

Research on the Application and Development of Digital Media Art in Urban Public Space Design

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Abstract: Digital media art is an emerging art form that combines digital technology and media art. It has huge potential to bring innovation to urban public spaces and provide them with vibrant artistic experiences. This article analyzes the design significance and value of digital media art in urban public space, its various forms of application in urban public space design, and the innovative ideas and paths that digital media art can take in urban public space to guide the future. The application and innovative methods of digital media art in urban public space design provide certain theoretical and practical references for urban planners and designers.

Keywords: Urban public space design; Digital media art; Intelligence; Interactive installation

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1. Significance and value of digital media art in urban public space design

1.1. Improving public participation and the identity of the city

Through the innovative application of digital media art, urban public space is no longer limited to the domain of professional designers but has become a creative space for regular residents^[1]. This interactive design increases residents' participation in the city. It creates a sense of belonging and identification with the city, making the city no longer just a static background but a place for joint creation and experience. This sense of participation enables citizens to have a deeper emotional connection with the city, further encouraging their participation in the construction and development of the city^[2].

1.2. Enhancing the urban cultural and artistic atmosphere

Digital media art injects novel cultural elements and artistic atmosphere into the city. Through digital projection and interactive installations, the urban space becomes a stage for art display, integrating art and culture into all aspects of the city. This kind of design not only improves the aesthetics of the city and integrates art and culture into the urban space but also stimulates residents' interest in culture and art, making the city an intersection of culture and art and creating a more colorful urban life^[3].

1.3. Broadening the scope and channels of urban cultural communication

Digital media art provides a new channel for urban cultural communication. Urban culture and spirit are widely disseminated through digital platforms, social media, and other channels. This method of communication not only expands the scope of cultural communication but also accelerates the communication of city image and urban culture, making it easier for residents and tourists to obtain urban cultural information through digital social platforms in urban public spaces, forming a closer cultural interaction net ^[4].

1.4. Making the urban space more interesting

Digital media art injects creativity into urban public spaces, making urban spaces more attractive. Elements such as interactive sculptures and digital projections can also add vitality to the city, providing residents with an interesting and lively urban experience. Interesting features improve the city's quality and attractiveness, forming its unique charm and characteristics ^[5].

2. Innovative application of digital media art in urban public space design

2.1. Interactive urban sculpture

Interactive urban sculpture is an innovative application of digital media art in urban public spaces, which can transform traditional static urban sculptures into interactive and creative digital art installations. Interactive urban sculptures utilize sensor technology and interactive devices to enable the sculptures to react in real time to the viewer's movements, sounds, or touch. Citizens can trigger different effects by touching different areas during the interaction, creating a diverse visual and audio experience. Stone sculptures can also be connected systematically with other facilities in urban public spaces to guide traffic or enhance the spatial atmosphere. Interactive urban sculptures are no longer static works of art but dynamic works created with the audience in mind, significantly enhancing public spaces' entertainment and participation ^[6].

2.2. Digital projection mapping

Digital projection mapping technology uses projection technology to display works of art, stories, or interactive images on the surface of buildings to create colorful artistic effects. It transforms urban buildings into huge artistic canvases, changing the appearance of urban buildings and bringing novel visual experiences to public spaces. Meanwhile, digital projection mapping can convey the city's cultural, historical, and social information, creating unique artistic expressions for urban spaces.

2.3. Wall interactive device

Wall interactive installations are innovative ways of integrating digital media art into urban public spaces. Large touch screens or sensors are installed on the city walls, making the wall into an interactive object. In the past, traditional urban walls were often monotonous. Still, interactive wall installations can provide a new urban experience for urban public spaces, making the walls come alive and allowing citizens to create digital art in urban spaces, thus enhancing the sociability and vitality of urban spaces ^[7].

2.4. Virtual reality city roaming

Virtual reality city roaming combines virtual reality (VR) and augmented reality (AR), allowing residents and tourists to roam in the virtual city through VR equipment, creating a new garden experience for the city. Residents can enter the virtual city by using VR equipment or smartphone apps, where they can enjoy virtual city landscapes, interact with virtual artworks, and participate in VR games. Simultaneously, virtual reality

city roaming, leveraging AR technology, enables users to view virtual landscapes and artworks overlaid onto real scenes. This integration permits virtual items to interact with real ones, offering virtual restoration and reproduction of historical buildings, cultural sites, or ancient cities and towns. Visitors can thereby traverse time and space, experiencing the allure of history while transcending physical constraints. This novel approach to exploring cities not only enhances communication channels for urban culture but also presents innovative avenues for urban tourism and education.

