Asmati Chibalashvili

Candidate of Art Studies, Academic Secretary, Modern Art Research Institute of the National Academy of Arts of Ukraine

e-mail: chibalashvili@mari.kiev.ua | orcid.org/0000-0003-1001-4273

Bohdan Tymofiienko

Junior Research Fellow, Modern Art Research Institute of the National Academy of Arts of Ukraine

Асматі Чібалашвілі

кандидат мистецтвознавства, учений секретар Інституту проблем сучасного мистецтва Національної академії мистецтв України

Богдан Тимофієнко

молодший науковий співробітник, Інститут проблем сучасного мистецтва Національної академії мистецтв України

e-mail: tymofiienko@mari.kiev.ua | orcid.org/0000-0003-1146-1948

Pertinent Concepts of Virtual Art Актуальні концепти віртуального мистецтва

Abstract. The paper studies the virtual art phenomena emerging as a result of active interplay of digital technologies and art that started in the mid-20th century. This interplay resulted in significant changes in the techniques of the creative art, as well as in the appearance of new trends and genres of art. In addition, the audience's perception of the work of virtual art has undergone transformations also. The latter is related to interactivity as an integral component of virtual art. At the same time, artworks have different levels of interactivity-from the traditional passive perception, e.g. in the format of virtual museum tours, to the active participation of the viewer in the creation of the work of art. The aim of the paper is to determine the current concepts of virtual art based on the analysis of iconic art projects that represent different methods of working with virtual reality technology. The paper examines the phenomenon of virtual art from several viewpoints: the revival of the artist's work methods, the peculiarities of the perception of the work of art in the virtual space, and the formats and issues of archiving virtual art projects.

Keywords: virtual art, technology, digital art, multimedia, new media, immersiveness.

Introduction. Virtual reality technology has become increasingly popular in recent years. Formed in the 1980s and 1990s, virtual reality was actively used in the entertainment industry, in particular in computer games, as well as in the various types of educational simulators. In the initial stages, the inclusion of virtual reality in the artistic sphere was associated with the placement of digitized works of art in virtual space. The revitalization of this process was facilitated by the events of the most recent years of the pandemic with the need for social isolation. Hence, since 2020, we have been observing an active transition of art projects into a virtual space. It became possible to transfer the process of artistic creation to the virtual plane at the next stages of mastering the technology of virtual reality, thanks to the appearance of the relevant software and the development of appropriate technological accessories. Thus, the way the work of art is functioning has significantly changed in several areas in the way the work of art exists, in the way it is produced, and in the way it is perceived and interacted with the audience in virtual reality.

The aim of the article was to study these changes as well as to define the current key concepts implemented in virtual art projects. Accordingly, the methodological basis of the research is based on analytical, historical-typological and systematic methods that made it possible to systematize individual elements of the considered projects in order to generalize the key features of the phenomenon of virtual art and to understand its further directions of development.

Literature review. Theoreticians who studied virtual art agree on considering it to be the result of combining art and technology and they recognize the prospects for its further development. The term "virtual art" was introduced by the art and technology historian Frank Popper in his work From Technological to Virtual Art. He considers modern virtual art as an improved version of technological art with an enhanced interactive component (Popper, 2007). According to Popper, this transition from technological to virtual art may be explained "Not only with radical technological changes, such as the latest computer developments and the wider use of the Internet and mobile phones,

• 50 •

but also with an aesthetic change that concerned artistic interaction in a wider and on a more personal scale" (Nechvatal, 2003). Iryna Zubavina considers the "screen", "screen reality," and the related "virtual reality" to be central culture-forming phenomena (Zubavina, 2021, p. 59). The researcher defines virtual reality as "a zone of compensation of user's complexes, fears, phobias, promising raising self-esteem, and on the other hand—a rather dangerous dimension, because it causes transformations of meanings, distorts social reality, puts the user into state of altered consciousness" (Zubavina, 2021, p. 63).

Unlike F. Popper, V. Bychkov and N. Mankovska do not consider interactivity to be a mandatory component of virtual art. Researchers define two models of virtual art according to the role the audience plays in it reception: "dynamic aesthetic spaces, meant only for exhibiting [the works of virtual art] as virtual objects of aesthetics, for visiting and perceiving them" and "interactive aesthetics spaces, designed for active interaction with the audience and its creative participation" (Mankovskaya & Bychkov, 2011). Z. Skolota also defines the virtual cultural space based on the character of the audience's perception of the artistic image. Skolota describes two environments where the digital art operates: media environment and cyber environment (Skolota, 2014). At the same time, within the framework of the media space, the recipients, in the opinion of the researcher, are passive observers, and in cyberspace they are endowed with the functions of the creators.

