Algorithmic Art and the Transformation of Public Spaces: Hybrid Public Spaces[1]

Algoritmik Sanat ve Kamusal Alanların Dönüşümü: Hibrit Kamusal Alanlar

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Abstract

Algorithmic art, one of the new art forms that emerged in line with the effects of digitalization in the field of art, is not only limited to digital installations integrated into physical spaces or three-dimensional installations in which physical space is transformed through digital images but also offers a hybrid spatial experience through artistic expressions that expand via social networks. When this aspect of algorithmic art is considered together with discourses on the democratization of art, it stands out as an important issue that opens up discussions about the possibilities offered by art in the context of hybrid public space. An inquiry carried out in this direction can offer new expansions within the framework of the "art for everyone" approach. In this study, the dynamics between algorithmic art and hybrid public space are examined using a qualitative research design and a case study method, and a model proposal is presented by evaluating the potential of hybrid public spaces and algorithmic art. In this context, the proposed model is structured within the framework of five basic categories - accessibility, inclusiveness, relationality, personalization of experience and collective sensation - and the art projects of Refik Anadol, one of the leading names in algorithmic art, are analyzed within the scope of this model. Based on the findings, the study demonstrates that constructing hybrid public spaces—particularly in the context of Refik Anadol's projects—significantly enhances the accessibility of artistic experience, fosters a pluralistic approach in artistic expression, dismantles the hierarchy between the work of art and the audience, individualizes the artistic experience, reveals individuals' relationships with other forms of existence, and cultivates a collective sensation in accordance with this relational structure.
Keywords: Algorithmic art, digital art, public space, hybrid public space, Refik Anadol.

Öz

Dijitalleşmenin sanat alanındaki etkileri doğrultusunda ortaya çıkan yeni sanat formlarından biri olan algoritmik sanat, yalnızca fiziksel mekânlara entegre edilen dijital enstalasyonlar veya fiziksel alanın dijital görüntüler aracılığıyla dönüştürüldüğü üç boyutlu kurulumlarla sınırlı kalmayıp, aynı zamanda sosyal ağlar aracılığıyla genişleyen sanatsal

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ifadeler yoluyla da hibrit bir mekân deneyimi sunmaktadır. Algoritmik sanatın bu yönü, sanatın demokratikleşmesi söylemleriyle birlikte ele alındığında, hibrit kamusal alan bağlamında sanatın sunduğu imkânları tartışmaya açan önemli bir mesele olarak öne çıkmaktadır. Bu doğrultuda gerçekleştirilecek bir sorgulama, "herkes için sanat" yaklaşımı çerçevesinde yeni açılımlar sunabilir. Bu çalışmada, niteliksel araştırma deseni ve durum/vaka çalışması yöntemi kullanılarak algoritmik sanat ile hibrit kamusal alan arasındaki dinamikler incelenmekte ve hibrit kamusal alanların, algoritmik sanatın hangi potansiyelleriyle öne çıktığı değerlendirilerek bir model önerisi sunulmaktadır. Bu bağlamda, ilgili model beş temel kategori - erişilebilirlik, kapsayıcılık, ilişkisellik, deneyimin kişiselleşmesi ve kolektif duyumsama - çerçevesinde yapılandırılmış olup, algoritmik sanatın önde gelen isimlerinden Refik Anadol'un sanat projeleri bu model kapsamında analiz edilmektedir. Bulgulara dayanarak, çalışma, özellikle Refik Anadol'un projeleri bağlamında, hibrit kamusal alanların inşa edilmesinin, sanatsal deneyimin erişilebilirliğini önemli ölçüde artırdığını, sanatsal ifadede çoğulcu bir yaklaşımı teşvik ettiğini, sanat eseri ile izleyici arasındaki hiyerarşiyi ortadan kaldırdığını, sanatsal deneyimi bireyselleştirdiğini, bireylerin diğer varoluş biçimleriyle ilişkilerini ortaya çıkardığını ve bu ilişkisel yapıya uygun olarak kolektif bir duyum geliştirdiğini göstermektedir.

Anahtar sözcükler: Algoritmik sanat, dijital sanat, kamusal alan, hibrit kamusal alan, Refik Anadol.

Introduction

Art continues to exist as a means of expression that interacts with the philosophical and technical sources of knowledge of its time. In this process, the definition, content, functions, and social position of art change, and the status of the artist and his/her relationship with the art consumers are transformed. Today, information and technology are the determining elements in this transformation. Given the various conceptualizations that define our era—such as the information society, knowledge society, technology age, global village, and network society (Toffler, 1981; Bell, 1973; McLuhan & Powers, 1989; Castells, 2008)—it is only natural that computer technology has become one of the primary sources of artistic production.

Algorithmic art is one of the art forms that emerged with the integration of computer technology into artistic expressions based on concepts and experience. This art form involves the production of visual art through a technique in which computers operate according to specific steps and predefined procedures (equations, formulas, etc.), namely algorithms (Ceric, 2008; Joo, 2006, p. 1). While some researchers also evaluate traditional art practices based on mathematics and geometry within the scope of algorithmic art (Galanter, 2003; Galanter, 2012, p. 153; Weibel, 2004), today algorithms are predominantly associated with computer-aided artistic productions.

The origins of computer-mediated art practices date back to the 1960s. Researchers such as A. Michael Noll and Béla Julesz used computers to conduct visual experiments. Artists such as Vera Molnár and Max Bense also began to use this technology to realize their own artistic ideas (Daudrich, 2016, pp. 37-38; Klütsch, 2012, p. 66). Algorthymic art—also known as generative art (Al, 2019; Dorin et al., 2012; Galanter, 2012; Pearson, 2011), new media art (Fidan, 2023; Grau, 2021), digital art (Akpınar, 2022; Özel Sağlamtimur, 2010; Bentkowska-Kafel et al., 2005; Paul, 2008) —is increasingly attracting interest through the use of techniques such as artificial intelligence and machine learning, the visualization of a large datasets, and the emergence of novel stylistic approaches. Artists such as Christopher Bauder, Cao Yuxi, Je Baak, Yoshiyuki Abe, Jeremie Bellot, Refik Anadol, Selçuk Artut, Burak Arıkan, Candaş Şişman, Orhan Cem Çetin, Beste İleri and studios such as Universal Everything, Nohlab, Ouchhh, Refik Anadol Studio have drawn attention with such art practices. Understanding the potential of this art form—which draws on complex algorithms and promises distinctive aesthetic experiences—is essential.

