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Prof. Bartosz Jakubicki, Agata Wojtyła-Młynarczyk PhD
Academy of Fine Arts in Wrocław

SCREEN WINDOWS – ACADEMIC RESEARCH ON THE ARCHITECTURAL ROLE OF SEAMLESS SCREENS IN PUBLIC INTERIORS

Art research paper

Translation PL-EN: Ireneusz Sojka, MA

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Abstract

Multidisciplinarity in interior design is no longer only a commonplace but also a necessity. Digital technology, which is in the daily use of the information society, affects the way of designing contemporary interiors, their mental perception and the aesthetic and functional requirements set for them. It is difficult to find an interior without a screen or display today, and these are increasingly becoming a conscious tool, a means of creation in the hands of interior designers, especially in the field of public spaces. This article presents academic research and student projects on the problem of the deliberate use of screens as contemporary windows, their involvement in a compositional game in which screens are openings to another space in the architectural sense. They open the solids and transmit the exterior. The aspect of changes in the social perception of the interior using seamless screens, emitting images adapted to the interior category, expanding the usability and creation of the rooms, was also discussed. Ten student projects were presented, created as part of one research project, proposing different applications of seamless screens, defining their new roles in the creation of specific public spaces. This collection of ideas is a proposal for a change in the treatment of screens as elements of interior furnishings in favor of treating them as one of the integral parts of the architectural composition.

Keywords

screen window, multimedia interiors, seamless screens, academic research, screens in interiors

The screen window as part of the structure and interior space

Seamless screens are increasingly often hosted in public spaces, fulfilling various information and advertising functions, and among them one can distinguish one specific utilitarian and compositional value: the role of the window. This specific treatment of the screen has its own separate characteristics, predispositions and technical requirements. It is a continuation of the architectural idea of combining the interior and exterior spaces, although the external space in this case does not have to be adjacent to the building, and even does not have to be a real space. Increasingly, the screen is treated as a significant part of the architectural composition, not only an element of interior design, but consciously used visual opening of rooms, intentional building blocks of interior architecture, active and glowing planes taken into account from the beginning of conceptual work.

The window is an inseparable element of contemporary architecture: starting from modernism, often so extensive that it takes over the façades of buildings completely. Le Corbusier and Pierre Jeanneret list

horizontal windows among the five points of new architecture. Together with the ceilings, the supports form a rectangular system of openings in the façade through which light and air can travel. The window extends from one support to the other and thus becomes a horizontal window. Unnatural, vertical windows consistently disappear, as do unpleasant posts. In this way, the room is evenly lit, from wall to wall¹.

A similar evolution, although of a different origin, can be observed in the applications of screens in interiors. From a small window of the CRT TV set, the screen has transformed into a luminous material covering entire walls, opening ceilings or floors, an element of active lighting replacing ambient light. The current prevalence of displays and the accustomedness to the information they emit give rise to a new mental perception of the screen. It now seems to make better contact with architecture. It is a part of the overall relations of the interior and not a hegemonic point of concentration of attention as in previous decades. Since the idea of an opening in the wall, the window has also mediated human contact with nature, introduced an extremely important psychological aspect into the interior: living according to the seasons of the day and year and the vegetation of the natural world. In urbanized urban agglomerations it is not always possible to provide the desired views from the windows or any visual contact with open space and nature. On-screen windows then become a justified alternative, a way to move a view from anywhere, importing attractive and cropped landscapes, selected for the composition and specific needs of the interior and the user.

The research project carried out by the E. Geppert Academy of Fine Arts in Wrocław in cooperation with SLX, a company specializing in audiovisual systems, was aimed at analyzing possible and future

1 Le Corbusier, P. Jeanneret, *Five Points for a New Architecture*, [in:] *Bau und Wohnen*, Stuttgart 1927, transl. Łukasz Stępnik, <http://teoriaarchitektury.blogspot.com/2011/02/le-corbusier-i-pierre-jeanneret-piec.html>.

applications of seamless screen walls, understood strictly as windows to another existing space, as visual openings in the structure of architecture.

