

# Innovative Ways of Visual Environmental Art and Sustainable Development in Digital Media Under Deep Learning Model

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## ABSTRACT

The aim of this research is to improve the current level of visual environment art and achieve sustainable development. This work begins with the background of digital media and is grounded in relevant theories of visual environment art and sustainable development. The questionnaire survey method involves investigating 500 random respondents, focusing on their understanding of digital media and preferences for the development of visual environment art. Next, virtual reality technology and a deep learning model are applied as innovative approaches to research visual environment art and sustainable development. Finally, the paper discusses the development trends of the innovative industry in the context of digital media. The results indicate that about 34.4% of the respondents do not know or understand the development of digital media and visual environment art, while only about 9.2% show some familiarity with new technology.

## KEYWORDS

Digital Media, Visual Environment Art, Sustainable Development, Virtual Reality Technology, Deep Learning Model

## INTRODUCTION

Digital media art is in a constant state of change and development, making it difficult to establish a clear definition of it. Concerning the evolution of art itself, digital media art originated from the conceptual art of the 1960s. It was influenced by various art styles, such as avant-garde movements, including futurism, cubism, and Dadaism, as well as media and performing arts that emerged in the 1970s. “Communication,” “cooperation,” and “participation” have become focal points for artists in the process of creating digital media art; they also become crucial elements affecting aesthetic value, meaning, and emotional experience (Herro, 2015). Digital media art significantly differs from “old media” art (such as traditional painting and sculpture). The essence of digital media art is often associated with communication, mass media, digital technology, and virtual networks, encompassing everything from conceptual design to visual arts, performance, and installation (Jordan, 2016). The formation and development of digital media art are primarily driven by various aesthetic trends and artistic concepts, as well as advancements in emerging technologies and new designs.

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Due to the uncertainty and evolution of new media art itself, different scholars around the world have defined the concept of digital media art from different angles. The current concept of digital media art mainly consists of three dimensions. The first is the perspective of time advancement. Many scholars believed that digital media art appeared later than “old media art,” such as painting and sculpture. It was formed in the field of research in contemporary art after the 1960s (Moreno et al., 2015). However, the time-consuming nature of digital media art makes the study of art a mere formality, so few scholars support this view. The second perspective focuses on the development of media technology. Many scholars argue that digital media art's core lies in media technology innovation, with media serving as the primary medium of creative expression and art as its outward manifestation. This view is supported by the Australian Contemporary Art magazine (Correa, 2016). Digital media art is a broad term characterized by the use of advanced technical language in artworks, including virtual art created through computers, the internet, and video technology, as well as image art and multimedia direct assembly and performance (Casemajor et al., 2015). Digital media art is a technicalized form of art, encompassing artistic exploration and practices that employ various scientific and technological means (Church, 2017; Dezuanni, 2015). The third dimension, from the perspective of the evolution of art forms, posits that digital media art represents a new type of art produced through the integration and advancement of science, technology, and artistic form. Phillips (2004) stated that digital media art involved the utilization and exhibition of new technologies associated with digitization and information dissemination, such as computers, cameras, and mobile phones. He emphasized that its main characteristic was interaction, along with participation in cultural, guild, political, and aesthetic activities (Phillips, 2004). Finnemann (2014) noted that the emergence of video, sound, and interactive devices transformed artistic creation. These new styles, differing from traditional media, such as computers and digital imaging technology, are mixed and integrated into digital media art (Finnemann, 2014).

Art theorists largely agreed on the interpretation of digital media art. They viewed “media” as “media” and “new media art” as an artist's attempt to fuse cutting-edge digital technology with avant-garde artistic concepts to explore new artistic spaces and perceptions of the world (Gantz et al., 2014). This definition emphasized the use of new technology as an artistic medium, with its adoption continuously updating its meaning and scope.

In addition, research on the sustainable development of digital media art has gradually attracted attention in recent years. Scholars pointed out that digital media art focused on technological innovation and aesthetic experience while considering resource consumption, environmental impact, and cultural adaptability (Takala, 2023). For example, in applying VR and augmented reality technologies, reducing energy consumption and hardware resource waste while ensuring users' immersive experience has become an important research direction (Wiratno & Callula, 2024). At the same time, sustainable art development also emphasizes the impact on social and cultural levels. For instance, digital media artworks should balance different groups' cultural identities and participation during the communication process to realize the long-term value of art (Abdoh, 2024).

Combining technological innovation with sustainable development, Yan (2025) proposed that the development of digital media art should enhance artistic expressiveness, interactivity, and audience experience while establishing a sustainable creation model. For example, Zhan et al. (2024) optimized visual effects and interactive experience through a deep learning (DL) model, which could reduce human and material costs while enhancing the audience's sense of immersion and participation (Tsai, 2025). In addition, the sustainable development of digital media art is also reflected in its adaptability to diverse cultures and social needs. In other words, against the background of globalization, the compatibility and durability of cultural communication are realized through technical means.

Overall, the development of digital media art presents the integration of three dimensions. The time dimension continuously promotes the modernization of artistic forms; the technical dimension relies on advanced technological means to drive creation and communication; the sustainable development dimension balances resources, environment, and social and cultural factors. In this way, an

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