One of the most fundamental characteristics of algorithmic art is that it offers a hybrid public space experience. Hybrid public space refers to the overlapping and hybridization of physical and digital spaces, or the expansion of physical space through virtual networks (Forlano, 2013, p. 2; Tan, 2022, p. 210). Today, rather than maintaining a strict distinction between virtual and physical space (digital dualism)—as the divisive tone in the early discourse on cyberspace encouraged—scholars increasingly emphasize the interdependence, relationality, and interactivity of the physical and the virtual (Forlano, 2013, pp. 2–4; Cohen, 2007, p. 211).

Examining the dynamics between hybrid public space and algorithmic art offers valuable insights into emerging trends related to the democratization of art and the aestheticization of everyday life. It also

contributes to an understanding of the broader social and cultural transformations. A review of the literature indicates that most studies on algorithmic art have been conducted under the broader framework of "digital art" (Özel Sağlamtimur, 2010; Fernandes-Marcos et al., 2009; Bowen, 2003; Klinke, 2020; Baca et al., 2019; Bentkowska-Kafel et al., 2005; Akpınar, 2022; Biçer Olgun & Olgun, 2020; Paul, 2008; Grau, 2021), while research explicitly addressing algorithmic art as a distinct category remains relatively scarce (Daudrich, 2016; Ceric, 2008). In particular, studies examining the relationship between digital art and promotion (Diamond, 2019; Paul, 2008) and focusing on the concept of hybrid public space (Tan, 2022; Elbeyi, 2018; Gordon and de Souza e Silva, 2011) are limited in number. This study problematizes the functions of hybrid public space within the framework of algorithmic art. The research is guided by the following questions: What does hybrid public space mean in algorithmic art, and what qualities does it possess? What potential does algorithmic art hold for the construction of hybrid public space, and what transformation potentials regarding the nature of artistic experience emerge from these possibilities?

This study develops a model for the potential qualities of algorithmic art practices within the framework of hybrid public space. It draws on criteria identified by authors such as Benn & Gauss (1983), Van Melik, Van Aalst & Van Weesep (2007), Nemeth & Schmidt (2011), Varna & Tiesdell (2010), and Langstraat & Van Melik (2013) regarding publicity; procedural approaches to publicity (Iveson, 2007); discussions on hybrid public space (Tan, 2021; Elbeyi, 2018); and the concept of "relational aesthetics" (Bourriaud, 2005), which has gained prominence in contemporary art practices. Five basic qualities stand out in the model: Accessibility and dissemination, inclusiveness, relationality, personalization of experience, collective sensation. These qualities constitute the categories of the research.

The study examines Refik Anadol's projects as examples. His internationally recognized and award-winning works, such as *Machine Hallucinations* (2018, 2020, 2021, 2023), and his projects that strongly reflect the hybrid public space dimension of art, were among the reasons for his selection.

The research follows a qualitative research design and a case study. First, Refik Anadol's and Refik Anadol Studio's websites were examined. It was found that 34 of the artist's approximately 60 art projects were tagged as "public art". The projects were grouped into 3 categories based on technical context: (1) Interior and Exterior Architectural Installations, (2) Data Tables and Sculptures, (3) Infinity Rooms or Virtual Reality Experiences. Two examples from each of these categories were analyzed: *Living Architecture - Casa Batlló* (2022, 2023), *WDCH Dreams* (2019) from interior and exterior architectural installations; *Sense of Healing - AI Data Sculpture* (2022), *Machine Memoirs - Space* (2021) from data tables and sculptures and *Machine Memoirs - Space* (2021) [2], *Archive Dreaming - AI Data Sculpture* (2017) from infinity rooms or virtual reality experiences. The selection of these examples was influenced by their recent production dates and the high number of views of their YouTube videos.

The projects were examined in the categories of accessibility and dissemination, inclusiveness, relationality, personalization of experience and collective sensation. In the data collection process, the formal and content elements of Refik Anadol's works, his personal and studio websites, the type and quality of information provided online, and related visuals and videos on YouTube and Instagram were examined. In addition, the artist's statements on various social media platforms and news and interviews about his projects were used.

Algorithmic Art and Hybrid Public Sphere from a Sociological, Cultural, Historical and Communication Perspective

At the intersection of algorithmic art and hybrid public spheres lie the concepts of "data and cyberspace." The prominence of data in modern societies is explained by discussions of the information society. The information society is a concept that emphasizes the social, cultural, economic, and political transformations caused by computer technology (Bell, 1973, pp. 44-45; Toffler, 1981, p. 356; Naisbitt, 1984, p. 22). It is known that computer and communication technologies have transformed many areas, and this change has also led to the emergence of different approaches to the definition and scope of art and public sphere. The use of data,

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[2] Since this project includes both a data sculpture and an infinity room, it is considered in both categories.

algorithms, and artificial intelligence as a means of artistic expression as well as the idea of virtual space as public space, are the results of this transformation.

Today, the distinction between cyber and physical space has been erased, and hybrid public spaces have become widespread. According to Tan (2022), concrete spaces are represented in cyberspace, social media uses location information, and digital data plays a decisive role in the management of physical spaces. Concepts such as "net locality" (Gordon & de Souza e Silva, 2011), "neogeography" (Graham, 2010; Turner, 2006) and "code/space" or "codespaces" (Kitchin & Dodge, 2014; Forlano, 2009) show that physical and digital spaces are intertwined. In some cases, the digital presence of spaces can even surpass their physical presence (Tan, 2022, p. 212). In this context, algorithmic art both contributes to and emerges from the spread of hybrid public spaces.

In the modern era, art has evolved beyond strict rules with artists seeking unique styles, while continuations of past practices are often seen as imitative and devalued (Laletaş, 2020, p. 2256). Art is now considered independent of moral and cultural norms, embracing limitless experiential possibilities, leading to the exploration of new styles (Bell, 1978, pp. 1171-1172). The shift away from rigid formalism and the objectivity of aesthetic value has driven artists toward new forms and artistic experiences centered the idea or concept evoked rather than on the art object itself, as seen in conceptual art (Sarı, 2018, p. 144; Laletaş, 2020, pp. 2255-2256; Koca, 2017, pp. 97-98; Yılmaz, 2005, p. 285). The use of technology in concept-oriented artistic exploration has led to experimental studies and the emergence of algorithmic art. In this process, the idea that art reveals itself through experience and interaction has begun to come to the fore.

