

# The Development and Direction of Public Art in the Digital Age: Form Three Spatial Forms

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**Abstract.** The digital age has brought about changes in human lifestyles and cognition, which has triggered new technological and social issues. Within this context, both the form and content of public art have undergone transformations. Public art in the digital age has shifted from traditional forms such as sculptures, murals and architecture that is static, fixed and permanent to non-static, non-fixed and non-permanent forms. This article draws on Henri Lefebvre's three spatial concepts, this paper proposes three spatial forms of public art: material space (reproduced space), spiritual space (presence space) and virtual space (digital space). It delves into the development of public art in the digital age, from a superficial to a profound exploration and seeks to propose a type of public-digital art with multiple forms and meanings, which signifies the direction of public art in the digital age.

**Keywords:** Digital Age, Public Art, Spatial Forms

## 1 Introduction

The cultural concept of public art was originally associated with culture and politics. It first emerged in the United States in the 1960s, alongside initiatives such as the National Endowment for the Arts and the National Endowment for Art, which advocates for activities like Art in the Public Sphere, Art in Architecture, and the Percent for Art programmes.

Grant Kester in 'Art and the Public Sphere in America' proposed that public art must possess three characteristics: firstly, it must exist outside of official art institutions; secondly, it must engage with the audience; and thirdly, it must be sponsored by public institutions or the public itself, thus highlighting the spatial and public nature of public art [1]. In the age of digital technology, public art has seen new forms of expression and has triggered new social issues, generating new considerations based on space.

## 2 Historical Shifts and New Forms: The Origins and Development of Public Art

### The emergence and development of public art

The roots of public art can be traced back to the ancient Greco-Roman period, which saw the emergence of a relatively open slave democracy and public spaces, as well as public buildings such as temples, theatres, stadiums and monumental sculptures/monuments.

In the religious context of ancient Greece, the relationship between humans and gods was in a state of relative harmony. However, with the existence of free individuals, there were also slaves, which indicates partial rather than absolute equality. During this period, religion constituted a significant component of society, serving as the dominant ideology of society at that time and public architecture in this period reflected the supreme divine authority.

The prerequisites for public art were established in the 18th century: the public sphere and the public.<sup>1</sup>[10] The public sphere, as a space where thoughts, opinions and information could flow freely, formed a crucial core for public art. The salon art that emerged in Paris in the 1730s initially served the educational needs of the women who founded these salons but later evolved into a space for the public<sup>2</sup>[9][4] to freely critique artwork, providing a platform for free comments on art and facilitating public discussion. This led to the gradual emergence of public consciousness, which transformed into descriptive and analytical discourse accepted by the public, laying the groundwork for public art.

Entering the period of postmodernism, the elite modernist art began to dissolve, art popularisation appeared, and public art also involved social spaces, for example, Oldenburg's 'Spoonbridge and Cherry' and Alexander Calder's 'Flamingo'. However, these works still existed in relatively fixed forms; their influences were based on spatial forms, shifting from traditional art exhibition spaces to new spaces, although the conceptualisation of space remained largely unchanged at this point.

Entering the 21st century, technology has changed human lifestyles and the cognition of human beings and has concurrently triggered new technical problems and social issues. In this context, the form and content of public art have undergone transformations. In the digital age, public art no longer adheres to static forms, but shifts towards transient and ephemeral non-fixed forms, signifying the addition of a temporal dimension to spatial concepts at this juncture.

### **3 Instability and Impermanence: Public Art in the Digital Age**

In the context of the digital age, technological innovations have enriched the forms and content of public art. The art in traditional spaces is presented through new media, expanding the expression of material art into informational imagery and transforming original static art into dynamic multi-dimensional models.

In terms of form, the artist will integrate digital technology into their creations, empowering them with digital media. As a result, previously singular and fixed forms can instead exhibit various manifestations with the participation of the audience. These interactive art forms -

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<sup>1</sup> 'Public sphere' is the realm between personal space and state institutions. It refers to an open space where citizens can freely exchange opinions. 'Public' refers to the legal protection of this free communication and citizen participation in public affairs.

