

ImGame: An Immersive Educational Environment to Teach Contemporary Art

Ieva Gintere¹^a, Emmanouel Rovithis²^b, Ágnes Karolina Bakk³^c and Alvis Misjuns¹^d

¹*Vidzeme University of Applied Sciences, Tērbatas street 10, Valmiera, Latvia*

²*Ionian University, Plateia Tsirigoti 7, Corfu, Athens, Greece*

³*Moholy-Nagy University of Art and Design, Hungary, Zugligeti út 9, Budapest, Hungary*

ieva.gintere@va.lv, emrovithis@ionio.gr, bakk@mome.hu, alvis.misjuns@va.lv

Keywords: Immersiveness, New Media Art, Serious Games, Ecosystems, Meditation.


Abstract: The study describes a creative virtual environment named ImGame which serves as an interactive platform hosting recent works by new media artists in Latvia, Greece, and Hungary. The study explores the common conceptual characteristics of these works as interpreted by the ImGame researchers. The artworks have been categorized under two intertwined aspects, namely meditation and ecosystems. The terms are slightly different in each country: the Latvian artworks demonstrate a meditative state of mind linked to reflection about ecology that also encompasses purity of mind. The Greek works highlight the organicity and interconnectedness of elements that form alternate ecosystems which can be seen as ways to escape previous thought patterns. For unpredictable realities to be plausible there is a need for a contemplative mind set before the change of perspective. The human role is reimagined as a set of data-driven variables participating in the dialogue between old and new, physical and digital, natural and artificial. In Hungary, artworks often deal with data gathering techniques and their visualization. They are simulated ecosystems, where the viewer is part of that system and can contemplate and submerge in it with the aim of raising the participant's level of sensitization towards social issues or phenomena.


1 INTRODUCTION


The serious art game entitled ImGame is being designed cooperatively by three research institutions in the framework of a Creative Europe grant from the European Commission (2022-2025) to demonstrate the contemporary artistic phenomena related to the psychological experience of immersiveness which is close to the feeling a reader has when wrapped up in a good novel. The game aims to teach about trends in new media art, strengthen an investigative, observational relationship with our current cultural environment and create a dialogue about ideas generated by these artworks during recent years. As various researchers have noted, effective learning occurs when a relationship between user, cultural context, and the immersive reality system is established (Bekkele and Champion, 2019). ImGame


offers an artistic interaction with the environment, a possibility to encounter recent works and learn about their cultural context through specially designed activities.

The project's design proposes an indirect mode of learning created by the user playing in the virtual environment, exploring, memorizing, and remembering specific aspects of the experience. An interactive relationship is established between user and content, as the former freely moves in the virtual space, which is organized in compartments, like separate game-stages, featuring different thematics and posing different challenges. The first stage is dedicated to the antecedents of modern aesthetics. There, users are expected to be able to comprehend and briefly describe the conceptual aspects pertaining to the feeling of immersion. Before entering the next stage, they will be asked to name the targeted

^a <https://orcid.org/0000-0003-0203-3351>

^b <https://orcid.org/0000-0001-7404-4063>

^c <https://orcid.org/0000-0003-4036-256X>

^d <https://orcid.org/0009-0003-4841-9302>

associations as well as historical ideas related to immersiveness, such as the keywords “awe”, “captivation” or “flow”. The next stage is where the digital artifacts are exhibited. Users are encouraged to examine them, as well as the surrounding space, in search of tokens that will be redeemed for creative modules in the final stage, a virtual studio designed for experimentation. By means of all the above, the game creators intend to improve learning by contextualizing immersive experiences “within a lesson” (Makransky and Mayer, 2022). The educational results will be evaluated via interviews of users during the last year of the project.

The authors of ImGame utilize experience-based knowledge or the ‘learning by doing’ approach where the user learns by constructing knowledge while doing a meaningful activity (Mortara et al., 2014) so that a player is considered “as an active transformer and not as a passive contemplator” (Marxen, 2009). For best results, exploration as well as a social context in terms of interaction between learners is encouraged. Hence, the ImGame project will eventually guide users to take part in the playful environment and create some artifacts using virtual creative tools unlocked by quizzes and challenges that help one denote the basic features of immersiveness. The explorative nature of the game is expected to motivate users to spend time examining the virtual exhibition space. Since all the researchers working in the team are university teachers, the game will be used in a classroom to ensure discussions and the exchange of experience after the course.