Results and Discussion. We consider the above-defined models of virtual art, namely, presentational and interactive, to be the basis for the study of virtual art from the point of view of the mechanisms of its perception. Thus, the presentation model of virtual art is widely displayed by museum and art gallery virtual tours, which have become especially popular and relevant during the COVID-19 pandemic. Examples include the virtual tour of the MACBA Museum of Contemporary Art¹ in Barcelona (Spain) which is a permanent virtual exhibition of the museum's collection, regularly updated with new works added to the main exposition. The same strategy is implemented by the British National Gallery² (London, Great Britain), Musée du Louvre³ (Paris, France), Istanbul Modern — Museum of Modern and Contemporary Art⁴, (Istanbul, Turkey), and others. In addition, there are projects that exist in the virtual form only. For instance, Art Basel was one of the first to introduce the exclusively digital format of the exhibition, implementing the project on the virtual platform Online Viewing Rooms⁵. Another example is WHAT'S UP / TWENTY TWENTY⁶ by LVH Art, exhibited in a virtual space, described by the organizers as a competitor to the real-life exhibition spaces that overcomes spatial and temporal limitations. Within the framework of the presentational model, the practice of combined presentation of art projects is widespread when the exhibition in a traditional exhibition space is followed by its virtual version, for example, the digital space launched by the M17 Center for Contemporary Art. The first project presented in virtual space was Victor Sydorenko's exhibition "Year Zero. The idea of light"⁷.

It should be emphasized that the presentational model of virtual art provides the audience with a chance to move around to get authentic and natural impressions similar to visiting a gallery space but, still, despite such freedom, the viewers' perception of works of art does not go beyond traditional passive perception.

Multiple variants of artistic ideas, involvement of the audience into the unfolding of the work, and multiple variants of its possible scenarios are mandatory components of the interactive model of virtual space. F. Popper emphasizes the openness of virtual art, which "... presupposes a certain freedom of action and creativity, but not at all for the radical destruction of what existed before" (Nechvatal & Popper, 2004). Thus, examples of the interactive model of virtual art are multi-sensory projects, which include several options for the development of events depending on the choice of the recipient.

The practical aspects of the work of artists with virtual reality, the features of methods and tools for creating virtual art are tracked based on the analysis of art projects implemented with the involvement of virtual reality technology, as well as through the interviews with artists that depict their position in relation to the issues raised in the paper.

Myron Krueger was one of the first to develop the concept of virtual art and introduced the term "artificial reality" in 1973. His exhibition VIDEOPLACE (1975) became the first interactive environment that responded to the movements and actions of users and enabled interaction between several participants of the project.

CAVE technology that, similar to virtual reality, achieves the effect of immersion (immersiveness), is considered to be the forerunner of virtual reality. Cave Automatic Virtual Environment is a space in the form of a cube, on all surfaces of which an image is projected. Moving within the designated space, the audience is completely immersed into the imagery space created by the artist. The difference between the CAVE and the virtual space lies in the fact that the former is a physical space and the latter is completely computer generated. O. Chepelyk's definition of immersiveness is relevant for both considered versions of its realization and interprets it as "properties of the environment that are brought to existence using the latest technologies and have the potential to transform the psychological state of a person in such a way that interaction with the environment guarantees a flow of stimulus-reactions and the 'Self' of a person perceives itself as engaged in this experience" (Chepelyk, 2021, p. 25).