<sup>2</sup> This conception of 'public' refers to the wealthy and educated middle class, not the general public. In addition, the middle class as patrons greatly influenced the artistic style and competed with the tastes of the palace aristocrats at that time.

with the help of computer control – can employ sensors and capture devices to photograph participants, collect information and, through systematic analysis, combine imagery with audience interaction.

In terms of content, these interactive installations draw attention to their connection with the public, facilitated by digital technology-driven interaction. Among these interactive forms, there are three main types: interaction with the creator, interaction with the artwork itself and interaction with other visitors.[18] The interaction between viewers and the artwork is the most common form, where interaction is not controlled by the artist but by the viewers themselves.

Digital technology, serving as a tool for communication and connection, facilitates the integration of virtual and physical spaces. Therefore, the relationship between the two is not simply additive, but a multiple superposition of people and people, people and things, people and the environment and the transformation of the formation. Consequently, a multiple mixed virtual and real space is constructed, connecting the audience's sense of touch, vision and hearing, thereby giving the viewer multiple spatial feelings.

#### **4 From Natural Material to Technological Constructs: Public Art and Three Spatial Forms**

In 1974, Lefebvre published 'The Production of Space'; during this period, spatial studies aimed to break free from the constraints of linear historical perspectives. Lefebvre corrected the theory of absolute space and introduced a new perspective on urban issues, suggesting that cities are not merely natural phenomena but are shaped through specific modes of production and social activities. However, it is difficult to adopt this perspective on space, which led to the proposal of the theory of spatial production. He argued that 'space is a social product' and based on this viewpoint, introduced the spatial triadic dialectics,<sup>3</sup> which is the antithesis of the old materialist dialectical dualism.

Representations of space and spaces of representation are in opposition, which is superficially embodied in the opposition between scientists and engineers and the inhabitants and users, but in essence, it is the opposition between knowledge and order and art symbolism. These two are also connected through spatial practices. The space of representation and the space of representation also has a dualistic relationship between imagination and reality in the space of practice.

Lefebvre's triadic dialectic is a dialectical movement of affirmation-negation-other, rather than the simplistic positive-negative-synthesis in the Hegelian sense. The triadic dialectics strengthen resistance against complete closure and 'unchanging structures' [5][11]. In his triadic dialectic of space, the three dimensions of epistemology are: conceived, perceived and

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<sup>3</sup> 'Spatial practice' is the social production and reproduction of urban life and daily activities. 'Representations of space' refers to the conceptualised space dominated by the knowledge and ideologies of scientists, planners and social engineers. 'Spaces of representation': the space of inhabitants and users, which is dominated and experienced negatively.

lived [12]. Lefebvre's spatial dialectic corresponds to Husserl's construction of the life-world. The life-world is based on intuitive sensation and authentic imagination, serving as an ontological prerequisite for social concerns to survive.

The three corresponding types of space are perceived space, conceived space and lived space.<sup>4</sup> Building upon these three spatial theories, this article proposes three spatial theories of public art: the space of reproduction, the space of presence and the space of numbers. Through these three dimensions, it seeks to delineate and explore the spatial production of public art.

## 5 Space and Place: The 'Absolute Space' of Reproduction

Among the three spatial concepts proposed by Lefebvre, the first one, the space of perception, also known as real space, represents the physical form of social space, which is the natural space we inhabit. The spatial relationship of natural places is structured around the sky and the earth, with the earth providing an infinite space of extension. Human-made space is constructed based on reason and order, creating enclosed space categorised as either fully enclosed or partially enclosed. Buildings are fully enclosed spaces, while square and open-air venues are examples of partially enclosed spaces. Schultz suggests that 'individuals 'absorb' the environment and buildings become focal points within it.' [3] [17] Places have a clear spatial identity, where the building, by means of the earth, towers up to the firmament and relates to the environment, with the inclusion of human-made objects or things as focal points within this environment. Here place and space are parallel concepts.