The taking over the role of the window by the screen plane puts a number of guidelines that authenticate the viewer's realistic impression, such as the compatibility of the perspective and scale of the image with the interior, the fixed point of the camera, proper lighting, limiting the emission of information to the pieces that we associate with the view through the window, the location of the screen in the compositional place of the interior, where you can expect an opening, and other functionalities of the window, such as the ability to preview a given space in real time. It should be noted that these are completely different tasks in relation to a TV, information or advertising monitor, also different than any interface or touch screen.

As an example of this difference, let us use the design concept of the interiors of the foreign language school by Julia Jeziorna, where the screens connect the common spaces of several branches of the school located in different countries (Fig.1).



Fig. 1: Foreign language schools designed by Julia Jeziorna.

Screens in this space allow you to observe a distant, but twin, situation and establish international social contacts between students. Young people in the recreation areas can communicate in different languages with adjacent tables displayed on screens. We have other zones here, for example communication zones, in which there can be a stop to the traffic or a cacophony of sound with many users, so the screen windows are deliberately devoid of sound. Paradoxically, this limitation enriches the forms of contact, because it encourages gestures, telephone contact in front of the screen or passing on social media addresses to one another. In less formal situations, a silent window can be as attractive in establishing contacts as the multimedia-rich teleconferencing technology.

An additional issue of the presented solution is the styling and material compatibility of the neighboring interiors. Well, large screens to a large extent transfer the action of forms, space and atmosphere of the room behind the screen window. One of the ways to integrally connect these rooms is a convergent range of compositional solutions or the use of identical equipment and colors. This gives an impression of coherence and even continuation of the interior space. The next step is to design both the interiors simultaneously to coordinate their mutual impact on each other through screen transmission, not only as the influence of adjacent interiors or the view outside the window is predicted in traditional architecture, but also using impossible assemblies, for example straight from Escher's architectural graphics² or endless extensions that completely change the character of the place, in other words: a collage of any telepresent spaces thanks to a global communication.

Such a distant transfer of space is taking place in Anna Aksamit's project, in which the author proposes a set of screens in the form of sliding wall modules, with direct transmission from a majestic spruce forest. The interior for relaxation provides the option of moving the screens along the black lines of the rails on the ceiling, i.e. the possibility of reconfiguring the planes surrounding the user with a beautiful view (Fig. 2).



Fig. 2: The "Forest Room" by Anna Aksamit.

The optimal layout would assume the placement of four cameras facing the different directions of the world from one point in the forest, filming four panoramas of the same virgin place. On the other

2 M.C. Escher (1898 –1972), graphics *Convex and Concave*, 1955, <https://www.flickr.com/photos/pedrosimoes/739316167761>.

hand, moving the screen walls in the interior would recreate subsequent fragments of the forest, in accordance with the movement or rotation of the wall modules.

A similar dismemberment of the live landscape broadcast was used by Aleksandra Boska in her project of the mountain bike shop. In this case, the screens are to introduce an atmosphere of movement in the open air, slightly revive the technical and mechanical assortment of the store with the dynamics of adventure and images of what traveling cyclists interact with. The screens remind us of the essence for which the store's customers buy equipment displayed in adequate sections of the room (Fig. 3).



Fig. 3: The bicycle shop by Aleksandra Boska.

Horizontal strips of seamless screens scattered around the interior present a shot from one wide-angle camera, filming a mountain bike trail, which ensures the consistency of movement of passing cyclists for the entire room and the sensational effect of the client's presence between the mixed spaces of the interior and the distant exterior. Significant in this project is the method of distributing transmissions into strips of seamless screens, breaking with the aspect ratio scheme of the TV screen, as well as high resolution, thanks to which the precision of imaging is not inferior to the precision of the bicycle components viewed.