The niche of serious art games dedicated to the art styles of the 21st century has been left with almost no attention. On a global scale, only a few games teach contemporary art (Gintere, 2020); however, these games do not represent the examples of immersive aesthetics as such. The digital role-playing game Kronos that educates on concepts of electronic music is one of the few that are connected to contemporary art (Rovithis et al., 2014). ImGame intends to fill this gap and support the knowledge acquisition of art during the last decades.

2 THE CONCEPT OF IMMERSIVENESS AND ITS IDEOLOGICAL PROFILE IN CONTEMPORARY ARTWORKS

At this stage of the project only a theoretical model of

ImGame has been created which will be empirically tested. The project’s “knowledge discovery” (Janševskis, Osis, 2023) will be built on a qualitative research basis, using deep semi-structured interviews of users to assess the educational results and develop the game following the obtained data during the testing and interviews. Qualitative data are planned to be collected at Ionian University (Greece), Latvian Academy of Music and other institutions of education.

This paper describes the main concept and ideological framework of ImGame, which has served as the basis for its design. The game is focused on the psychological feeling of immersiveness that has been defined by the authors as a twofold phenomenon encompassing:

- a meditative yet rational reflection,
- ‘disappearing’ into the aesthetic object (affective, timeless contemplation of an artwork).

These aspects cannot be separated as in most cases they come as an ensemble or a shifting between the two. Musicologist Veit Erlmann (2010) has precisely described this mental state where the subject’s mind balances between distanced, deliberate watching or listening and momentary self-forgetfulness. This particular twofold characteristic of immersiveness also appears in works by the theoreticians Harri Mäcklin (2021) and Mihaly Robert Csikszentmihályi (1996). They note that even when the subject is ‘floating’ in the aesthetic experience and identifies oneself with the artistic material such as music, literary work or film, the subject can still be reflecting on this experience. Hence, immersiveness can be called an altered mode of the subject’s mental involvement that marries a rational self-awareness with a dream-like condition.

The experience of immersiveness will be represented in the game by artworks created by the young artists (described below). The theoretical context will be demonstrated with the help of Greek myths about Narcissus and Medusa, as well as the Kantian concept of sublime in order to briefly explain the feeling of awe, captivation, flow and other keywords related to contemporary aesthetics of immersiveness.

2.1 Technical Aspects of ImGame

The idea of ImGame is based on a post-doctoral project at the Vidzeme University of Applied Sciences in Latvia. The demo version of the game entitled Art Space (Gintere et al., 2021) was created in the frames of the post-doctoral project led by

researcher Ieva Gintere. It is a demo version of an educational virtual space with gaming elements that transfers knowledge about contemporary aesthetics to a wider public and teaches the audience about modern digital audio-visual stylistics. Technically, Art Space was made using the Unity game engine which requires a gaming PC to run. ImGame is stylistically and educationally a continuation from Art Space.

ImGame is a web-based game currently under development using the A-Frame framework which simplifies the game development as it uses the ECS (entity-component-system) architecture. A notable feature of A-Frame is its implementation of the WebXR API (Application Programming Interface), enabling virtual reality experiences to run through supported web browsers. ImGame can run not only on smartphones, tablets, computers, and similar devices but also with head-mounted displays (HMDs) (Rodríguez et al., 2021).

Interaction in ImGame is achieved through point-and-click or touch, depending on the device. It is facilitated by a custom component called trigger.js, designed specifically to activate animations on 3D objects and manage loading and unloading content. As A-Frame is taught in the Art Academy of Latvia across multiple study programs, ImGame components have been developed with user-friendly usability in mind.

ImGame comprises three stages (figure 1) arranged linearly, facilitating quick navigation from one end to another when all stages are unlocked. The first stage, Antecedents visualizes concepts in an abstract manner (figure 2), and when interacted with, grants information and points. The second stage, Exhibition presents the greatest technical challenges due to the nature of digital artworks. While some artworks like images and videos can be directly integrated into ImGame, others require custom components for point-cloud visualization, portals, 360 recordings, and more. In the Exhibition, tokens and points can be collected, which are then utilized in the final stage, the Studio (figure 3). Here, tokens and points unlock creative tools for users to craft expressive compositions.