**Fig. 1.** Ice Watch, 2014 outside Tate Modern, London – 2018. Photo: Olafur Eliasso.

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<sup>4</sup> A 'perceived space' is a social space with a physical form, such as urban roads, networks, workplaces, etc., which can be quantitatively and accurately measured, depicted and designed with the help of certain instruments and tools. A 'conceived space' is a conceptualised space used by scientists, planners, urbanists and politicians. A 'lived space' is used by artists and philosophers; they are imagined and fictional spaces, symbolic spaces of all kinds.

Schulz argues that place-making needs to be described in terms of landscapes and settlements and analysed in terms of space and characteristics. Space refers to the elements constituting a place, while characteristics are the qualities possessed by the space. Landscapes are categorised into natural and man-made landscapes, with natural landscapes being all kinds of natural terrain. Man-made landscapes are the production, life and social activities of people. The form and content of the main body of art and the surrounding environment are influenced by each other and public art utilises space to disseminate and interact with the public; space serves as a kind of medium, making space no longer a single place but a place for public interaction. For instance, in artist Olafur Eliasson's works such as 'Weather Project' and 'Ice Watch' (Figure. 1), space acts as an interactive medium. When faced with natural phenomena like cascading waterfalls or majestic mountains, individuals may feel oppressed because of the vastness of these spaces.



**Fig. 2.** The weather project, 2003 Tate Modern, London, 2003. Photo: Olafur Eliasson

Furthermore, Eliasson's 'Weather Project' (**Figures 2 and 3**) was exhibited at the Tate Modern and Tate Britain in London. London was known as the 'Smoke City' at the beginning of the 20th century and Eliasson added London's representative fog to his work by placing a large number of fog machines in the exhibition space; under this foggy atmosphere, he constructed a large semi-circular disc using thousands of monochromatic lights and arranged the ceiling above the disc as a mirror, simulating the sun rising. Eliasson's use of artificial technology to move familiar natural scenes into the exhibition space reproduces the original natural space, an artificially constructed nature, which will be a non-permanent natural space that will be framed artistically.

Additionally, this exhibition provides the viewer with an opportunity to examine themselves and to see the sunrise. The participants can see themselves through the reflections of the ceiling, providing the viewer with the possibility of examining the space in which they are located and creating another space within the original space.



**Fig. 3.** The weather project, 2003 Tate Modern, London, 2003. Photo: Olafur Eliasson.

Michel Foucault argues that we are in an age of co-temporality, an age of juxtaposition, an age of distance and proximity, an age where everything is placed side by side, an age of dispersion. [13] This age is characterised by the placement of everything side by side, making spatial issues impossible to discuss in isolation, therefore, the space established by vision is meaningful.

'Weather Project' is a work that integrates vision, space and the body. Bodily perception ensures the visibility of vision, while vision gains spatiality through bodily perception. The viewer is in a space of monochromatic light, participants can only perceive simulated sunlight within their visual range. Through vision, the body perceives itself basking in sunlight, generating a sensation of sunlight shining on the body.

Maurice Merleau-Ponty said ‘The mirror is an extension of my relationship with my body’. [6][14] The mirror allows the viewer to be both the viewer and the viewed, placing the bodily relationship in a visible space. In ‘Weather Project’ the mirror places participating viewers and the reflected semi-circular disc within its reflection, creating a new space within the mirror. This demonstrates an interweaving of vision, space and the body, blurring the distinction between inside and outside the mirror and alienating the space. The use of digital technology can bring about changes in the structure of material space and reproduce different spaces.

## 6 Space and Time: The ‘Historical Space’ of Presence

According to Bergson, the material world is a spatial world and the so-called objective reality of time is merely the abstraction and solidification of our consciousness’s duration by external spatial concepts, which are then projected back onto the external world as a homogeneous medium. He argues that the reason people fail to recognise the extension as the essence lies in their lack of awareness of duration itself and the failure to recognise that extension is a unique form of conscious life, such as memory. The past exists in memory and can still be perceived, although past events no longer exist. Memory constructs experience, which arises after personal experience and belongs to the individual, the essence of experience.



**Fig. 4.** ‘Untitled’ (Ross), 1991. Installed in the home of a private collector in 1992. Photographer: Cal Kowal. Image courtesy of the collector.