At the current stage of technological development, virtual reality contributes to the significant expansion of the tools of artists, allowing them to achieve a new level of interaction

¹ https://www.macba.cat/en/art-artists/ongoing-display

² https://www.nationalgallery.org.uk/visiting/virtual-tours/ sainsbury-wing-vr-tour

³ https://www.louvre.fr/en/online-tours#virtual-tours

⁴ https://www.istanbulmodern.org/virtualtour/

⁵ https://www.artbasel.com/ovr

⁶ https://whatsuptwentytwenty.com/home

⁷ https://m17.kiev.ua/calendar/tsyfrovyj-prostir-tssm-m17/

with the audience. Thus, examining virtual art from the point of view of modern tools of its creation, we can state different approaches to the process. The influence of traditional methods on the creative process in the virtual domain may be observed in the work of the artist Alison Goodyear. She combines the traditional method of work, imitating the texture of oil paint in the painting Topsy, and a modern digital palette when working on Turvy. The artist formed her unique method (using technological tools, in particular Tilt Brush in the VR space), which she defines as "The expanded field of painting" (Ornes, 2022, p. 1) in the project "Paint Park" (2020, MK Gallery in Milton Reynes, UK). A similar method of work with a VR headset and a rotating chair made it possible to immerse the audience inside of the paintings. ""In one half of the work (*Topsy*) viewers were plunged into the messy swooshes and swirls in which oil paint presents itself in the physical world. Swaths of paint became swooping, overlapping pathways. The other half (Turvy) plunged viewers into a painting based on digital tools that looked unlike paint, including pulsing neon lights and oscillating graphics" (Ornes, 2022, p. 1).

Transformation of historical/academic art in a virtual space format may be illustrated with the art of Estella Tse. Using Tilt Brush, she creates virtual 3D model images of them. The author describes the method as "... taking apart, dissecting, and reconstructing the thinking and processes" (Tse, n. d.). Among the realized projects of the artist there are the famous canvases The Kiss by Gustav Klimt, *The Scream* by Edvard Munch, *The Two Fridas* by Frida Calo, which are combined in a project of two series: *#MASTERCOPYMNDAY* and *Art Attack!* By combining the technologies of virtual and augmented reality, the artist attempts to preserve the original style and technique of recognized artists and represent them to the audience from a new perspective.

As the artists mentioned above, Stuart Campbell also creates art objects in the virtual space. Under the pseudonym Sutu, the artist combines VR and AR technologies in his works. "Since the release of VR art programs such as Tilt Brush, Gravity Sketch, Quill and Anime VR, I've been enjoying exploring the possibilities of immersive spatial art making. In my opinion, this new practice represents the biggest revolution in digital art making. It still blows my mind that I can stand inside my own art and that I can manipulate it, scale it and add to it in real time" (*VR art: VR*, 2019). Thus, in our opinion, the possibility of the artist creating in a virtual 3-D space, as well as observing one's own work from different angles, definitely affects the development of specific skills and, therefore, the development of new techniques and methods of artistic work.

Ukrainian artist Stepan Ryabchenko implements a radically different strategy of work with virtual reality technology, namely its materialization. Using digital tools, he creates an alternative virtual reality with utopian images and landscapes. "Often, fictional plants and animals are the subject of the image—a surrealistic form of life that exists according to its own laws in the world created for them" (*Virtualni landshafty*, 2020). His paintings are like the frozen still-frames from virtual spaces. "Using one of the components of the technogenic development of humanity as a tool, the artist appeals to the topic of human relations with the virtual and natural environment, the development of fundamental values and the understanding of one's own essence" (Matsenko, 2017). In addition, in response to the global pandemic of COVID-19, the artist launched an international virtual exhibition in the virtual space "Strange Time"¹, which united artists from all over the world in the quest for responses to the current challenges.

A more profound interactive component may be seen in the multi-sensory virtual project *Basement Drawing* by the German artist Albert Oehlen that was realized under the curatorship of Hans Ulrich Obrist, in collaboration with John MacInnes and MacInnes Studios specialists. According to the concept the audience in the artist's basement studio observes the artist's "hyper-realistic avatar" (Jebb, 2022), who sits at his desk and paints. The sound accompaniment coincides with the movements of the artist, who nods his head in the process of painting. This virtual experience of contemplating the artist's work process lasts three minutes, during which from the other side of the workshop space "a self-portrait animates to show the artist drinking 'cofftea', a tea-coffee hybrid beverage devised in collaboration with Oehlen 'that will never let you sleep again'" (Jebb, 2022).

Another virtual multisensory project is an experimental concert by KH-Marie in collaboration with the Scandinavian production studio of virtual and augmented reality Khora². During the concert, the virtual environment engages several senses. The viewer "... is fully immersed not only visually and thanks to the additional surround sound, but thanks to the aroma that is spread during the VR show, which KH-Marie developed together with Klara Ravat from Smell Lab" specifically for the project (*Sensory Concert*, 2021). The project is socially oriented because it was created for people vulnerable to COVID-19, as well as the elderly, who do not have the opportunity to attend live concerts and performances.

