

The Diversified Expressions of Urban Public Art Empowered by AI Imaging Technology

Xian Wang

School of Photography, Communication University of China Nanjing, Nanjing 21000, Jiangsu, China

ABSTRACT

Urban public art is an important part of urban cultural landscape, and carries multiple functions such as shaping city images, stimulating public thinking and promoting social communication. However, at present, there are some limitations in the creative media, interactive ways, communication channels and other aspects of public art, so that public art cannot fully meet the increasingly diversified urban cultural needs and public aesthetic expectations. At this time, the deep integration between artificial intelligence and imaging technology brings unprecedented opportunities for the innovative development of urban public art. With the powerful abilities of data analysis, intelligent generation and interaction, AI imaging technology can break through the boundaries of traditional art, expand the creative dimension of public art, and endow urban public art with more diversified expressions. This paper will deeply explore the diversified expression forms of AI imaging technology in urban public art, and discuss the potential and challenges of applying AI image technology to the development of urban public art in detail, aiming to provide new perspectives and ideas for the city to build a more dynamic, innovative and humanistic urban public art ecology.

KEYWORDS

AI imaging; urban public art; multiple expressions

With the rapid development of science and technology, AI imaging technology has been gradually used in the creation and expression of urban public art, which provides a new possibility for the diversified development of urban public art. In the past, urban public art mainly consisted of traditional sculpture, murals or installation pieces. The application of AI imaging technology makes digital image, interactive art and immersive experience gradually become important parts of urban cultural landscape. On this premise, public art is no longer limited to static visual presentation, but generates dynamic images using AI, and makes real-time adjustment according to the environment, time or audience behavior to enhance the interactivity and immersion of art space. At the same time, AI imaging technology promotes a breakthrough in the public art style. Public art designers can use deep learning and computer vision technologies to integrate different cultural and historical elements to create urban public art works beyond the visual expressions limited by traditional media. These works can adapt more to different building structures and public places, further expand the expression of art in the city, and make the interaction relationship between art and urban life closer.

1 The Diversified Expressions of Urban Public Art Empowered by AI Imaging Technology

1.1 Urban Screen Art

The rapid development of AI technology makes urban screen art have new expressions and interactive experience. AI imaging technology increases the complexity of visual presentation and expands the interactive boundary of public art. The introduction of AI algorithm enriches the data-driven visual expression. In the past, the urban screen art was mainly presented by preset content. This issue is solved by AI technology. This technology can analyze environmental data, social media trends or viewer emotions in real time to dynamically generate images. For example, in the city screen project of data visualization, AI can analyze air quality, traffic flow or population distribution through a large number of data streams, and then present the results on the screen in an artistic form, so that the public can perceive the pulse of city operation while enjoying screen art. Therefore, the social function of screen art can be enhanced, and the urban information media function of urban screen can be strengthened. At the same time, AI can enhance the interactivity of screen art. The AI-driven interactive system can identify audience behaviors, expressions and individual preferences to make corresponding visual feedback, and analyze pedestrian behaviors through computer vision technology to generate unique image responses on the screen in real time, and make each audience experience personalized art communication. At this time, urban screen art is no longer a one-way information transmission, but “becomes” a responsive urban interface, which enhances the immersion and interactive experience of public space^[1]. In addition, deep learning and generative AI, such as GANs and diffusion model, are also promoting creative breakthroughs in screen art. With the help of AI, the screen can automatically generate and optimize image content. For example, the naked-eye 3D screens at the Place in Beijing or the Taikoo Li in Chengdu often continuously update dynamic visual content through using AI

technology and increasing labor costs. The screens in these two cities have gradually become urban “landmarks” and attract people to visit, and the urban landscape has become more changeable and dynamic^[2].