Bergson’s idea of duration is not a concept in natural science but a philosophical one. Duration refers to the absolute, ontological characteristics of self-reference and self-consciousness. For example, Felix Gonzalez-Torres’s untitled (Portrait of Ross in LA) (Figure 4.) is an interactive

work that transforms ordinary material candy into an installation that changes and re-emerges when it is exhibited in different places. However, the total weight of the candies remains unchanged, symbolising the healthy weight of his partner, Ross, at 175 pounds. The viewer can choose to physically interact with the work and each viewer can take the candy, which also symbolises Ross's weight loss and the gradual weakening of his life until he disappears altogether.

St. Augustine said, 'The only thing that is eternal is change.' With this in mind, the candies diminish over time during the exhibition, but after closing, Gonzalez replenishes them, as if Ross had always been there, lingering, in Gonzalez's memory. For Gonzalez-Torres, his work is both a tribute to his partner and a silent protest against mainstream society, placing his intimate space as a homosexual in the public eye, which was highly discriminated against at the time. However, this discrimination was an artificial barrier, with the door implying a visual and behavioural crossing and the threshold serving as a watershed, with the threshold creating the so-called inside and outside space. Today's so-called public spaces are also filled with invisible markers that emphasise the solidity of a certain social barrier that keeps the distance between the high-consumption class and the other at the bottom of the social ladder. [7][15] Barriers maintain the homogenisation of both sides, yet there is no significant difference between them as people think.

The spatial form of Gonzalez's works emphasises the presence of time and the historical space brought about by personal subjective experience and through this kind of interactive public art presents a dual space of time-space that transcends material space. Through such interactive public art, a dual space of time-space is presented that transcends material space.

## **7 Space and hyperspace: a theory of the 'space of difference' of numbers**

Digital images and cyberspace constitute the main components of digital public art space. Images, with their sensory immediacy, concrete imagery and information transmission capabilities, far outweigh textual functions. As humanity enters the age of visual literacy, the intervention of virtual reality images in space has become an inevitability of the times. Olivier Grau argues, 'Virtual space is an illusion formed automatically by the combination of hardware and software elements, is a virtual image machine based on various principles of the real world.' [8][16] The structural images that constitute the virtual reality places and spaces of digital public art are constructions of physical space in virtual real-life scenes.

Don Ihde categorises the intentional relationship between humans and the world into four modes: embodiment relations, hermeneutic relations, alterity relations and background



relations.<sup>5</sup> Based on this, Ihde constructs a triple stable state of spatial embodiment, namely, on the screen, through the screen, and in the screen. [2]

The term ‘through the screen’ has hermeneutic significance, emphasising the body’s relationship to space through the perceptual structure of the screen. For example, Andrea Polli’s ‘Particle Fall’ (**Figure 5.**) is a device that senses changes in air quality and responds accordingly, with a stream of blue pixels appearing when the air is pure and red when it is saturated; fewer bright particles over the waterfall correlates with fewer particles in the air. This project showcased, for the first time, a 60-foot-high digitally generated waterfall pouring down the facade of the AT&T building in San Jose, California.



**Fig. 5.** Particle Falls, framework of Connecting Cities In/Visible City 2015. Photo: Andrea Polli.

The quality of air, although imperceptible, has a significant impact on public health. The installation allows air quality to come out of the screen as a pictorial entity, reaching the real space, where the image implies different viewing structures and visual relations and produces the space in which people are located, realistically reflecting the characteristics of the place and space of the virtual reality. It can truly reflect the characteristics of place and space of virtual reality. Images convey a microcosm of the times, with digital technology deeply embedded in modern life and changing at an alarming rate. In this context, mimesis has

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<sup>5</sup> Embodiment relations are the mutual symbiosis of human and technology, where the technology is fully integrated into the perceptual and bodily experience of the human being. Hermeneutic relations are a textual interpretation of technology. Alterity relations refers to technology as the other that is completely distinct from the human being. Background relations are how technology does not occupy the place of people’s visual focus, but is integrated with our lifeworld,

become a new reality, and 'Particle Falls', as a real-time, environmentally-responsive projection, is disseminated in the form of images as a collective behaviour in the composite world of virtual reality.