Figure 1: ImGame three stages.

To preserve user compositions and progress, a component named db.js has been developed, managing user logins and saved game states. Additionally, this component can be employed to

gather data, draw conclusions, and make adjustments to game design as needed.

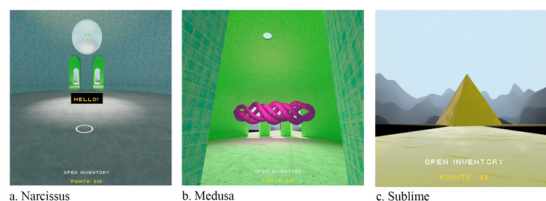


Figure 2: Antecedents.

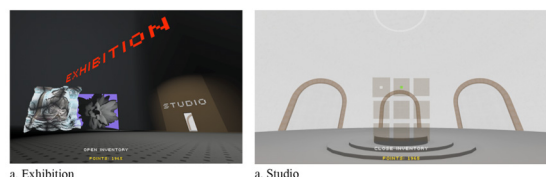


Figure 3: Exhibition and Studio.

2.2 Characteristic of Immersiveness in Latvian Recent Artworks: Calmness and Pureness

There is a visible tendency among the Latvian new media artists to demonstrate a calm, meditative state of mind. It is often linked to reflection about ecology that encompasses an eco-psychology, as it might be called, or pureness of mind. The mood of deep thought in these works mirrors the ecological approach; the mind as an ecosystem needs to be taken care of to avoid negative influences or an overload of information. A promenade in these virtual landscapes can be sometimes treated as an allusion to wandering in one's soul or subconsciousness to maintain its spiritual qualities. The works are conceptually close to Cory Arcangel's popular video installation "Super Mario Clouds" (2002) which is a modification of the game "Super Mario Brothers" (1985). Arcangel has hacked the original game and erased all the sound and visual elements such as Super Mario's jumping and running through a labyrinth, leaving just the pixelated white clouds that slowly move over the blue sky (Iantorno, 2023). Thus, the author has turned the game into an abstraction with lots of space for a deep reflection, using the symbols of sky and clouds as icons of thoughtfulness and purity. Latvian new media artworks of the 21st century are not so radical, yet they demonstrate, as Arcangel does, an inclination to get rid of the unnecessary activity, creating a mood of reverie and a reference to nature.

2.2.1 “Peace on Web” and “Atmospheric Forest”

The WebXR experience “Peace on Web” by Alvis Misjuns (2022) is a virtual place for the user wishing to be alone and skip influencers, ads, purchases and competitive activities characteristic of the modern web. The environment is created as a sandy terrain landscape with a calm sun, distant water and meditative sound. A holy water container has been added to the work in the exhibition hall to represent the spiritual idea of the work in the analogue space. In order not to disturb the peace and the serene passing of time, each user is provided with an avatar that harmoniously fits into the environment, for example, a branch or a rock. Verbal and text communication is unavailable. Thus, the work’s atmosphere is meditative, and its message is eco-psychological at the same time: it proposes an alternative, purified environment that helps keep stress away from our digital activities and maintain mental well-being.

“Peace on Web” was created in reaction to the attempts by such companies as “Meta”, “Microsoft”, “Nvidia”, and “Google” to create a metaverse – a wide-reaching 3D virtual world that combines various communication platforms, industries and payment systems. Some features of the metaverse are used on popular platforms, such as “Roblox”, “Minecraft”, and “Fortnite” where the players are made to compete with each other in order to survive.

Although the “Atmospheric Forest” (2020) by Rasa Šmite and Raitis Šmits is focused on a forest as an ecosystem, it is a meditative environment at the same time as it evokes slow reflection and a contemplative mood in the user. It provides an immersive experience by visualizing the complex relations between forest and climate change. Trees emit large amounts of volatile organic compounds that we can sense as the scent of the pine forest, yet some scientists believe that these emissions could make global warming worse. “Atmospheric Forest” creates visual data of volatile emissions and resin pressure in pine trees. The viewer can navigate through the emitting trees of virtual forest, observe it from the bottom up, and follow the path through the tree trunk to get far up above the emitting forest, experiencing the interactions between the terrestrial ecosystems and the Earth’s atmosphere.