1.2 Urban Interactive Art

The continuous development of AI imaging technology provides a new possibility for interactive art in urban public space. For example, Guo Xi's “A Film Endless”, a installation, transforms the natural scenes along the bank of the Huangpu River into images with the physical framing frame. At the same time, the random generation of captions leads the audience to have an immersive experience similar to film narration while watching the river view. The achievement of this art form is a typical case of AI imaging technology empowering the interaction in urban public space. In general, in public art installations, images are preset or static, and the application of AI makes the image presentation more intelligent and dynamic. The caption system of “A Film Endless” is not arranged in advance, but generates text based on the principle of randomness. It makes the same river view show a unique narrativity in the eyes of different audiences at different times, enhances the interaction between the art of public space and the audience, and enables the audience's individual experience to be connected with the image content, thus forming a richer perceptual experience^[3]. In addition, AI imaging technology can help public art break through the limitations of physical media to achieve a wider range of intelligent interaction. In the “A Film Endless”, the AI algorithm can adjust the content of caption according to the weather, time, ambient light and other factors, further realize highly personalized urban image interaction according to the audience's behavior data, transform the urban public space from a passive display field to a dynamic dialogue platform to truly integrate art into daily life.

1.3 Urban Immersion Art

AI imaging technology is gradually becoming an important driving force for urban public art, which opens up new possibilities for the immersive expression of public art space. At the Guangzhou International Lights Festival in 2024, the deep integration of AI and light image art builds a futuristic urban landscape, and redefines the expression of public art through the interaction between light and shadow.

AI enhances the visual impact of lighting works, and through intelligent computing and real-time generation technology, make the light and shadow installation be dynamically adjusted according to the environment and audience interaction feedback, so as to enhance the immersive and personalized viewing experience. During the performance in the Haixinsha Asian Games Theme Park at the Lights Festival, “Our Future” takes AIGC technology as the core, and combines with visual art, dynamic light and shadow and interactive performance, so that technology and art complement each other, and the public can feel the beauty of light and shadow and intuitively experience the infinite possibilities of AI to shape the future life. The lighting and video installation of “AI-CITY” uses computer vision and projection technology to visualize the living scene of the future city, and allows visitors to shuttle in the space of light and shadow, and feel the intelligent life driven by AI.

In addition to the static lighting art, the Lights Festival also integrates interactive installations that combine virtual and reality, such as the dynamic presentation of the “cyber mascot” and the immersive light and shadow experience space, which surrounds the audience in the image world to explore the clothing, food, housing, transportation and other aspects of the future city, and expands the expression dimension of public art^[4]. In addition, the 360° light show in the Canton Tower is another masterpiece of urban public art empowered by AI imaging technology. The core work “Melting Light” relies on computer precision control technology to achieve all-round rotation and dynamic transformation, and create a “infinite” space, thus enriching the gradations of light and shadow. The application of new metal mesh materials enables the lighting work to present diversified visual effects in different angles. During the day, the lighting work is a public art installation, and at night, it is transformed into a flowing light and shadow painting. Its multiple forms of expression further expand the artistic expression of urban space.

2 The Challenges and Reflections Brought by AI Imaging Technology Empowering Urban Public Art

2.1 Technology Ethics and Information Security Issues

The application of AI imaging technology in urban public art has added creative visual expression to urban space, but triggered a series of challenges in the aspects of technology ethics and security, among which data privacy and portraiture right have become unavoidable issues. As is known to all, AI image creation comes from huge data sets. These data are highly likely to contain images of people in public space, which, once unauthorized, will violate people's personal privacy and portraiture right. Meanwhile, AI-generated images sometimes involve specific cultural or historical symbols, which will cause ethical controversy without careful consideration. In addition^[5], the wide application of AI-

generated virtual images in urban space will blur the boundary between reality and virtual. In the field of public art, AI-generated images can change dynamically, which makes art works more interactive and vivid. However, if this technology is used to maliciously modify historical images and fabricate public events, the social trust system will be impacted, the public cannot judge the authenticity of information when receiving it, and the concern of public information security will be aroused. More importantly, the process of AI image generation usually involves complex neural network models. If the public art creation is completely dependent on AI, and there is a lack of clear supervision and responsibility division, then when there is bias or controversy in art works, responsibility attribution will become complicated. It is thus clear that establishing a transparent and auditable AI art creation mechanism to ensure that the algorithm complies with ethical standards is a problem that must be solved in the currently AI empowering urban public art.