As a result, contemporary trends focus on audience participation in artistic performances (Küpeli, 2020, p. 41; Ruşen, 2022, pp. 189-190; Kılıçoğlu & Kahraman, 2022, pp. 747-748). This inclusion blurs the subject-object distinction, making the audience an integral part of the artistic process (Zebracki & Luger, 2019, p. 6). The transformation of artistic performance into an experience is shaped by the relational dynamics between the artist, artwork, and audience (Bourriaud, 2005, pp. 68-74). Audience involvement in artistic production redefines the function, meaning, and impact of the artistic act, and algorithmic art finds its identity within this transformation. Additionally, this shift has altered the spaces where art engages with its audience, with algorithmic art offering new spatial experiences that illuminate the direction of this change.

Algorithmic Art's Relationship with Space

One of the basic characteristics of algorithmic art is that it draws attention to a spatial design that interacts with cyberspace through digital installations placed in physical space. In this art form which offers a hybrid public space experience, space is a part of the artwork. As is known, perspectives that developed within the framework of traditions such as Impressionism, Cubism, and Dadaism, and created a breaking point in art history, have transformed the relationship between artistic expression and exhibition space (Ayaydın, 2015, p. 89; Bayav, 2008, pp. 40-41). Experimental studies within the scope of conceptual art, performance arts, and digital arts, which are increasingly widespread today, have also influenced this transformation. Today, it is generally accepted that the exhibition space has communicative elements that will contribute to artistic expression, contains potentials that will improve the quality and aesthetic value of art, strengthens the functions of the public sphere (Düzünli, Alpak and Tarakçı Eren, 2017, p. 153) and is considered an integral part of the artistic experience (Akpınar and Arslan, 2023, p. 539; Sağlam, 2020, p. 57).

In the classical exhibition logic, areas such as galleries, museums are organized on the basis of abstraction from all external factors that might prevent the work of art from being considered as art. All external elements other than the artwork are withdrawn from the field of attention. Algorithmic art, however, turns space into content and brings everyday life into interaction with the artistic form. Space does not organize art; rather, art organizes space within its own laws. In this context, the integration of space into art can also be considered as an extension of the relational aesthetic understanding. Digitalization and virtual environments have brought new perspectives on the public sphere, as well as on the scope of public art and have placed relationality to the forefront.

In algorithmic art, physical space and cyberspace both exist and do not exist. The stability-based structure of physical space is disrupted by moving images. Conversely, cyberspace reflects the potential of being an unlimited space to the extent that physical space allows. The viewer simultaneously inhabits a

physical space and the artificial reality of cyberspace. Just as space dissolves into art, art also dissolves into space.

A Modelling of the Qualities of Algorithmic Art in the Context of Hybrid Public Space

Hybrid public space aligns with the idea that art should move beyond class distinctions and be accessible to all—a notion historically reinforced by Dadaist critiques (Gürdere Akdur, 2016, pp. 57-58). However, questions arise about whether the mere openness of physical space ensures accessibility and to what extent openness alone defines something as public. Benn and Gauss (1983) identify three core criteria of publicity: accessibility, actor, and benefit. Accessibility refers to access to a place, space, information and resources. The determining factor in the public-private distinction is who is in control. The actor criterion is related to this issue. The benefit criterion concerns the extent to which the matter provides public or private advantage. Van Melik, Van Aalst, and Van Weesep (2007) investigated how public spaces are shaped by dynamics of "fear" and "fantasy," influencing their transformation. For this, they identified six key criteria: surveillance, restrictions on loitering, regulation, events, fun shopping, and sidewalk cafés. Nemeth and Schmidt (2011) analyzed publicness by assessing the private sector's influence, defining three fundamental criteria: ownership, management, and uses/users (p. 20). Varna and Tiesdell (2010, pp. 585-586) developed the "star model," which evaluates publicness based on meaning, ownership, control, urbanity, physical configuration, and animation; that serve as a framework for assessing different public spaces. Additionally, Langstraat and Van Melik (2013, pp. 446-447) also examined publicity through ownership, management, accessibility, and inclusiveness.

Across these perspectives, participation and pluralism emerge as key factors in defining publicness. Consequently, in artistic projects where participation is central, the openness or closure of physical space may be secondary to the goal of accessibility. Procedural approaches to public space, such as Iveson's (2007, pp. 3-4, 9-10), emphasize not the physical openness of a space but its ability to become publicly visible and accessible. In this context, the expansion of hybrid public space into cyberspace is significant for accessibility and inclusiveness.

Tan (2022, pp. 214-218) categorizes the interactive nature of hybrid public space into three aspects: Filtering, Expansion, and Separation/Personalization. The author expresses that with filtering, individuals have the opportunity to frame their digitally supported urban experience (by filtering the acquired information) from different perspectives, and thus their experiences differ for each individual. Filtering is most clearly understood in the context of Google Maps and navigation applications. People experience spaces in line with the directions of these tools. By the concept of diffusion, the author means the expansion of urban experience into cyberspace, transforming the nature of physical experience. In a hybrid public space, the participants of the events consist not only of those physically present in the space but also of those experiencing the event virtually. In addition, hashtags, comments, likes, and discussions shared on social media channels also expand the spatial experience into cyberspace. In the context of distinction/personalization, Tan emphasizes that individuals make their physical experiences more personal with mobile devices, social media, or other types of tools. In short, people experience a filtered, hybridized, and personalized public space in modern urban spaces.

The rise of trends that encourage audience participation in artistic expression is important in the context of algorithmic art and hybrid publicity. Hybrid public space enhances interaction between the artwork, audience, and artist, particularly in algorithmic art, aligning with Bourriaud's (2005) concept of relational aesthetics. Algorithmic art projects and AI-supported video art in hybrid spaces—accessible online and shaped by audience participation—embody relationality and engagement. In this context, the interactive nature of hybrid public spaces plays a key role in fostering inclusiveness and personalizing artistic experiences.

Another element in examples of algorithmic art is the emphasis on "collective sensing". Collective sensing, at its most basic, refers to the qualities of the artwork that enable the development of empathic sensitivity towards others, the development of a sense of unity and togetherness, a difference-based relationality, and the sensing of the "other". Semahat Ece Elbeyi's (2018) thesis, #Metoo's Ideological

Robots: Towards a Hybrid Public Sphere Theory, provides valuable insights into this concept. In her research on bot accounts, Elbeyi states that in these environments where non-human actors are also included in public dialogues, the concept of a conventional/traditional public is being transcended. The author claims that this public is a hybridized public. According to Forlano, hybrid public spaces are structures that contain networks of human and non-human actors (digital actors). Digital actors find their identity not in discrete activity layers but in a network of interdependent and dynamic relationships (2013, p. 3).