2.2.2 Other Examples of Meditation and Ecology of Mind

“Imagination” by Paula Ostupe-Dejus (2022) contains over 300 unique illustrations of nature and

imagination created by the artist: aliens, plants, animals, characters, and mushrooms. She uses cascades of images, creating depth in the 3D space to achieve the feeling that the scene is revealed through exploring. The work offers a promenade in wonderful scenery that can help unburden one’s mind. “Imagination” can be interpreted as an attempt to escape from reality to a certain degree as it demonstrates an idealistic, uncontaminated world. Another ecosystemic immersive work by Ostupe-Dejus is *Solution* (2018) that reflects the problem of air pollution. It is a VR projection of a futuristic, hermetically sealed space where oxygen is being produced artificially to solve the problem of air pollution. This environment, much like “Imagination”, is a subtle invitation to take a deep breath and feel isolated for a moment from the harsh reality outside.

“Transfungus” by Gints Gabrāns offers a meditative experience of mushrooms. Visitors to the exhibition can learn about the nature of mushrooms with the help of AI generated images and responses from their own body. As the artist points out, “self-exploration of a mushroom/human is infinite” because the versions of AI human-mushroom images are not limited. Mushrooms are the embodiment of divine thoughts, he affirms, as they reveal a variety of beauty and peace. “What cannot be talked about can only be enjoyed,” says Gabrāns. “The project reveals the mushrooms’ adventures with the human exobody” (Arterritory, 2023) as well as demonstrating the integration of humans into the ecosystem of forests and the wonders of nature.

In Zane Zelmene’s “Guide to Invisible Landscapes” (2022), one walks in a space of magic orbs using the HM headset and enters different dream worlds (they are made on the basis of the artist’s own lucid dreams). The orbs are parallel realities, each with its own, calm character. The artist invites the user to dive into meditative spaces and explore the sophisticated visions of these virtual areas. The user is invited to meditate on the view, yet the work belongs to the category of ecosystems as well because it tends to initiate psychological refinements through a peaceful wandering in the microcosmos created by the artist.

Rute Marta Jansone (2020) has created a contemplative VR environment “Insight” that recalls the famous board game “Circus”. Here, by using the touchpad, the user is invited to illuminate the images and reveal what is hidden under their surface. The particular field that is illuminated transforms and demonstrates the inner nature of situations as well as triggers the associative mind of the viewer. The user

sees the characters in different dispositions as if explaining their secret meaning. The narrative is formed following the user's subjective interpretation and individual impressions. "Insight" falls under the category of mental ecosystem in a broad meaning as it intends to manifest our personal understanding of situations, to show things as we see them unrelated to social standards, and moral norms. The work is contemplative and thoughtful, too, as the user is offered the opportunity to dive into one's own reflection to seek explanations of the situations.

2.3 Characteristic of Immersiveness in Hungary

Many Hungarian immersive artworks aim to provide a sense of a system that can immerse viewers in two ways. These artworks either challenge the viewers with an immersive meta-level type of reflection on how data abundance can mesmerize us, or by addressing our sense of empathy by putting the viewer into the middle of the ecosystem that can sensitize them regarding social issues or phenomena. The artworks use various types of techniques, but many of them rely on generative AI algorithms.

2.3.1 Awe by Data Structures

The data visualizations "150 Years of Nature" crafted by the Barabási Lab, were featured on the cover of the National Geographic (Barabási, 2019) and presented at the "Hidden Patterns" exhibition at ZKM Gallery in 2021 to provide a distinctive opportunity for recipients to reflect on the intricacies of data and its societal connections. Viewing data visualization becomes a contemplative practice, requiring time and effort to unravel and comprehend extensive information. This process enables individuals to engage in introspection. Moreover, the visualizations create a unique convergence of science communication and its artistic implications. This interdisciplinary perspective can create a certain awe that enables the viewer to have the sense of meditation.