2.2 The Balance Point between Art and Technology

In the creative process of urban public art, finding a balance between technological innovation and artistic expression is a very challenging task. On the one hand, the highly automated AI imaging technology will greatly weaken the subjectivity of space design artists. With the help of AI technology, people can generate a large number of images in a short time and constantly optimize the styles based on data training. However, the creative logic is always based on statistical patterns rather than people's emotional experience and values. Therefore, the spatial art works designed in this way will lack personalized expression and emotional depth, and the public art will tend to be stereotypical and lack unique urban cultural temperament. On the other hand, the rapid iteration of AI imaging technology may also cause art works to fall into the dilemma of "rapid update". This is because AI imaging technology will constantly update algorithm and display technology, and the development speed of technology is much faster than that of traditional art media, which may make public art works combined with AI imaging technology appear outdated due to technological aging after several years, and even be inoperable due to the upgrading of hardware and software. The instability of the life cycle of AI imaging technology makes the retention time of space art works be greatly reduced, and the relevant departments need to continue to invest resources for maintenance and upgrading, otherwise the works will lose artistic value in a short period of time, and all previous efforts will be in vain.

2.3 Maintenance and Management Costs

Although the application of AI image technology has changed the creation methods of urban public art, it puts forward new requirements for the maintenance and management of works. Different from the relatively stable art forms of sculptures and murals, AI imaging art is dynamic, interactive and dependent on technical support, which is less stable than traditional public art forms. And the equipment and software that AI imaging technology relies on is usually high-performance computing equipment, sensors, display screens and other technical facilities, which have high costs in the long-term operation, so that the maintenance costs and management difficulties of public art works with AI imaging technology will significantly increase. For example, LED screens and projection devices need to be replaced regularly, the server supporting AI imaging technology needs to maintain stable operation, and the software system supporting the image needs to be constantly updated. These maintenance work needs to be supported by professional and technical personnel.

At the same time, the space art works created by AI imaging technology operate in a complex environment and will be affected by a variety of external factors. For example, outdoor public art works need to face the challenges of natural environment such as weather and light. Strong light exposure will affect the visibility of images, rain and dust will cause damage to AI imaging equipment, and the achievement of the real-time data input of AI imaging works and adjustment according to changes in the flow of people requires the stable network environment and background computing. Once the network connection is interrupted or the data processing problem occurs, the works may not work properly, thus affecting the public experience. The solution of this series of problems will increase the management cost.

3 Conclusion

In short, urban public art empowered by AI imaging technology brings innovative visual experience and creative expression of urban space, but this process is accompanied by ethical security risks, coordination problems between art and technology, and high maintenance and management costs. In order to give full play to the potential of AI imaging technology and avoid potential risks, urban management groups, artists and technology developers need to adhere to their own responsibilities when applying the technology, maintain the independence of artistic creation, and establish an effective maintenance and management mechanism. Only in this way can AI imaging art achieve true sustainable development in urban public space and become a unique "wind vane" of urban culture.

About the Author

Xian Wang, Master, Lecturer, Research Fields: Photography, Cross-media Research.

References

- [1] Cheng Xuesong, Xu Zhuangzhuang, Luo Xiang. Art Curates for the City: Concepts and Strategies of Urban Planning Exhibition from the Perspective of Public Art [J]. Urban Development Studies, 2020,27(09):35-40.
- [2] Zhao Zhihong. The Spatial Turn and Field Construction of Art: From the Perspective of Urban Public Art Landscape [J]. Hundred Schools in Arts, 2019,35(05):30-37.
- [3] Hong Rongman. Study on the Site-specificity and Cross-media Trend of Public Art: A Case Study of the "Mobile Art Museum" Project [J]. Art Journal, 2018(04):102-106.
- [4] Wang Yuchen. Research on the Application of Public Art from the Perspective of Digital Media [J]. West Leather, 2021,43(05):126-127.
- [5] Zhang Zhongtao. The Art Risk in a Digital Times: Public Art vs. Big Data Capitalism. Public Art, 2020(03): 24-29.