Interpreting the hybrid public sphere from this perspective involves a posthumanist understanding. As the impact of artificial intelligence in our daily lives increases, ways of thinking about machine-human interaction continue to gain different dimensions. In this context, it can be interpreted this interaction through an ethical understanding within the framework of anti-anthropocentrism. Thinkers such as Rosi Braidotti (2014, p. 61), Donna Haraway (2006: 4-5), Gilles Deleuze (Deleuze, 2007, pp. 10, 84), who are prominent in posthumanist discussions, have tried to emphasize an anti-essentialist subject idea based on the principle of interspecies equality instead of an essentialist subject idea that establishes a hierarchy between species such as human, animal, nature, machine, etc. It can be said that algorithmic art also can be a way for different social or political understandings based on pluralism as well as posthumanist ethics. For example, many traditions of thought based on dialogue between equals, such as Habermas's theory of communicative action[3] and Bakhtin's concept of carnivalesque[4], can be discussed in relation to algorithmic art and the construction of hybrid public spaces. Based on all these approaches, hybrid public spaces come to the fore with 5 basic qualities in algorithmic art forms: Accessibility and dissemination, Inclusiveness, Relationality, Personalization of Experience, Collective Sensation.
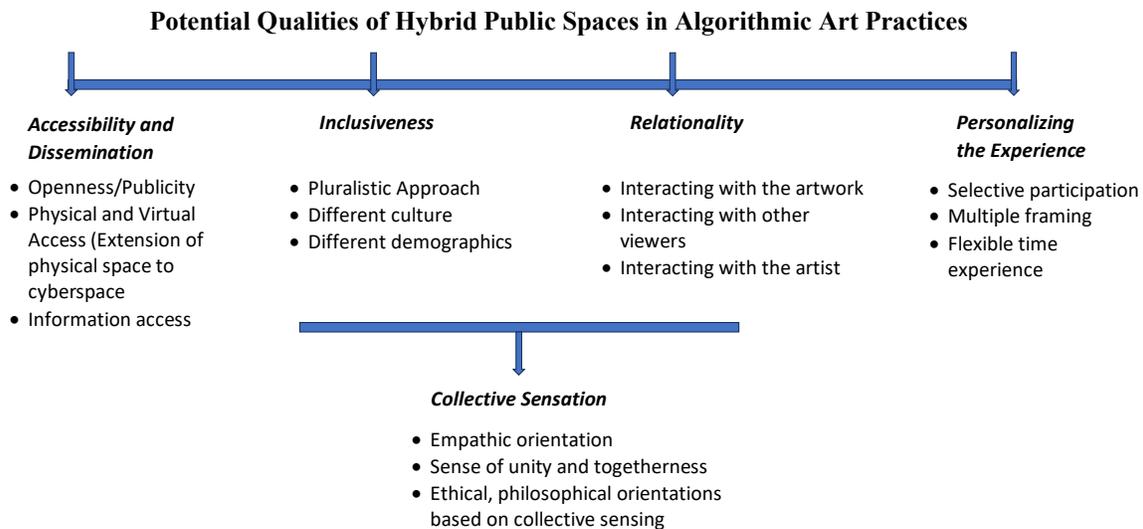
Potential Qualities of Hybrid Public Spaces in Algorithmic Art Practices

Accessibility and Dissemination

- Openness/Publicity
- Physical and Virtual Access (Extension of physical space to cyberspace
- Information access

Inclusiveness

- Pluralistic Approach
- Different culture
- Different demographics

Relationality

- Interacting with the artwork
- Interacting with other viewers
- Interacting with the artist

Personalizing the Experience

- Selective participation
- Multiple framing
- Flexible time experience

Collective Sensation

- Empathic orientation
- Sense of unity and togetherness
- Ethical, philosophical orientations based on collective sensing

Figure 1: Potential qualities of hybrid public spaces in algorithmic art practices

Hybrid Public Spaces in Refik Anadol's Projects

Accessibility and Dissemination

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[3] According to Habermas (2002), communicative action that expresses the right to political expression is one of the fundamental building blocks of the public sphere.

[4] The concept refers to questioning traditional norms with humor and irony and to a non-hierarchical, polyphonic, heterogeneous dialogue environment (2001, p. 186).

Within the scope of the accessibility category, the spatial elements and digital dissemination status of each project were examined. The country, city, and location information of the projects were listed and interpreted in the context of accessibility discussions. In terms of digital dissemination, each project's images, videos, and explanatory texts on the website were examined. In addition, each project's YouTube and Instagram posts were identified, and the posts were listed along with the type of content (photo, video), and the number of views or likes. The dates and explanatory texts of the posts related to the projects were recorded. All posts in the year the project was carried out in Instagram data were examined and the information about the posts related to the determined projects was listed.

While the fact that the projects are largely realized in the city center and in public places is important as the clearest indicator of accessibility, in the context of hybrid publicity and digital dissemination, the website is a remarkable medium in these projects. The comprehensive, high-resolution videos of the sample projects discussed, shot from different angles, are available on both the artist's and the studio's websites. Numerous visuals, data-related graphics and information of all the works are also shared on the website.[5] For example, the video of the *WDCH Dreams* project from the interior and exterior architectural installations category begins with a drone shot showing the public space from a wide angle, and information about the project is used as a caption (Image 1). The presentation of the architecture from different angles, together with the audience, and with distant and close-up images as well as music allows for an understanding of the details of the public space.

Image 1: A shot from minute 04:03 of the video of the WDCH Dreams (2019) project
(https://refikanadol.com/works/wdch-dreams/; Access Date: 01.05.2024)

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[5] http://refikanadol.com; http://refikanadolstudio.com

Image 2: A shot from minute 00.05 of the Sense of Healing - AI Data Sculpture video;(https://refikanadol.com/works/sense-of-healing-ai-data-sculpture/; Access Date: 08.05.2024)

Image 3: A shot from minute 02.20 of the Machine Memoirs-Space project video (https://refikanadol.com/works/machine-memoirs-space/; Access Date: 25.05.2024)

The accessibility of artwork through video and visuals is key to extending the public experience into virtual space. The videos of *Sense of Healing* (Image 2) and *Machine Memoirs-Space* (Image 3) include project music and wide-angle shots of the spaces. High image and sound quality enhance the representation of public space in cyberspace. The presence of a viewer in both images invites those experiencing the work digitally to empathize with those in the physical space, offering a hybrid experience combining the physical and digital realms.