The possibility of a complete change in the perception of the cubic capacity of a given space thanks to the screen window is best presented by Iryna Kulaha's design of the nightclub built in a reinforced concrete shelter from the Second World War. The shape of this military building is a cylinder completely devoid of windows, with walls over a meter thick and low floors making a claustrophobic impression. The screens used by the designer imitate a large arched window that shows a panoramic view of New York from a certain height and completely changes the perception of this interior. The object now seems to be an oval observation tower with a huge space open to the viewers, the lighter

because the view is reflected both in the water and in the mirrored ceiling of the interior. The strips of ceiling mirrors and lighting, repeating the roundness of the building, additionally create a visual openwork in the ceiling plane, which eliminates the impression of a large, low-hanging plane (Fig. 4).

In the first stages of the concept, the possibility of placing the camera on a high mast placed on the roof of the building and projecting the panorama of the city of Wrocław, which really surrounds the object, was considered. In this case, a change in only the ceiling of view would be combined with a certain unity of the place, the real environment of the building, closer to the spatial truth. However, the designer decided that the lack of transmission distance restrictions and the presentation from a more surprising location of the camera would be a greater experience for the club's guests and a sensation attracting new customers.

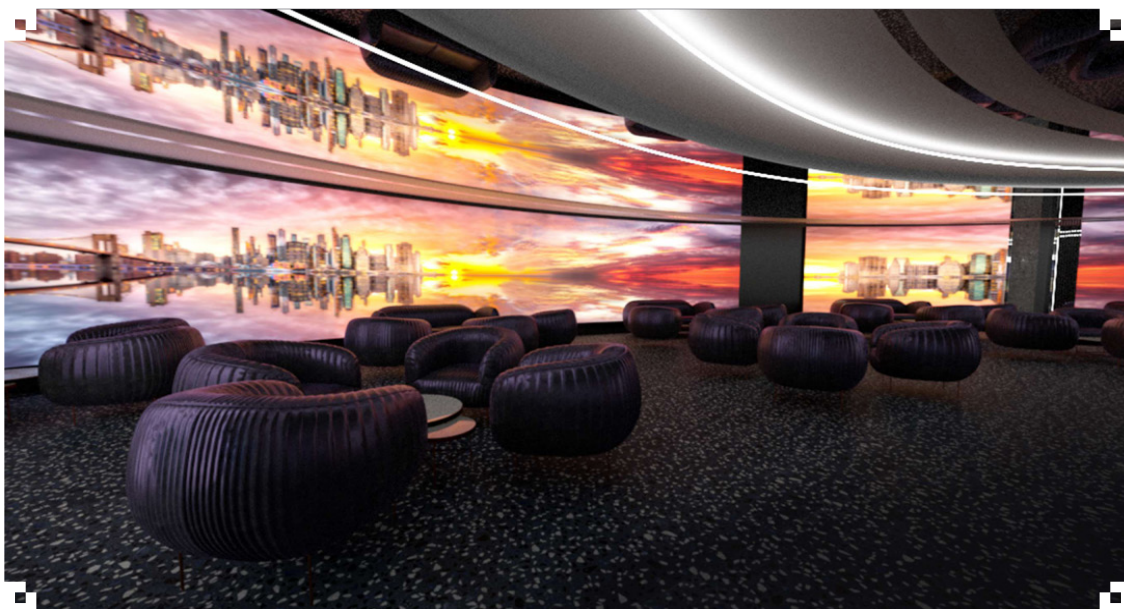


Fig. 4: The club in a former air raid shelter, designed by Iryna Kulaha.

The last example of the innovative use of the seamless screen system is the design of the restaurant with molecular cuisine and a demonstration preparation zone in the central part of the dining room. Designer Julia Hołoś noticed attractiveness of the molecular food preparation processes and decided to provide an opportunity to watch this spectacle to the entire clientele of the dining room. She blinded the circle of windows of the semicircular outer wall of the premises with screens and, in exchange for the view of the yard, she broadcast in real time the image from cameras placed in the canopy of the kitchen island. In this way, the screen windows provide both satisfactory information about the preparation of meals that will soon be served on the customers' tables, as well as diversify the space of the premises with appetizing views (Fig. 5).