The restrictions related to COVID-19 also gave momentum to the creation of the Danish Dance Theater's *Centaur, a 360 Experience* project, which, also in partnership with Khora, realized an adapted version of the choreographic performance for virtual reality. The technology allows the viewer to watch the performance while being in different places of the virtual space, even at the center of the stage.

Miranda—A Live Steampunk VR Opera by composer Kamala Sankaram is the first interactive opera in the virtual space that combines theater and virtual reality. The audience is able to move inside the virtual space and perform the role of judge and jury specially assigned to it. "This innovative avant-garde vision of theater comes from LUMA co-founder Joshua Bernard Ludzki, who became fascinated with the idea of creating a live theater experience that could be experienced remotely in VR after the live theater industry was hit incredibly hard by the coronavirus pandemic" (Carlton, 2020). The technology for creating live performances was implemented by the Enhance VR team in collaboration with LUMA, which developed software based on Unity and Proton. It is important

¹ http://strangetime.art/

² https://khora.com

that this software can be a basis for the implementation of future interactive virtual performances. Among the mentioned audiovisual/synthetic projects, the interactivity and active participation of the audience is implemented in the *Miranda* opera to the greatest extent.

The general director of the Volta XR company confirms the powerful potential for the further spread of multisensory projects when he talks about the change in the trajectory of music "from just musical virtuosity towards spectacle. ... In 20 to 30 years, the direction I think it goes in is that there will be a cross between a music show and an art installation. Something you have to physically enter and is wrapped around you. It's interactive, dynamic and constantly unique" (Walfisz, 2022). The given vision reflects a general movement not only towards the combination of different types of art, but also towards further irreversible penetration of technological artistic content into people's lives.

Issues related to the physical existence of virtual art projects and their storage require special attention. From this point of view, the activities directed at the creation of a special database of virtual art looks relevant (Grau, O., 2003). "The Database of Virtual Art is both an evolving research instrument and a work in progress, changing according to the ongoing development of the field. Its documentation system will also serve as a predecessor for the systematic preservation of this art. Due to the fact that virtual art is totally dependent upon storage media, it is no exaggeration to say that an entire decade of art threatens to be lost for all time" (Noema, n. d.). In this aspect, resources such as ADA¹ (Archive of Digital Art // former database of virtual art) launched in 1999, are aimed at collective preservation of digital art. In addition, artists' websites that provide information about the art-projects perform the function of archives. Undoubtedly, the existence of such archives is an important level of the future research of technological art, as well as its further development.

Conclusions. Upon analyzing a number of instances of the involvement of virtual reality technology in art projects, the main concepts implemented in them were determined. The most widespread is the placement of digitized

¹ https://www.digitalartarchive.at/nc/home.html

References

The use of the Tilt Brush tool, intended for work in virtual space, allowed artists to experiment by comparing the traditional method of work (imitating the texture of oil paint) and digital tools (Alison Goodyear), to adapt iconic paintings by famous artists to virtual space, creating three-dimensional interpretations of them (Estella Tse), combine virtual and augmented reality (Sutu). In order to perceive the works of this type, the audience has to use special accessories, spectacles in particular, that enable viewing art-objects from different angles being inside the spaces where they are placed.

A more profound level of immersion is provided by multisensor projects, like *Basement Drawing* by Albert Oelhem, where the audience meets the artist face to face, watches him at his work; an experimental concert *KH-Marie*, which engages the sense of smell, along with the sight and hearing; *Live Steampunk VR Opera Miranda* that gives the audience a chance to play a role in the performance.

As a result of the dynamic development of the technologies, virtual art approached the new level of its evolution, changing its role from mere presentation of artistic works on visual or audiovisual level to the projects that engage different human senses, create an illusion of full immersion into the virtual space and, also, give the audience a dedicated role in the development of the work of art.

In our opinion, the presence of virtual and augmented reality will increase in everyday life of the society; this, in turn, will influence the transformation of the art processes. Moreover, the Metaverse by Meta may potentially become a platform that will offer fundamentally new level of communication in virtual reality. Without a doubt, it will influence artistic practices where the usual roles of the audience and the creator, and usual art forms, undergo significant changes.