The videos indicate an effort beyond simply introducing the artwork or the artist. The hybrid public space, which is a part of artistic expression, attracts attention with the art experience that continues in the virtual space. In a way, the virtual space expands the scope of the art experience as an extension of the physical space.

A key element that elevates the hybrid public space experience in the artist's works is the sharing of details about the creation process, including information about the data used, the steps of the works, and related visuals on the website. This data is made publicly accessible as part of the artistic experience. The algorithms used are also shared on personal and studio websites. These offerings demonstrate that the art experience extends beyond the physical space, with virtual sharing serving as an extension of the artistic process. The art experience is as if it is not completed before accessing information about the data transformed into visuals and its details. This situation makes the art experience open to development and maturation, and the artistic experience has the potential to mature in the virtual space, transcending the physical public space.

Table 1: Youtube viewing rates of projects *(This table was created by the researcher.)*

Project Name	Most Viewed Video Link	View Rate (06.05.2024)
Living Architecture: Casa Batlló	https://www.youtube.com/watch?v=oOsAexs6Bl4&t=120s	56.921
WDCH Dreams	https://www.youtube.com/watch?v=FKfCrChDWpY	74.492
Sense of Healing - AI Data Sculpture	https://www.youtube.com/watch?v=EipWaSUWLkc	21.892
Machine Memoirs - Space	https://www.youtube.com/watch?v=kqbJTIEStDk	42.240
Archive Dreaming - AI Data Sculpture	https://www.youtube.com/watch?v=ULaUfe2oIMk	20.618

It is noteworthy that all of the projects discussed are widely shared on YouTube (Table 1). According to the data on 06.05.2024, the video of *WDCH Dreams*, which has been viewed the most (74,492), was published on both the Los Angeles Philharmonic Orchestra's own website and YouTube channel. This video is a full HD version of the entire event. This event, which took place in a public space, continues in the digital space with full HD images.

In a video from the Archive Dreaming project[6], a person's project experience is shown over a long period of time. There is a detailed display of the work with images from different angles and close-up details. With these images, a similar physical experience continues in the virtual space. Considering that accessibility is not only about concrete, physical contact, and that the possibility of discovering qualitative details can also be considered within the scope of accessibility, it can be said that images and informations containing such details strengthen the accessibility quality of the works.

Table 1: Instagram data of projects *(This table was created by the researcher.)*

Project Name	Event Date	Number of Posts	Post Date	Number of Likes
Living Architecture-Casa Batlló	7 May 2022 (Barcelona)	1 (1 video, 3 foto)	23 April 2022	33951
		1 (1 video)	30 April 2022	27447
		1 (1 foto)	5 May 2022	38346
	30 April-13 May (New York)	1 (1 video)	6 May 2022	22692
		1 (3 video, 2 foto)	8 May 2022	72719
		1 (1 video, 6 foto)	9 July 2022	61217
		1 (1 video)	31 December 2022	50398
	05 Mayıs 2023 (Barcelona)	1 (4 foto)	29 April 2023	53623
		1 (1 video)	16 December 2023	170670
		1 (4 video, 3 foto)	6 May 2023	651520
WDCH Dreams	27 September 2019	1 (1 video, 4 foto)	27 February	14074
		1 (2 video)	1 October	18972
Sense of Healing - AI Data Sculpture	23 July 2022	1 (1 video)	23 July 2022	15876
		1 (1 video)	28 July 2022	27892
		1 (2 video)	31 July 2022	26629
Machine Memoirs – Space	19 March 2021 – 26 April 2021	1 (2 video, 8 foto)	10 July 2021	28531
		1 (2 video)	9 June 2021	17624
		1 (4 video)	24 April 2021	33102
		1 (1 video)	10 April 2021	129120
		1 (2 video)	5 April 2021	29171
		1 (4 video)	27 March 2021	43492
		1 (2 video, 2 foto)	18 March 2021	59364
		1 (1 video)	06 March 2021	31164
		1 (1 video)	27 February 2021	36270
		1 (1 video)	06 February 2021	20486
		1 (1 video)	06 February 2021	20486
Archive Dreaming - AI Data Sculpture	20 April 11 July 2017 (Istanbul) 09 September 2017 (Linz)	1 (1 video)	04 Aralık 2017	2.241
		1 (1 video)	24 August 2017	1.655
		1 (1 video)	06 June 2017	1.327
		1 (1 video)	01 June 2017	820
		1 (1 video)	30 May 2017	1.246
		1 (1 foto)	24 May 2017	621

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[6] https://www.youtube.com/watch?v=tW7Mq3-ME3U; Access Date: 26.05.2024

1 (1 video)	11 May 2017	1.210
1 (1 video)	03 May 2017	845
1 (1 foto)	23 April 2017	983
1 (1 foto)	14 April 2017	624

Most Instagram posts related to the projects feature videos (Table 2), with even pre-event posts simulating the venue, offering a virtual experience before the physical one. This creates an expectation that shapes the experience when a person visits the event venue. The combination of image and sound further bridges the gap between the virtual and physical spaces, strengthening the interaction between them. These posts are crucial for both accessibility and the hybrid public space experience.

In most of the projects, it has been determined that posts shared close to the event date receive more likes. For example, in the *Living Architecture-Casa Batlló* study, the post that received the highest number of likes (651520) is the post containing the event video shared on May 6, 2023, one day after the event day on May 5, 2023. The same project was also implemented in 2022. Among the posts shared throughout 2022 regarding the event on May 7, 2022, the post shared on May 8, 2022 received the most likes (72719). Similarly, most of the Instagram posts of the Archive Dreaming project were made during the months of April, May, and June, when the project was open for display. It is also seen that the video of this project published on YouTube on April 20, 2021 and the Instagram videos published on or after April 23 were accessible during the same time period following that date. In these examples where virtual spaces and physical spaces overlap, the hybrid public space experience is more evident.