A certain looping of the space is proposed in this solution: the moving of one part of the interior by means of screen transmission to another place of the same interior. The dynamics of the cook-scientist's activities, colors and graphic compositions created on plates are copied in parallel on the screens. The yellow color of the table top is a deliberate color dominant, repeating throughout the composition of the interior for consistency and accentuation of the main role of screen transmission in the arrangement. Other materials are the background, also in the case of walls covered with aluminum sheets crumpled like a sheet of paper, which will probably reflect the image of screen windows many times.

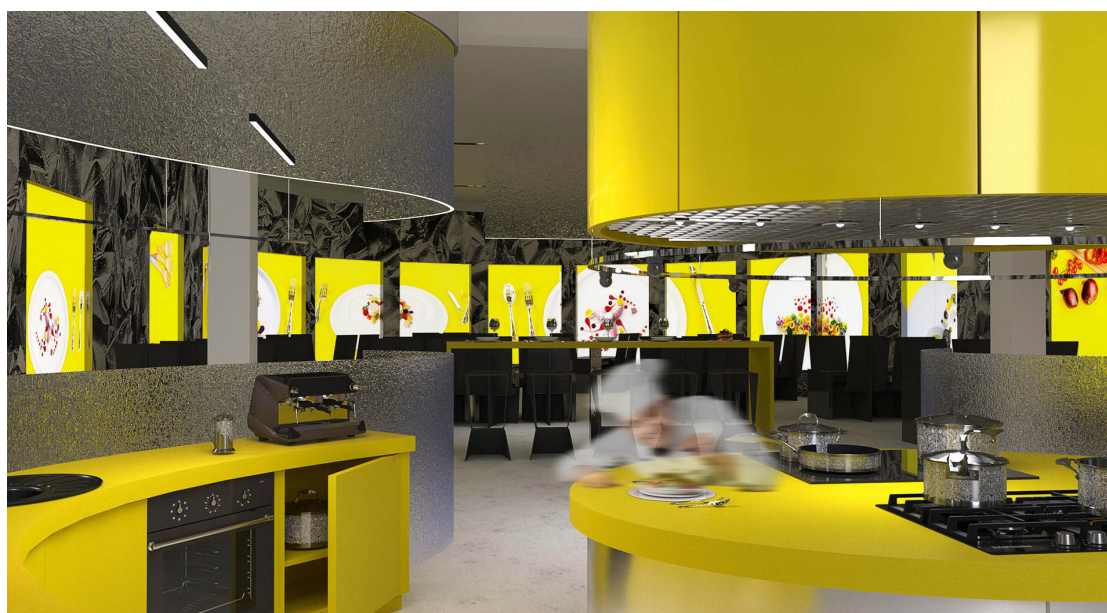


Fig. 5: The molecular restaurant by Julia Hołoś.

The use of screen windows – the social dimension

We are currently witnessing an intensified process of evolution of the role and understanding of multimedia techniques. Associations with innovation and innovative thought of designers proposing interiors containing ideas integrated with new technologies have become much more common. Multimedia communication has become the basis for creating social awareness. In addition to the obvious information motive, there is a need to create forms of entertainment, attractions in a world that, accepting an unexpected period of limitations, is still functioning, suppressing the basic needs necessary for the proper existence of humans.

Elliot Aronson, in his book “The Social Animal”, already 50 years ago argued that people are not passive containers for gathering information and that the way they receive and interpret information depends on how deeply they are involved³. The assumed verification of the perception of the

environment by a person gives consideration to the role assigned to multimedia. The acquisition of transmitted content should take place consciously, the required readiness to receive stimuli, depending on the situation and context, must be assumed to be voluntary.

