomenological architecture in the context of virtual reality and its effects on the global world, defined by the two-dimensional image*, https://issuu.com/ruzhasirmanova/docs/phenomnology_in_vr_and_the_future_o (access: 05.2020).
- [10] Wunenburger J.J., *Filozofia obrazów*, Wydawnictwo słowo/obraz/terytoria, Gdańsk 2011
- [11] Xingyun Jin, *Virtual Reality in Architecture: Establishing an Immersive Modeling Environment*, University of Florida, Gainesville 2016.
- [12] Zumthor P., *Myślenie architekturą*, Karakter, Kraków 2010.

Authors' Note:

Katarzyna Sluchocka, Assoc. Prof. D.Sc. Ph.D. Arch.

Born in 1967 in Poznań. She is a graduate of Poznań University of Technology where she was awarded Master's degree with Honours. She completed doctoral studies in 2001. Habilitation in 2016. She has been an academic teacher at the Faculty of Architecture of Poznań University of Technology in the Division of Interior Architecture and Industrial Design. Organizer of exhibitions, displays, competitions, participation in interdisciplinary research projects, creative work contributing to personal development, participation in conferences, scientific symposia, outdoor artistic workshops, active participation in organizational works, educational duties related to the educational process, research activities. Her creative work includes the fields of designing, painting, drawing and photography. Her artwork has been displayed on numerous group and solo exhibitions in Poland and abroad.

katarzyna.sluchocka@put.poznan.pl

Borys Siewczyński, Ph.D. Arch.

Graduate of Architecture at the Poznań University of Technology, where he currently works as a lecturer at the Institute of Architecture, Urban Planning and Heritage Protection. His scientific interests include computer aided design and virtual architectural reconstructions.

borys.siewczynski@put.poznan.pl

Jan Szot, M.Sc. Arch.

Graduated Architecture on Poznan University of Technology in 2017, where he currently works as an assistant in Institute of Architecture, Urban Planning and Heritage Protection. Enthusiast and researcher of new digital technologies in architecture.

jan.szot@put.poznan.pl