Inclusiveness

In evaluating inclusiveness, several factors were taken into account, including the qualitative characteristics of the projects, artists' statements published on various websites and social media platforms, and audience feedback from sources such as YouTube and Instagram. A crucial determinant of inclusiveness is the active participation of individuals from diverse linguistic, racial, and cultural backgrounds in the production process. Refik Anadol's personal and studio websites highlight the studio's pluralistic approach to art, as in the following statements:[7]

> Refik Anadol Studio consists of designers, architects, data scientists, and researchers with different professional and personal backgrounds, who adopt the principles of inclusiveness and equality at every stage of production. Studio members come from 10 different countries and can speak a total of 15 languages fluently. The Studio's internship program also demonstrates a strong commitment to mentoring young people with diverse personal experiences, values, and worldviews.

This multicultural structure is important in terms of the potential for appreciation levels based on cultural differences to be included in the artistic production process and for the idea and creativity dimension of the projects to pass through a multicultural dialogue filter.

Although the works have a conceptual art dimension in terms of content, they do not require an intellectual background for appreciation. The visual and sound elements—such as color diversity, fluid imagery, large-scale displays, and music—appeal to a broad range of viewers, regardless of their knowledge of the content. For example, the *Living Architecture-Casa Batlló* project featured an installation in a riot of colors, harmonizing with the building's historical features. In the Sense of Healing project, qualities like geometric form, fluid imagery, color variations, and large-scale presentation create interest even without understanding the complex techniques or philosophical tendencies behind it. Similarly, the Archive

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[7] https://refikanadol.com/information/; https://refikanadolstudio.com/studio/; Access Date: 16.05.2024

Dreaming project, with its fluid visuals, interactive data direction, and mysterious atmosphere, captivates viewers with various tastes.

In addition, academic studies in which the artist's projects are associated with the "sublime" an important concept in Kant's aesthetics (Denson, 2023; Stallabrass, 2021) also shed light on the inclusive potential of these projects. As is known, Kant considers the concept of the sublime in a different context from the concept of beauty, which he associates with purely aesthetic pleasure, and suggests that the pleasure created by the sublime has a moral value. According to Kant, the sublime is first related to the feeling of being overwhelmed by the grandeur, magnificence, and splendor of nature. The fear created by grandeur and splendor reveals a suprasensory dignity and happiness (Arat, 2013, pp. 81-82). Denson also thinks that there is a sublimity in Anadol's works that exceeds the individual and threatens to swallow the observer. The author states that the magnificence in the artist's works includes an aesthetic pleasure that pushes the mental capacity and limits, on the one hand making the viewer feel small; on the other hand, turning this smallness into admiration (2023, pp. 160-161). According to Denson, the images on the artist's website, where a single person is positioned as the viewer, also reflect a sublimity that will transfer the feeling of magnificence to the online participant through identification (2023, p. 159). Similarly, Stallabrass (2021, p. 86) states that Anadol's works carry a dynamic sublimity that creates an imaginary vision, and thinks that this sublimity "gives the impression of a Renaissance specialist's feverish dream in an infinite loop." The emphasis on sublimity in Anadol's projects gives an idea about the inclusiveness potential of the works.

Refik Anadol uses the phrase "art for everyone" on many different platforms. For example, the artist uses the following expressions in his tweet on May 5, 2023, for the *Living Architecture - Casa Batlló* project: "Thank you very much Barcelona! We felt the true love and power of public art together and honored Gaudí's genius! Art for everyone, every age and culture! Thank you and see you soon."[8] It is also understood that the artist concretized this idea in a mini documentary called "The Transformation of Art" with the following words:[9]

> For me, art should be responsible for addressing everyone, every age and every culture... It is a very difficult claim, I know. It's like finding a language like mathematics. But when you can do that, you have the chance to touch both the mind and soul of a person while experiencing that work... The work is understood and gives the viewer a feeling.

In the context of inclusivity, social media feedback on the artist's projects provides valuable data. Instagram comments, for example, show engagement from diverse cultural backgrounds in multiple languages, including English and Turkish. For instance, the November 4, 2023, post on *Machine Hallucinations - Sphere* drew attention from an international audience.

Relationality

When the relational dimension of the projects is considered in the context of the interaction between the artwork and the audience, two elements stand out. The first is that the content context of the projects is based on a "collective memory" constructed from data. This situation highlights the relationality between the experiencers. In other words, the fact that the data used in the projects are digital data related to environmental conditions that are accessible to everyone, that everyone is involved in and is affected by or affected by, such as space, weather conditions, wind movements, archives related to nature, or cultural, historical, artistic images that have a place in the social memory, implies a relationality focused on the visualization of collective memory.

587,763 images, 1,880 videos, 1,483 metadata files, and 17,773 audio files are used in the *WDCH Dreams* project. The datasets in the content of all these files consist of La Phil's historical records, in other words, its memories. This study reveals "consciousness" of the Walt Disney Concert Hall metaphorically;

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[8] https://twitter.com/refikanadol/status/1654582203190325249; Access Date: 15.05.2024.

[9] https://www.youtube.com/watch?v=4j09jfe51-k; Access Date: 28.05.2024.

it expresses the synergistic relationship between institutional memory, which takes a new form as image and sound, and architecture.[10] The data in question consists of images of people from many fields, such as audiences who have been in the concert hall, employees who have taken part in events, artists and musicians who have taken the stage, and these images become the basic elements of a holistic, aesthetic structure in Anadol's work. The artist (2020, p. 82) also states that this visualization enables people and architecture to interact intuitively.

Image 4 and Image 5 include images from the data used in the project. As can be seen, these images related to the history of the space come together within an artistic composition. The visualized work interacts with the spatial experience of many people. The construction of a hybrid public space has an important role in reflecting the qualitative relationality of this art project. Through the data shared on the website—written explanations, images, and videos—the interaction gains an understandable and tangible dimension. A relationality can be mentioned in which the psychology of being a community, a mass is reflected for the audience who are not in the archive used in the work. In fact, artistic experience transcends physical space and continues in virtual space.