Máté Előd Jánky's works are intricately tied to virtual experiences, predominantly utilizing digital media and internet footage to convey ambiguous emotions within bustling yet delicate realms, spanning both auditory and visual domains. His creations resemble pages extracted from a coded diary, visually delving into the development of personal symbolism and mythology while exploring diverse psychological concepts. His images serve as mind maps or visual depictions of thought patterns,

saturated with self-reflection through shapes, textures, and narratives. In the realm of sound, he explores improvisation, textural thinking, eclecticism, and the frontiers of music. His work "The Dream of Love" (Előd Jánky, 2020) epitomizes the meditative states that virtual communities can provide to users. The meditative, sometimes self-destructive messages offer viewers a moment for contemplation on how continuous online aesthetics influence our perception of reality.

Kati Katona's work offers a reinterpretation of nature's rule-based systems and prompts viewers to contemplate the concept of predestination. The interactive video installation "Submerge" (Katona, 2022) utilizes motion graphics to immerse users in a state of fusion with the environment. Her artistic focus centers on generative, procedural, and 3D animation. Inspired by nature's elements, biomorphic structures, and natural algorithms, this project aims to deliver the viewer into nature artificially drawing attention to the granularity of it.

2.3.2 Ecosystem as a Tool for Social Imagineering

Judit Navratil's "Szívküldi Lakótelep" (2021-) incorporates the experience of her temporary relocation to a small Canadian island, where she resided in a friend's enchanting boathouse. Life on Salt Spring Island presented a unique experience, surrounded by the silence and rhythm of nature in a challenging landscape for her video "Long Distance Somersaults". Inspired by this, she chose to chart the various sections of the VR Neighborhood by somersaulting through its virtual realms. To unify the different facets of Szívküldi Lakótelep, Navratil intertwined the practice of "Long-Distance Somersaults" into these realms, forming the foundational structure of the project.

Her work is categorized as an ecosystem, representing a cyberspace where individuals are invited to engage. These gatherings serve as consciousness-shaping events, encouraging participants to confront anxieties and reconsider their physical and psychological conditions – a manifestation of a pure and eco-centric approach on a broader scale (Navratil, 2018).

KirstófLab's (Kristóf Szabó) "Wrong Data Landscape" (Szabó, 2023) explores the dynamic between nature and a constructed environment, juxtaposing the static nature of human-inhabited structures with the organic movements of the natural world. This contrast is visually evident in the video, where the gradual, rhythmic undulations of the

earth's grains harmonize with the frozen stillness of the buildings. The visual error within the image serves as a symbolic reference to human presence, suggesting that this error is a consequence of human intervention.

The installation "Limbo" by Gábor Kitzinger and his team (Kitzinger et al., 2020) unveils the perpetually repeating life cycle of a digitally generated entity. The simulation, captured by four cameras within the program's virtual space, is then displayed within a precise plexiglas pyramid or frustum. The holographic animation depicts a bust, allowing us to witness the entity's accelerated life cycle from the zygote state to death and onward to Limbo, where the entire cycle recommences, trapping the entity in an unending repetitive loop. The audio material controls the character, yet the viewers can also interact with it through simple gestures that modify accompanying soundwaves. These gestures serve as stimuli, disrupting and altering the entity's repetitive reality, introducing uncertain events into its cyclical existence.

The artwork presents an abstract and ambiguous representation of life as an ecosystem. Life, with all its living components, forms a living ecosystem with a rhythm dictated by biological elements. The ecosystem is biologically conditioned, but it also demonstrates how our actions have consequences on our life. In Limbo, the user is shown how the consequences of individual acts can manifest in changes of the desired rhythm. The work offers a possibility to change, this way manipulating the lifecycle of an individual. It demonstrates our ability to affect the biological lifecycle, illustrating how human gestures and our assumed agency can become integrated into the system.

2.4 Characteristic of Immersiveness in Greece: Escapism and Organicity

Escapism seems to be the underlying fabric in the works of the Greek artists that were examined by the researchers. Possibly rooted in the economic crisis experienced in the last decade and still lurking today, there is a visible tendency to distort reality, not in the sense of "disrupting the message" through techniques of deformation or under-representation, but rather by changing its generic parameters to present an alternate version, a different but still plausible universe. Economic recession coupled with political turbulence and social insecurity, has produced a sense that the cards can easily be reshuffled, and the dice re-rolled instantly by fate into a dystopian future. The artworks reflecting these considerations do not

embrace panic, nor do they wish to warn by being repulsive; instead, they invite the audience into convincing possibilities, as manifested by the interdependencies that govern their elements.