Література

 Віртуальні ландшафти Степана Рябченка. New Now Gallery. URL: https://www.newnow.gallery/ukr/articles/view/44 (дата звернення: 01.07.2022).

2. Зубавіна І. Онтологія віртуального простору: Екранознавчі зшитки / Ін-т проблем сучас. мистец. НАМ України. Одеса: Гельветика, 2021. 376 с.

3. Маньковская Н. Б., Бычков В. В. Современное искусство как феномен техногенной цивилизации. Москва: ВГИК, 2011. 208 с.

4. Маценко Н. Выставка Show Promise: «Деревянная История» Степана Рябченко. Zenko Foundation. URL: http://zenkofoundation. com/news/vystavka-show-promise-derevyannaya-istoriya-stepanaryabchenko/ (дата обращения: 07.06.2022).

5. Сколота З. Цифровое искусство как проявление виртуализации культуры // European Social Science Journal. 2014. Т. 2. № 8. С. 384–389.

^{1.} Carlton, B. (2020, September 13). *Miranda: A Live Steampunk VR Opera Where You Play As Judge & Jury*. VRScout. https://vrscout.com/ news/miranda-live-steampunk-vr-opera/

^{2.} Chepelyk, O. (2021). Imersyvni seredovyshcha, VR, AR v ukraiyinskomu suchasnomu mystetstvi ostannikh rokiv [Immersive Environments, VR, AR in Ukrainian Contemporary Art of The Recent Years]. *Contemporary Art, 17,* 23–40. https://doi. org/10.31500/2309-8813.17.2021.248423

^{3.} Grau, O. (2003). The database of virtual art: For an expanded concept of documentation. https://www.archimuse.com/publishing/ ichim03/016C.pdf

^{4.} Jebb, L. (2022, June 14). New virtual reality work takes us through Albert Oehlen's 'throat, mind and hand' into a drawing. The Art Newspaper. https://www.theartnewspaper.com/2022/06/14/

new-virtual-reality-work-takes-us-through-albert-oehlens-throat-mindand-hand-into-a-drawing

5. Mankovskaya, N. & Bychkov, V. (2011). Sovremennoye iskusstvo kak fenomen tekhnogennoy tsivilizatsii [Contemporary art as a phenomenon of technology-driven civilization]. Moscow: VGIK.

6. Matsenko, N. (2017, July 1). *Vystavka Show Promise: "Dereviannaya istoriia" Stepana Ryabchenko* [Show Promise exhibition: "A wooden story" by Stepan Ryabchenko]. Zenko Foundation. http://zenkofoundation.com/news/vystavka-show-promise-derevyannaya-istoriya-stepana-ryabchenko/

7. Nechvatal, J. (2003). Origins of Virtualism: An Interview with Frank Popper. https://www.eyewithwings.net/nechvatal/popper/intervewww1.html

8. Nechvatal, J., & Popper, F. (2004). Origins of Virtualism: An Interview with Frank Popper. *Art Journal*, 63(1), 62–77. https://doi. org/10.2307/4134477

9. Noema (n. d.). *Database of Virtual Art – Now Public*. https://noe-malab.eu/senza-categoria/database-of-virtual-art-now-public/

10. Ornes, S. (2022). Virtual reality helps shape and respond to artistic impulses. *Proceedings of the National Academy of Sciences, 119*(31). https://doi.org/10.1073/pnas.2210323119

11. Popper, F. (2007). *From Technological to Virtual Art*. Cambridge, MA: MIT Press.

12. Sensory Concert | KH Marie (2021). Khora. https://khora.com/ project/sensory-concert-kh-marie/

13. Skolota, Z. (2014). Tsifrovoye iskusstvo kak proyavleniye virtualizatsii kultury [Digital art as a manifestation of the virtualization of culture]. *European Social Science Journal*, 2(8).

Tse, E. (n. d.). Frida Kahlo's "The Two Fridas" (VR adaptation).
Estella Tse. https://www.estellatse.com/the-two-fridas-by-frida-kahlo-vr
Virtualni landshafty Stepana Ryabchenka. (2020). [Virtual landscapes by Stepan Ryabchenko]. New Now Gallery. https://www.newnow.gallery/ukr/articles/view/44

16. *VR art: VR*. (2019). Sutu Eats Flies. https://www.sutueatsflies. com/art/vr-art

17. Walfisz, J. (2022, June 22). *Making VR worlds from the comfort of home*. Euronews. https://www.euronews.com/culture/2022/06/22/virtual-reality-art-could-we-be-making-it-in-our-homes-soon

18. Zubavina, I. (2021). *Ontolohiia virtualnoho prostoru: Ekranoznavchi zshytky* [Ontology of virtual space: Screen studies]. Odesa: Helvetyka.