Image 4: WDCH Dreams, Database Archive
(https://refikanadol.com/works/wdch-dreams/ Access Date: 12.07.2024)

Image 5: WDCH Dreams, Database Archive, Close-up
(https://refikanadol.com/works/wdch-dreams/; Access Date: 12.07.2024)

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[10] https://refikanadol.com/works/wdch-dreams/; Access Date: 12.07.2024

In *the Archive Dreaming* project, more than 1,700,000 documents in Salt Araştırma's archive collection were visualized. The project, which was carried out with public archive data on the 1st floor of SALT Galata, a public venue, invites a relationality based on history, culture and collective memory. This is expressed as follows on the artist's website: "… the main idea is to create an immersive installation with architectural intelligence that will reframe memory, history and culture through the lens of machine intelligence in the 21st century museum perception."[11] The visuals and data on the website embody a relationality in the context of culture, history and collective memory. This relationality based on collective memory is also frequently present in the artist's discourses. On his studio website, the artist includes the statement "this machine represents hallucinatory images, collective memory, hidden layers of history and the consciousness of a city that cannot be seen otherwise" among the data belonging to the *Living Architecture-Casa Batlló* projects.[12] In the video in Tom Simonite's news on the website Wired, the artist also emphasizes the artificial intelligence technology he uses in his works and defines the composition consisting of hundreds of images of New York City that he uses in his work as a kind of collective memory.[13] Apart from the website and news, the artist also emphasizes "collective memory" in interviews and various videos.

The second important element in the context of the interaction between the artwork and the viewer is related to the viewer directing the artistic performance in the process of aesthetic experience. In some of the artist's projects, the viewer can transform the flow of the work with their physical presence, movements or personal preferences. In this case, the viewer, who affects the works that transform the space/architecture, directs the interaction they establish with the work by experiencing the hybrid space. *The Archive Dreaming* project exemplifies this type of quality.

Archive Dreaming (Image 6), there is an interactive data visualization in which the viewer's movements are tracked in real time and the work responds to the viewer's locational data or they can direct the movement of images/data flowing around the viewer.
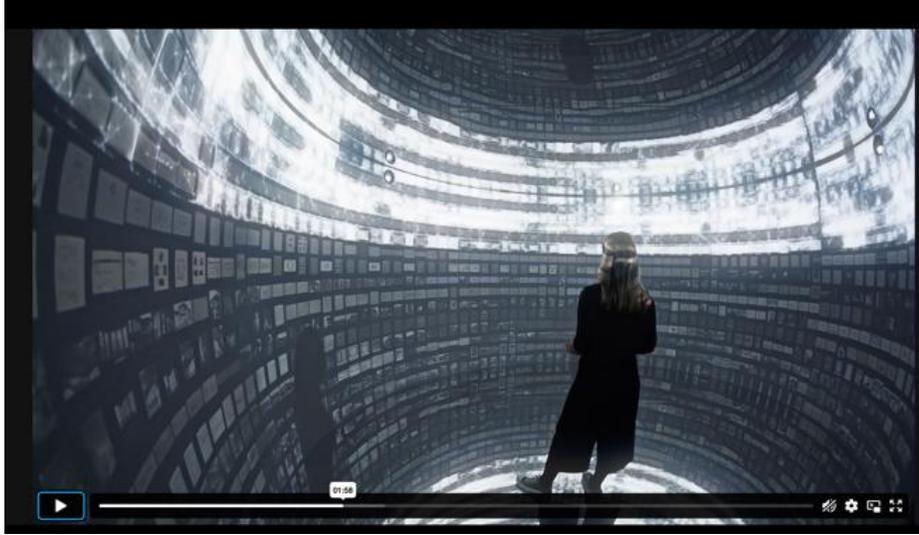

Image 6: Archive Dreaming — AI Data Sculpture/ 2017
(https://refikanadol.com/works/archive-dreaming/; Access Date: 29.05.2024)

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[11] https://refikanadol.com/works/archive-dreaming/; Erişim Tarihi: 12.07.2024

[12] https://refikanadolstudio.com/projects/renaissance-dreams-palazzo-strozzi/; Access Date: 12.07.2024; https://refikanadolstudio.com/projects/living-architecture-casa-batllo/; Access Date: 12.07.2024

[13] https://www.wired.com/story/artist-refik-anadol-turns-data-art-help-ai/; Access Date: 12.07.2024

Personalization of the Experience

It can be said that the most important element in personalizing the experience is the artist's website posts. In the virtual experience, which expands the experience in the physical space by taking it to a different point, personal preferences make the experience different for each viewer. The viewer can stop the liquid video at any point, rewind it, zoom in or out on a section of the video or visuals and direct the viewing experience. The order in which the videos or visuals are experienced and which points they focus on vary from viewer to viewer. Of course, it can be said that the experience in the physical space is also personalized at the level of perception, but this art form and its relationship with the hybrid public space add a different dimension to this personalization. For example, there are three videos on the website of the *Living Architecture-Casa Batlló* project. One is a documentary style video showing the event process, the other is directed by Oscar Criado and includes the artist's views and information about the event; and the third is a video showing images of the installations on simulated versions of Casa Batlló. In addition to the videos, the site includes 23 high-resolution images, data, and diagrams/graphs that visualize information about the application process. Navigating through all these images and data requires entails many personal preferences. There may be preferences such as whether to pay attention to the images or the information first, whether to watch all or part of the videos, whether to zoom in or out on some sections, or whether to give feedback between the video and data. These preferences personalize the viewer's experience of the project.

The Machine Memoirs: Space project can also be given as an example of the personalized experience process mentioned. The web page includes a video and 12 high-resolution photographs containing the infinity room section of this project. In addition, various information, diagrams, and figures related to this section, referred to as Machine Memoirs V2: AI Cinema, are also included. As with other projects, experiencing this project on a virtual platform varies according to personal priorities. The viewer's order of priority determines the composition that forms in the mind about the work. Therefore, this art experience gains a personalized dimension for each viewer. The experience within this category is also quite personalized in physical space. This is because the viewer cannot focus on all the fluid images surrounding them in three dimensions with the same intensity of attention. Therefore, the position where the person stands and the direction of their gaze personalize the experience.

The most striking aspect of the personalization of the experience is the viewer's ability to direct the flow of the installation, which has also been mentioned in the "relationality" discussions. As mentioned before, this situation also stands out in the *Archive Dreaming* project. The relationality also draws attention in different projects such as *Quantum Memories* (2020), *Latent Being* (2019), and *Dataland* (2019), which are excluded from the study. In these projects, the viewer's physical movements or the priorities among the options offered to them transform the experienced visuality. The viewer has a personalized experience by transforming the composition in the presentation of the visuals with the help of a console or by interacting with artificial intelligence installations that follow their physical movements in real time. This situation constitutes an important dimension of the personalization of the experience as an example where the work is personalized qualitatively.