Fictional worlds are held together by their organic environments, yet the tweaking of selected details can lead to major deviations, where anything is possible. In the Greek artists' attempts to virtually construct such immersive "living and breathing" systems, two perspectives are salient: the one aims to challenge the perception of reality and leave the spectator in awe before the implications of an unknown fictional world, whereas the other focuses on organic autonomy per se aiming to turn the audience towards themselves in an inward contemplation of the individual's complexity, and one's fluid and fragile place in the cosmos.

2.4.1 Parallel Ecosystems

Anestis Anestis' "Love Distortion Field" (Anestis, 2021) features a snapshot of a humid urban environment, an empty dark alley illuminated by a neon sign. In the middle of the picture lies a black hole, dark and mysterious, with its corona blending into the neon light in hues of red. Yet, the distortion seems to fit in the picture like a normal, everyday occurrence. In fact, this and all other instances of the artist's collection "Night Encounters" follow the same pattern: urban landscapes with "naturally" embedded cosmic phenomena blending into a new, coherent reality.

In her VR exhibition "Uh everything looks so fresh – Oh everything is so rotten!" (2020) Eva Papamargariti invites the audience to roam around a series of CGI (Computer Generated Image) rooms populated by hybrid, ominous creatures, comprising an audio-visual world beyond the boundaries of space and time. In these extraordinary landscapes with inhabitants behaving absurdly, natural shapes are highlighted with intense colors and shining textures, and gestures that obey natural physics yet become entangled in repetitive loops. As the artist herself has stated, biological systems set the example for other systems' functions. In her work, the micro and macro characteristics of ecosystems act as guides for cycles of generation and development (Papamargariti, 2020).

In his video work "Ichographs II – Absentia" (2021) Yannis Kranidiotis disrupts classical paintings through modern, digital ways of abstraction by letting human figures decompose themselves into a fluid stream of pixels until they reach the state of nonexistence. Detached from their core elements, the

depicted ecosystems are now seen through a different, holistic prism, where the notion of emptiness gains its own substance. In the fused reality of stability and flux, a dialog between the old and the new, the viewer is guided to contemplate the process of change (Kranidiotis, 2021).

Thomas Valianatos uses AI generated imagery to reinvent the city of Athens in the work “Athens, the present that did not exist” (2023). In a fictional timeframe that is neither present nor future, people in public spaces are represented as entities in a constant change of state between human and robotic elements, whereas buildings and streets claim their space on the verge between familiarity and unrecognizability as a way to escape from the present to a world of possibilities (Valianatos, 2023).

2.4.2 Meditative Organisms

In her interactive virtual installation “Where do I exist?” (2021) Sousana Romanidou explores the boundaries between virtual and physical ecosystems, and wonders about the role of human interaction in that bipole. Her work is a collection of virtual rooms that can only be changed via user input of a specific hashtag. A symbol of communication becomes the only variable able to transform an otherwise closed system. Besides intervening from the outside, users can also examine themselves in the virtual space through a camera, which invites them to reflect upon their place. The conceptual focus is shifted from the environmental rules governing the organisms of the ecosystem to the organisms themselves (Romanidou, 2021).

“Not Allowed for Algorithmic Audiences” (2021) is a video installation of seven monologues narrated in seven consecutive days by a virtual entity. The artist, Kyriaki Goni, investigates the relationship between humans and machines by letting a symbol for Artificial Intelligence borrow a human form and reveal information about their programming, infrastructure, and even share tips on how humans and machines can be reconciled. The work’s post-anthropocentric approach implies a paradigm shift in societal equilibrium, in which new balances must be sought through reflection and contemplation (Goni, 2021).

Pandelis Diamantides’ generative audiovisual artwork “Pulse” (2022) uses data from the artist’s own heartbeat and breath coupled with data from the crowd’s movement around a social point of interest to drive its software. The artist fuses three metaphorical axes, the emotional, the physical, and the social, into one organic entity, whose body is placed in the

middle of a dark vacuum, and whose function reflects the need for inward exploration (Diamantides, 2022).

3 CONCLUSIONS

A study of digital artworks from the beginning of the 21st century has been conducted in the three partner states of the ImGame project – Latvia, Hungary and Greece with the aim to include the works in a digital game about contemporary art, support their international circulation and disseminate knowledge about the most visible characteristics of art today.