Additionally, Michel Foucault argues that when various types of digital art blend and mix in urban spaces, and multiple production and social relations are reconfigured under the entry of digital technology, the juxtaposition of a 'heterotopia' mixed space is formed, which not only acts as a part of reality, but also overlaps and mixes social practices and interaction possibilities on the space of reality. The blending of heterogeneous spaces is the embodiment of different types of digital art in space and is a characteristic of digital public art. The intervention of digital technology extends space on multiple levels, creating new virtual spaces on top of existing ones.

## **8 The Aesthetic Value and Development of Public Art in the Digital Age**

Public art has evolved from the early government-led sculpture monuments placed in city squares or parks to the present art as a medium, with activism as the orientation, directly engaging with social issues. The updating of creative themes, spatial carriers and expressive forms has led modern public art in new developmental directions. Public art in the new era embodies the convergence of collective consciousness and individual reflection.

In the digital age, public art revolves around groups, physical boundaries and socio-political-economic contexts. It seeks to connect society and redefine a range of existing issues in society, allowing the public to participate in the creative context of public art more directly in their daily lives.

In this sense, public art is no longer a static artwork that has already been installed but can be seen as an action - a practice that connects the public and expands the space of the work from a phenomenological level. Light and shadow, space, angle, movement and the viewer's perception of their body are integrated into the art creation. The public is transforming from being passive as a viewer to being part of the main body of art creation.

The characteristics of public art become increasingly evident in the digital age, yet most public art still integrates into urban ecology in relatively rudimentary ways and has not organically merged into social spaces. The narrative scope of such storytelling is extremely limited. These public art pieces are temporary but the impact they have on the public and society as a whole during their occurrence and display is permanent, far exceeding the existence of the material itself. Under the intervention of digital media, the continuous overlay of virtual space and real space has produced new social spaces, making modern urban spaces carriers of the integration of real space and digital media.

According to Lefebvre, space is a constructed illusion and serves as a neutral medium of experience and conceptualisation, existing as a relational medium in everyday experience. Therefore, under the influence of digital media, urban spaces are no longer merely places of activity but have become an integrated environment for interaction with the public, constituting a part of the lived space experienced by people. They exist both as a part of

real-life space and as overlays and reconstructions based on real space, further enhancing the interweaving of the virtual and the real.

Most public art in the digital age coexists in real space, virtual space and augmented reality, enriching the dimensions of spatial production while providing audiences with multidimensional experiential processes. The spaces produced by public art in the digital age allow its narrative to expand beyond the confines of original spaces, extending into specific domains. Forming a heterotopian type of public space in the space of multiple extensions and mutual intermingling enables people to experience the public art of the digital era in the form of a heterotopian type of public space. With the help of public art under the influence of digital media, people constantly redefine their identity relations, strengthen their participation in spatial production and gradually shape a new identity for public spaces.

## **9 Conclusion**

In different historical periods, due to variations in the level of social production, artistic media have continuously evolved, leading to changes in artistic forms of expression. As a new type of public art in the digital era, digital media technology has both virtual and real forms, which not only serve as a carrier but also change the space from the level of form construction and the mode of dissemination. The incorporation of digital media reconstructs novel forms of artistic production space. Leveraging public art as a heterotopia for the construction of hyper-space obscures natural reality, giving rise to a representation of what is real. Digital public art in this context is not simply technology for technology's sake. Technology is an addition to art, not the essence of art and the medium is also a form that does not express the purpose of space.

This paper discusses the concepts of digital technology and space together, using space as an introduction to point out a new type of interaction between public space and public art under the intervention of digital technology. The theoretical foundation of the study is based on Henri Lefebvre's three conceptions of space, proposing that digital technology expands the interactivity of public art within these three spatial forms. The intervention of digital technology endows interactive spaces with deeper significance, wherein artistic works are no longer confined to singular spaces but are mixed and interwoven. This necessitates an interdisciplinary approach; thus the article employs changes in public art under the intervention of digital technology as a vehicle to explore deeper spatial changes beyond mere formal considerations. In this sense, it integrates multidimensional discussions spanning art, science and philosophy.

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