According to Aristotle, “man is by nature a social animal and that one who does not partake of society is either a beast or a god.” We now have an opportunity to return to this proposition again, reflecting on how modern society seeks to remain united, where it seeks the means to return to cultural and social life at least half-heartedly.

On-screen interactive windows-images, which are increasingly becoming an attempt to satisfy cultural needs, needs of belonging, aesthetic and cognitive needs, have a chance to silence today’s insufficiencies and deficiencies of a person accustomed to a cosmopolitan lifestyle.



Fig. 6: The “Close to Nature” restaurant designed by Wiktoria Wieczorek.

The assumption aimed at meeting the cognitive need was adopted by Wiktoria Wieczorek who, in the restaurant by her design, transports guests to the Amazon forest (Fig. 6). The assumption that the space is complemented every day by a new set of unusual images gives the object an infinite possibility of aesthetic creations. The videos of exotic landscapes are complemented by sounds of virgin forests native to the “lungs of the Earth”. The natural materials used – wood, wicker, living plants – and harmonious colors harmonize with the character of the paintings surrounding the space. The name given to the restaurant, “Close to Nature”, clearly refers to the biggest deficiencies in everyday human life.

A kind of compensation for the lack of the possibility of traveling freely allows, to some extent, to satisfy the cognitive aspirations of man. At the same time, it is an accurate way to create a modern public space. A restaurant of this type, in addition to standard catering services, meets the aspirations of man, satisfying also higher needs.

The union of the human and the non-human with the bonds of technology is driving post-humanism towards trans-humanism. This discourse is based on the assumption that man as a species, by merging with technology, will achieve a higher degree of development both in the spiritual and physical domains⁴.

This claim of Katarzyna Nowaczyk-Basińska, a theatre and media expert, also refers to the role of multimedia in human self-improvement. There is a noticeable trend of directing new technologies to pioneering adaptations, while, at the same time, looking for an alternative role for them, more and more distant from the characteristics typical of the mass media. Students Paulina Smalec and Natalia Piksa, in their proposals to approach the subject, opened a clear correspondence with the opinion of Katarzyna Nowaczyk-Basińska, showing that modern technology currently has an invaluable impact on the physical and spiritual development of man.

Natalia Piksa proposes in her project, “The Mine Zone”, an unusual entertainment in the form of a visit to Polish mines where we can trace in detail the development of the domestic mining (Fig. 7). Although the information provided is of a scientific nature, the form of its transmission, developed based on historical sources, using large-format interconnected seamless screens, allows us to reach for inspiring knowledge without analyzing volumes of literature. Małgorzata Szabacik and Mariusz Ausz thoroughly examined the perspectives of this phenomenon, presenting them in the publication entitled “Multimedia and historical sources in teaching and research” where they highlight

a wide panorama of the possibilities offered by multimedia in historical education and archival work, as well as in the use of the latest IT capabilities, for various forms of sharing historical sources⁵.

4 K. Nowaczyk-Basińska, *Nieśmiertelność – nowy performans kulturowo-technologiczny XXI wieku*, [in:] *Technokultura. Transhumanizm i sztuka cyfrowa*, red. D. Gałuszka, G. Ptaszek, D. Żuchowska-Skiba, Kraków 2016, pp. 63–82.

5 M. Ausz, M. Szabaciuk, *Multimedia a źródła historyczne w nauczaniu i badaniach*, Lublin 2015.



Fig. 7: Educational “The Mine Zone” by Natalia Piksa.

“The Mine Zone” project, apart from the indisputable value of the historical message, gives each user an unusual opportunity to freely walk around selected mines. Selected screens corresponding with the cameras allow you to feel the character of an intriguing, dangerous space, which only a handful of people may actually access.

Also Paulina Smalec uses in her project screens as a medium for transferring knowledge (Fig. 8). The content is addressed to the youngest, proposing an educational center expanding children’s mathematical competences. The planes of seamless screens connected with one another lead to a virtual author’s world based on issues related to the “queen of sciences”. A broad approach to the topic and an offer to deepen the issues through various interactive games is a well-thought-out educational alternative and an interesting form of spending free time. The original aesthetics of the interiors of the premises located in the underground parts of a building boosts the effect of the innovative ideas in its futuristic structure



Fig. 8: The center for Mathematical Education by Paulina Smalec.