A certain bipolarism can be observed in the structure of the overlooked artistic concepts; they often refer to a gap between the ecosystem (a pure, organic place in various interpretations) and the other which can be the polluted environment or a virtual platform which is considered a world of new possibilities. The notion of ecosystem is also frequently linked to a mediation state as the user is invited to contemplate the calm atmosphere of the ecosystem and its beauty, or adaption possibilities to the new technological reality. Thus, the trends of meditation and ecosystems are often related.

There is a visible tendency in Latvian new media art to reflect upon a clean, uncontaminated world. The concepts are sometimes utopian, escapist, and introverted. An ecosystem is a territory of peace and mental purity which helps to maintain a psychological balance between the stressful reality and sometimes idealistic or even hallucinatory scenes of art. The notion of ecosystem has been used in the classical sense i.e. related to nature preservation, but it is also a place for a search of freedom and true, individual consciousness.

In Hungary, the artists using new technologies including generative AI often aim to immerse the viewers by relying on a meditative state that these data visualization types of artworks can represent. Other works aim to approach the concept of ecosystem in unconventional ways, for instance, to create new fictional worlds. Digital technologies offer them an opportunity to represent their views on contemporary society on a micro- as well as on a macro level in an immersive manner.

The notion of ecosystem is vivid also in the works of Greek artists. The ecosystem behaves as a whole, its elements are interconnected, its parts united in an organic whole. Greek artists seek a refuge outside of time, yet the structured laws of the ecosystem are still needed to ensure stability. Physicality is sought in streams of data, familiarity in exotic imagery, and cause and effect in novel interaction. The Greek

artworks prompt the audience to immerse and search inward for a natural equilibrium in changing times.

The ideas of these artists have been collected and analyzed by the project authors to promote digital art created recently and demonstrate the common concepts in these works. They will be assembled in a digital environment entitled ImGame to demonstrate the psychological feeling of immersiveness in digital art in relation to the mood of meditation and ecosystemic awareness.

ImGame belongs to the narrow niche of serious art games as it offers educational content and a journey into new art. The project intends to expand the industry of gaming in general and improve competitiveness in the specific field of artistic gaming. The project aims as well to support the creative activities of artists in the 21st century and to improve access to their works, thus safeguarding them in the modern, rapidly changing world where the works are at risk of being lost without documentation in the huge number of fleeting experimental artifacts.

ACKNOWLEDGEMENTS

The creative research project “ImGame – An Innovative Digital Environment Based on Research with Elements of Immersive Aesthetics and Serious Gaming” (2022-2025) No. 101054570 was funded by the European Union and co-funded by the Latvian Ministry of Culture in frames of the program “Creative Europe”. Many thanks to Mr. Wayne Chislett for his kind support and copy/line editing.