Collective Sensation

Collective sensation comes to the fore primarily in relation to the context of the works. For example, the *Machine Hallucinations: Sphere* project was created from an archive containing images of space and nature. In the *Living Architecture-Casa Batlló* project, real-time climate data from the city was collected for the exterior installation. In the *WDCH Dreams* project, archive images of the Walt Disney Concert Hall were used. It can be said that all these projects invite a collective sensation on the axis of nature, culture, and history.

Data visualizations based on nature point to contexts such as the position of humans in nature and their interaction with other existences, invite the viewer to think about their existential connection with others (other humans and everything else in nature) and to remember the responsibilities that come with this

connection. In addition, questions about what it means to be human, focusing on the interaction of humans with machines, are also important in the artist's artistic expression. Attention is drawn to these tendencies of the artist in different news platforms. For example; in a news article about Refik Anadol on the website Designboom, it is stated that "the artist reminds us that artificial intelligence is supported and guided by humans as a form of existence, that our relationships with other minds – both human and artificial – depend on what we understand from artificial intelligence."[14] This comment mentions the artist's presupposition that there is a relationality between humans and non-humans. This orientation of the artist in terms of content seems to be in harmony with the posthumanist ethical framework that writers such as Rosi Braidotti (2014), Donna Haraway (2006), and Gilles Deleuze (2007) position against the species hierarchy. The hybrid public space has an important role in the construction of this approach of the artist. Because the ethical-philosophical foundations of the projects presented in physical space can be more easily grasped through their extensions in virtual space. The increase in understanding of this ethical orientation can be interpreted as the spread of collective perception among the audience.

In Anadol's works, a dimension of collective sensation is also attempted to be constructed in the context of culture and history. For example, while Salt's archive data emphasizes our historical connections in *the Archive Dreaming* project, *the Machine Memoirs: Space* project reminds us of our connection to places in the universe that we can never reach with data obtained from NASA telescopes. The Infinity Space project, which consists of a collection of different works such as *Archive Dreaming, Melting Memories*, and *Bosphorus*, brings together different data sets from nature data and the neural networks of the human brain, from weather conditions and wind data. In this way, attention is drawn to the different connection points that people have to nature and each other. In addition, in the previously mentioned "Interdisciplinary Encounters" panel of Boğaziçi University, the artist stated that "by focusing on collective memories and our collective memory, they tried to look at memories that they thought belonged to humanity rather than personal data" in the Archive Dreaming project, and mentioned the potential of the work to draw attention to the connection between people.[15]

In an Instagram post shared on November 21, 2022 within the scope of *the Sense of Healing* project, the artist's idea of aiming for collective sensing is expressed as "... We hope that this work will support our collective healing with the power of imagination."[16] Based on all these explanations, the supporting role of the hybrid public space is important in the context of the projects' goals based on collective sensing. The artistic experience process, which becomes qualified in a connectivity in which the physical and the digital overlap, increases the potential for collective sensing. This situation is also an indication that algorithmic art can be a way to raise socio-political awareness. Kang (2019), who conducted comparative research on Krzysztof Wodiczko and Refik Anadol, also talks about the potential of the screens that make up Anadol's works to be connection points or relational interfaces between embodied voices that allow for different degrees of empathy and encounter possibilities, and to increase and activate socio-political awareness, activism, interaction.

Conclusion

Anadol's projects are hybrid spaces that overlap the physical and the digital in that they are based on the visualization of digital data in a physical space. The fact that the works and their data are publicly accessible in virtual space is an important feature that makes the spaces where the works are exhibited hybrid public spaces. In order to examine the potentials of these hybrid public spaces in detail, an evaluation was made in the five aforementioned categories (accessibility and dissemination, inclusiveness, relationality, personalization of experience, collective sensation). As a result, in the examination made with examples from Refik Anadol's projects, it was determined that the construction of hybrid public spaces has important

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[14] https://www.designboom.com/art/refik-anadol-latent-being-kraftwerk-berlin-11-30-2019/; Access Date: 16.07.2024

[15] https://www.youtube.com/watch?v=1tsWnsrZeZU; Access Date: 19.07.2024

[16] https://www.instagram.com/p/ClO3aMfOagN/; Access Date: 19.07.2024

potentials in the contexts of; increasing the accessibility of algorithmic art, encouraging the participation of people from different demographics and cultures, in other words, popularizing a pluralistic approach in artistic expression; and increasing the acceptance of the relational aesthetic understanding rather than the hierarchy between the artist-artwork and the audience in artistic experience. In addition, it is seen that the construction of hybrid public space within the scope of algorithmic art is also remarkable in the context of popularizing an understanding of art that makes the artistic experience separate and personal for each experiencer; developing awareness about the relationality of people with other people and existences (land, water, air, animals, etc.) and creating a collective sensation that reminds us of the responsibilities required by this relationality.

Technology, which radically transforms the dynamics of daily life, also provides an important source for new trends in artistic expression. The potentials of algorithmic art, which comes to the fore with the visualization of digital data, which affect the transformation of the public space and therefore daily life are seen in the projects of Refik Anadol. It is known that art in the public sphere has an important role in the aestheticization of daily life and the democratization of art. The prominence of hybrid publicity in Refik Anadol's projects is important in the context of contributing to these functions of public art.

Refik Anadol's work has also been subject to criticism, with claims of a "lack of feeling" and "superficiality." Some writers and art critics find the artist's work emotionally and intellectually unsatisfying. For example, according to Hervé Lancelin (2024), Anadol's "his monumental works are merely empty cathedrals where algorithms replace thought. A dazzling spectacle that celebrates technology while draining art of its critical substance and depth." New York Magazine's senior art critic, Jerry Saltz (2023), also likened Anadol's works to screensavers, describing them as instant entertainment. However, the artist's works and aesthetic style are remarkable in terms of thinking about the potential of hybrid public spaces in the context of algorithmic art and understanding the direction of social and cultural transformations. They contribute to the analysis of transformations in the conditions and actors of artistic production.

This study demonstrates that algorithmic art contributes to the context of hybrid publicness in terms of the trends in which the hierarchy between the work of art and the audience is gradually disappearing and a pluralistic approach in the construction of artistic expression is becoming increasingly widespread. However, there is a need for research analyzing the views of the audience on the subject. Therefore, it is recommended that researchers interested in the subject focus on studies in which interviews are conducted with those who experience the projects in the context of hybrid publicness. In addition, new studies focusing on the economic-political context of algorithmic art and production processes can shed light on different dimensions of the subject.

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