3.5. Interactive ground projection

Interactive ground projection refers to the use of ground projection technology to interact with pedestrians through interactive images in urban public spaces or road passages. It can turn a city square or pedestrian walkway into a huge interactive screen, presenting patterns, images, and animations of various art forms on the road, dynamically interacting with pedestrians. Effects, playing games, or participating in collective art creations enhance the liveliness and sociability of public spaces ^[8].

2.6. Intelligent urban furniture

Using smart furniture in urban public areas, such as benches or tables with interactive screens, can provide residents with a platform that integrates rest, social interaction, and information acquisition. Embedding interactive screens, smart sensors, and other technologies makes common urban furniture such as chairs and tables multifunctional. Residents can easily access city navigation, real-time traffic, city service information, etc., on this furniture, making public space a place for rest and a hub for information exchange. This improves the practicality of the public space. Secondly, interactive furniture promotes social interaction. Interactive screens on smart benches or tables provide a platform for collective participation, where people can share information, learn about community events, and even meet new people. This helps overcome the issue of loneliness among citizens and creates closer community connections.

3. Development approaches for digital media art in urban public spaces

3.1. More intelligent interactive experience

Diversified and intelligent interactive experience is a cutting-edge development direction of digital media art in urban public space design, which focuses on using artificial intelligence to provide a more personalized and intelligent interactive experience for urban public space ^[9]. This trend deeply integrates digital media art and smart technology to create more intelligent and immersive artistic interactions for citizens. By integrating artificial intelligence, digital media devices in public spaces can better cater to the needs of the citizens and create personalized interactive experiences. For example, through face recognition and emotion analysis, real-time adjustments to the interactive environment can be achieved. Besides, artificial intelligence algorithms can be used to present art displays based on the user's preferences, interests, and historical interaction records. Furthermore, users can interact with digital media art in urban public spaces through mobile applications, social media, or other digital devices to achieve seamless connections between different platforms.

3.2. Sustainable digital media design

The concept of sustainable development highlights the balance between environmental, social, and economic aspects, and digital media design will become a new way to achieve sustainable development in future urban public spaces. Integrating renewable energy is a key component in sustainable digital media design. Digital media devices can use renewable energy sources such as solar or wind energy to reduce dependence on traditional energy sources. This approach helps reduce the carbon footprint and provides cities with a more

environmentally friendly and sustainable energy solution. Sustainable digital media design can also enhance the renewability and adjustability of digital media works. Using modular design and remote upgrade technology, digital media installations can be flexibly adjusted and updated according to urban development needs. This helps reduce the disposal of outdated equipment, extends the life of digital media works, and reduces the overall environmental impact of digital media design. In addition, digital media can guide citizens in understanding sustainable development through interaction and participation. This interactive method of social participation helps to spread the concept of sustainable development, improve citizens' environmental awareness, and promote sustainable development.

3.3. A more comprehensive mechanism for the protection and inheritance of cultural relics

The historical and cultural heritage protection mechanism of digital media art in urban public space design provides a new way to represent and protect ancient cultural heritage through innovative technical means. Digital media art can restore and reconstruct ancient buildings and cultural relics in a virtual environment through advanced digital technology and high-precision data collection technology, providing a richer form of preservation for the original cultural relics^[10]. Interactive learning and participation mechanisms can also be introduced to make historical and cultural relics more vivid and interesting. Through the guidance of digital media, tourists and citizens can have a deeper understanding of the historical background and cultural connotation of cultural relics and even participate in virtual historical scenes. This interactive learning method can stimulate the public's interest in history and culture and enhance their awareness of the importance of protecting cultural relics.

4. Conclusion

As an emerging form of artistic expression, digital media art holds significant potential for innovation and value in the design of urban public spaces. In the digital era, the design of urban public spaces must align with contemporary trends by integrating more creativity and applications of digital media art. This integration will garner greater attention and utilization of digital media art in urban public spaces, ultimately contributing to the creation of smarter, more artistic, and more livable urban environments for people.

Disclosure statement

The author declares no conflict of interest.

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