REFERENCES

- Anestis Anestis (2021). Love Distortion Field. <https://www.flickr.com/photos/146359610@N05/50981607768/>
- Arterritory (2023). Ginta Gabrāna izstāde “Sēņu projekts. Transfungus”. https://arterritory.com/lv/vizuala_maksla/aktuali/26950-ginta_gabrana_izstade_senu_projekts_transfungus/
- Barabási Lab (2019). 150 Years of Nature. <https://www.barabasilab.com/art/work/150-years-of-nature>
- Bekele, M. K., Champion, E. A. (2019). Comparison of Immersive Realities and Interaction Methods: Cultural Learning in Virtual Heritage. In *Frontiers in Robotics and AI*, 6, p. 91.
- Csikszentmihályi, M. (1996). *Creativity*, HarperCollins Publishers. New York.
- Diamantides, P. (2022). Pulse. <https://www.pandelisdiamantides.com/palmos/>
- Előd Jánky, M. (2020). The Dream of Love. http://elodjanky.com/works/to_dream_of_love-hound.html
- Erlmann, V. (2010). *Resonance and Reason: A History of Modern Aurality*, Zone Books. New York.
- Gintere, I. (2020). A Perspective on a New Digital Art Game: The Approach of Research and Knowledge Transfer. In *Proceedings of the 12th International Conference on Computer Supported Education (CSEDU)*, vol. 1, pp. 311-318. Institute for Systems and Technologies of Information, Control and Communication.
- Gintere, I., Biters, K., Viksne, I. (2021). Art Space. <https://artspace.va.lv/>
- Goni, K. (2021). Not Allowed for Algorithmic Audiences. https://www.avgi.gr/enteta/prisma/414143_not-allowed-algorithmic-audiences-ena-ergo-tis-kyriakis-goni
- Iantorno, M. (2023). Super Mario: Clouds. <https://michaeliantorno.com/super-mario-clouds/>
- Jansone, R. M. (2020). Insight. <https://insight.rutemartajansone.com/>
- Janševskis, M., Osis, K. (2023). Knowledge Discovery Frameworks and Characteristics. In *Baltic Journal of Modern Computing*, vol. 11(4), pp. 686-702. https://www.bjmc.lu.lv/fileadmin/user_upload/lu_portal/projekti/bjmc/Contents/11_4_08_Jansevskis.pdf
- Katona, K. (2022). Submerge. <https://katikatona.com/submerge/>
- Kitzinger, G., Mikolai, M., Tardos, H. (2020). Limbo. <https://gaborkitzinger.com/LIMBO>
- Kranidiotis, Y. (2021). Ichographs II – Absentia. <https://kranidiotis.gr/ichographs-ii-absentia/>
- Mäcklin, H. (2021). Aesthetic Self-Forgetfulness. In *The British Journal of Aesthetics*, 61(4), pp. 527-532, <https://doi.org/10.1093/aesthj/ayab019>
- Makransky, G., Mayer, R. E. (2022). Benefits of Taking a Virtual Field Trip: Evidence for the Immersion Principle in Multimedia Learning. In *Educational Psychology Review*, 34, pp. 1771–1798. <https://doi.org/10.1007/s10648-022-09675-4>
- Marxen, E. (2009). Therapeutic Thinking in Contemporary Art: or Psychotherapy in the Arts. In *+e Arts in Psychotherapy*, 36(3), pp. 131-139.
- Misjuns, A. (2022). Peace on Web. <https://mierstikla.100procenti.lv/>
- Mortara, M., Catalano, Ch. E., Bellotti, F., et al. (2014). Learning Cultural Heritage by Serious Games. In *Journal of Cultural Heritage*, 15(3), pp. 318-325.
- Navratil, J. (2018). Szívküldi Lakótelep, <https://www.radiancevr.co/artists/judit-navratil/>
- Ostupe-Dejus, P. (2018). Solution. <http://paulaostupe.mplab.lv/solution/>
- Ostupe-Dejus, P. (2022). Imagination. <https://tribeimmersive.com/gallery/imagination/imagination.html>
- Papamargariti, E. (2020). Uh everything looks so fresh – Oh everything is so rotten! <https://nicoletticontemporary.com/digital/eva-papamargariti/>

- Romanidou, S. (2021). Where Do I Exist. <https://vimeo.com/user68569700>
- Rovithis, E., Mniestris, A., & Floros, A. (2014). Educational Audio Game Design: Sonification of the Curriculum Through a Role-playing Scenario in the Audio Game 'Kronos.' In AM '14: *Proceedings of the 9th Audio Mostly: A Conference on Interaction With Sound*, pp. 1-6. Association for Computing Machinery.
- Szabó, K. (2023). Wrong Data Landscape Vienna. https://www.youtube.com/watch?v=VrSmt-lbruQ&embeds_referring_euri=https%3A%2F%2Fkristoflab.com%2F&source_ve_path=OTY3MTQ&feature=emb_imp_woyt
- Šmite, R., Šmits, R. (2020). Atmospheric Forest. <https://vimeo.com/419593578>
- Zelmene, Z. (2022). A Guide to Invisible Landscapes, <http://rixc.org/en/exhibitions/2015/invisible-landscape-guide-exhibition-by-zane-zelmene/>
- Rodríguez, F. C., Dal Peraro, M., & Abriata, L. A. (2021). Democratizing Interactive, Immersive Experiences for Science Education with WebXR. *Nature Computational Science*, 1(10), 631–632. <https://doi.org/10.1038/s43588-021-00142-8>
- Valianatos, T. (2023). Athens, the Present that did not Exist. <https://vimeo.com/805497040>.