The evolutionary impact of the use of multimedia walls on human physical improvement is presented in her project by student Maria Błasiak (Fig. 9). Proposing a wellness center, she offers zones (a fitness room and a salt cave) in which windows created from screens allow you to combine stylized transmission with other facilities branded with this idea. Exercising and relaxing together with friends and acquaintances on the other side of the country or world could be a new form of effective spending of time without having to move physically. The offered concept also allows to avoid crowd, while maintaining a sense of belonging to a selected social group.



Fig. 9: The wellness zone by Maria Błasiak.

Services as an economic activity permanently connected with everyday human life in an accurate way have a chance to derive multidimensional benefits from the use of interactive windows, created by seamless screens.

A completely new concept presenting the use of screens in services is the version of a hairdressing salon where the illuminated are not intended to convey specific content (Fig. 10). The basic assumption of the author, Joanna Grzelińska, was to give the selected walls of the interior an active and variable virtual structure which, in an unobtrusive way, makes this form of spending time more attractive. Mesmerizing abstract shapes do not engage the recipient in a specific action. In this way, the assumptions presented in the project inspire a moment of casual relaxation, rest from everyday life and constant haste.



Fig. 10: The hairdressing salon for ladies by Joanna Grzełińska.

The intensification of the presence of multimedia technologies in our environment makes us aware of the ease with which we currently adapt it to various zones of everyday life.

“In everyday life, we are not yet able to blend so seamlessly with innovative technologies,”⁶ claimed a few years ago Drew Ayers who analyzed the situation in the world of technological novelties at that time. The scientist emphasized that man is able to identify with the virtual world only through film. Today’s situation clearly disproves this claim. Gradually, we accept the deepening dualism of the environment, getting rid of prejudice and distrust of the ever wider range and availability of technological facilities.

Conclusion

The presented examples show the undeniable potential of using seamless screens in interiors. Existing applications of the, not so new, technology will change and expand, mainly due to the decrease in device prices and the increase in the ease of access to any off-shelf screen package with ready-made software for individual customers. This fact means that screen windows are already within the reach of small entrepreneurs, but they have also found their way to design workshops of a large number of interior architects, creative designers with artistic imagination. The presented studio projects are forerunners of the flowering of the use of screens with surprising functions and unprecedented forms, for which manufacturers and designers will have to introduce new names in order to precisely define the

6 A. Drew, *Chimeras and Hybrids: The Digital Swarms of the Posthuman Image*, [in:] *The Palgrave Handbook of Posthumanism in Film and Television*, red. M. Hauskeller, T.D. Philbeck, C.D. Carbonell, Basingstoke 2015, pp. 99–108.

desired functions of screens in interiors, no longer only combining the interior with the exterior⁷. The screen window, thanks to its separate properties, deserves a separate definition, indicating its properties: transmission of another space, specific values for the architectural composition of the interior and intentionally limited and adapted to the room content and image convention.

The social context is significant, which is an important justification for the development of new technologies. The need to reorganize human relations and the change in the form of spending free time have contributed to the expansion of the spectrum of possibilities of screen windows. Society adopts pioneering initiatives with unprecedented openness, which motivates designers to look for new and increasingly more pioneering solutions.

It is worth to follow ideas of young designers because their imagination precedes social needs, the development of technology or changes in customs. It may happen that screen windows will become one of the arrangement standards, a material as popular as wall photo wallpapers or controlled LED lighting, but with much greater creative possibilities for the wide market of public interiors.

⁷ B. Jakubicki, *Wnętrza multimedialne – hybrydy miejsc i przestrzeni*, [in:] *Wnętrze – zewnątrz. Przestrzeń wspólna*, Wrocław 2019.

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