6. Carlton B. Miranda: A Live Steampunk VR Opera Where You Play as Judge & Jury. VRScout. URL: https://vrscout.com/news/miranda-live-steampunk-vr-opera/ (access date: 17.07.2022).

7. Chepelyk O. Імерсивні середовища, VR, AR в українському сучасному мистецтві останніх років // Сучасне мистецтво. 2021. № 17. P. 23–40. https://doi.org/10.31500/2309-8813.17.2021.248423

8. Grau O. (2003). The database of virtual art: For an expanded concept of documentation. URL: https://www.archimuse.com/publishing/ichim03/016C.pdf (access date: 03.06.2022)

9. Jebb L. New virtual reality work takes us through Albert Oehlen's 'throat, mind and hand' into a drawing. The Art Newspaper. URL: https://www.theartnewspaper.com/2022/06/14/new-virtual-reality-work-takes-us-through-albert-oehlens-throat-mind-and-hand-into-a-drawing (access date: 27.04.2022).

10. Nechvatal J. Origins of Virtualism: An Interview with Frank Popper. URL: https://www.eyewithwings.net/nechvatal/popper/intervewww1.html (access date: 10.05.2022).

11. Nechvatal J., Popper F. Origins of Virtualism: An Interview with Frank Popper // Art Journal. 2004. No. 63(1). P. 62–77. https://doi. org/10.2307/4134477

12. Database of Virtual Art – Now Public. Noema. URL: https:// noemalab.eu/senza-categoria/database-of-virtual-art-nowpublic/ (access date: 16.07.2022).

13. Ornes S. Virtual reality helps shape and respond to artistic impulses // Proceedings of the National Academy of Sciences. 2022. Vol. 119, No. 31. URL: https://doi.org/10.1073/pnas.2210323119 (access date: 06.07.2022).

14. Popper F. From technological to virtual art. Cambridge, MA: MIT Press, 2007. 459 c.

15. Sensory Concert | KH Marie. Khora. URL: https://khora.com/ project/sensory-concert-kh-marie/ (access date: 12.05.2022).

16. Tse E. Frida Kahlo's "The Two Fridas" (VR adaptation). URL: https://www.estellatse.com/the-two-fridas-by-frida-kahlo-vr (access date: 06.07.2022).

17. VR art: VR. Sutu Eats Flies. URL: https://www.sutueatsflies.com/art/vr-art (access date: 13.07.2022).

18. Walfisz, J. Making VR worlds from the comfort of home. Euronews. URL: https://www.euronews.com/culture/2022/06/22/virtual-reality-art-could-we-be-making-it-in-our-homes-soon (access date: 06.05.2022).

Чібалашвілі А., Тимофієнко Б.

Актуальні концепти віртуального мистецтва

Анотація. Досліджено явище віртуального мистецтва як результат активної взаємодії цифрових технологій та мистецтва, що розпочалась з середини XX століття. Унаслідок цієї взаємодії відбулись значні зміни як у механізмах творчості, так і в процесі формування нових напрямів та жанрів мистецтва. Крім цього, змін зазнав й характер сприйняття аудиторією віртуального мистецького твору. Останнє пов'язано з інтерактивністю як невід'ємною складовою віртуального мистецтва. При цьому ступінь інтерактивності може бути різною — від традиційного споглядання, наприклад, у форматі віртуальних музейних турів, до активної участі глядача в процесі творення. Метою статті є визначення актуальних концептів віртуального мистецтва за результатамианалізу знакових мистецьких проєктів, які репрезентують різні методи роботи з технологією віртуальної реальності. Для досягнення зазначеної мети у статті розглянуто явище віртуального мистецтва з кількох позицій: оновлення методів роботи митця, особливостей сприйняття твору у віртуальному просторі, а також форматів існування та питань архівування віртуальних мистецьких проєктів.

Ключові слова: віртуальне мистецтво, технології, цифрове мистецтво, мультимедія, нові медія, імерсивність.