

# Opportunities and challenges: AIGC empowers the protection and inheritance of traditional culture

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## Abstract

**Generative AI, represented by ChatGPT, has shown great potential in traditional cultural creation and dissemination due to its automation, diversification, and intelligent generation characteristics. With its empowerment, traditional cultural protection and inheritance will face opportunities and challenges. On the one hand, AIGC significantly improves the efficiency of content generation work, providing more possibilities for content generation; On the other hand, AIGC still faces urgent issues in terms of technology, responsibility allocation, ethics, and other aspects. Breaking through the bottleneck in the dissemination of traditional culture requires integrating into the AIGC wave, seizing opportunities, facing challenges, and further exploring new paths for the protection and inheritance of traditional culture under the empowerment of AIGC, to assist in the content creation and value dissemination of traditional culture.**

## Keywords

**Art design ; AIGC; Enable ; Traditional culture.**

## 1. Introduction

Traditional culture is the foundation for the inheritance and development of a country and a nation, and if it is lost, the spiritual lifeblood will be cut off. [1] The medium of transmission of traditional culture has gone through many innovations, including the spoken language, the written word, the printed medium and the electronic medium. In the stage of oral communication, limited by the type of language and the problem of not being able to preserve it, the communication can only rely on the memory of the human brain, which limits the horizontal and vertical transmission of culture; in the stage of written communication, human beings have stone walls, bamboo slips, paper, and other media that can record and preserve the cultural content, but its inability to reproduce determines that culture can not be spread on a large scale; in the stage of printed media communication, due to its reproducible characteristics, it allows the In the stage of printing media communication, due to its reproducibility, the scope of cultural dissemination is enlarged, but on the other hand, the power of words is pale compared with the communication media combining sound and picture; in the stage of electronic media communication, the media are diversified, and the form and content of their works are constantly innovated, but it is only limited to the visual level, and it is difficult to extend to a deeper level of dissemination. Therefore, the protection and inheritance of traditional culture need to be empowered by new intelligence and new technology. AIGC has fundamentally changed the production mode of content generation and has been widely used in the fields of image, text, video, audio, etc. It has injected new vitality into the protection and inheritance of traditional culture through the use of generative algorithms, pre-training models,

and multimodal technology, and created a new opportunity for the digital transformation of traditional culture in the new era.

## 2. Basic Principles and Techniques of AIGC

AIGC (Artificial intelligence Generated Content), i.e. Artificial Intelligence Generated Content, which generates the required content and completes the command task through the deep learning of data, and then through the continuous training of large models. This technological breakthrough is to lead a new round of scientific and technological revolution and the important driving force of the industrial revolution, it is different from the traditional AI learning and analysis of existing data in a fixed mode, it is in the depth of learning and analysis of existing data on the basis of the new data will innovate to generate new content, this technology in the field of images, text, video, audio and other fields are widely used. Take ChatGPT, which is bursting out of the circle, for example, it has gained 100 million monthly active users in only two months after its release, which is enough to show the huge prospect and potential of this technology of AIGC.

Early AIGC is mainly used to assist in generating fixed template content, mostly used in professional task scenarios, such as film, television, entertainment, modelling and so on. [2] The development of generative algorithms, pre-training models and multimodal technology has given AIGC great technical support, in 2014 Ian Goodfellow et al. proposed (Generative Adversarial Networks, GAN), i.e., Generative Adversarial Networks, which consists of two parts, the generator and the discriminator, and through the deep learning and data Through deep learning and training of the data and the analysis of the discriminator, the generator can continuously generate content that meets the meaning of the keywords; in 2021, Radford proposed the algorithm CLIP (Contrastive Language-Image Pre-Training), which can realise the multi-modal pre-training; in 2022, Ho used the forward diffusion process and the inverse generation process to realise a diffusion model (Diffusion Model) for the generation of graphs and texts. Diffusion Model (Diffusion Model) Diffusion Model, which reduces the difficulty of data processing through a new mathematical paradigm, simplifies the training process by requiring only the training of generators compared to GAN, which requires the training of generators and discriminators. Through the iterative updating of technology, AIGC will be more widely used in cultural communication and artistic creation.

## 3. AIGC empowers digital transformation of traditional culture

### 3.1. Technological innovation: new ways of generating content

Levinson once mentioned that media evolution is a kind of self-regulation and self-organisation within the system, and its mechanism is "remedial media", i.e. the later media have a remedial effect on the first media, and the contemporary media have a remedial effect on the traditional media.[3] Computer media not only inherit the communication advantages of the past media, but also have unique communication advantages. [3] The computer medium not only inherits the communication advantages of the past media, but also has unique communication advantages.

In terms of data collection, whether it is recorded in books or photographic technology, it is inevitable that it will be affected by time, environmental changes and other irresistible factors, resulting in data that is difficult to be preserved for a long time and the collection of low quality, with the development of big data and artificial intelligence and other computer technologies, the collection of data for digital recording and preservation, which in turn assisted in the protection and innovation of traditional culture; in terms of data innovation and content generation, AIGC technology assisted in the generation of traditional culture, which in turn

assisted the protection of traditional culture. AIGC technology assists in the generation of traditional cultural data, Liu Miao [4] and others imported the collected traditional cultural data of Ruichang bamboo weaving into the model system, and used DCGAN technology for training, so as to derive new cultural data, and establish the Ruichang Bamboo Weaving Cultural Element Library; in the generation of works, on the one hand, the traditional cultural data will automatically generate the user's required content after collection and training, which simplifies the user's creation process; on the other hand, the multimodal technology will automatically generate the user's required content after collection and training, which simplifies the user's creation process. On the other hand, the multimodal technology provides technical support for data fusion in different domains and realises style migration between domains. Dong Sun [5] and others used the style migration technology in animation design to migrate elements from Van Gogh's *Starry Night* to the film, which provided a new creative idea for animation design.

### **3.2. Sinking Subjects: Decentred Cultural Creation for All**

The mobile Internet era itself is a decentralised era. With the popularity of mobile terminals and the development of intelligent technology, the short video medium came into being, everyone is a media, can shoot content and publish it to the platform through mobile phones, i.e., the UGC in the Web1.0 era; with the improvement of aesthetics and the drive of traffic realisation, the creation of short videos continues to be professionalised, and professional MCN organisations and short video creators are stationed on the platform, i.e., the PGC in the Web2.0 era; entering the Web3.0 era, the new technology represented by AIGC has intensified the degree of decentralisation, no matter whether it is professional or non-professional users. PGC; into the Web3.0 era, the new technology represented by AIGC has intensified the degree of decentralisation, so that users, whether professional or non-professional, can automatically generate the required content through the description of keywords, realising the digital production of traditional culture for all people to co-create and participate.

As Benjamin said, "The more consumers the apparatus enables to take part in the production, and the more quickly it can turn readers and viewers into co-actors, the better the apparatus will be." [6] AIGC empowers cultural production and creation, reduces the difficulty and threshold of cultural creation, and with the technical support of generative algorithms and pre-trained models, it can ensure high-quality generated content. As for professional creators, AIGC provides massive templates for text, video editing, etc., which greatly improves the efficiency of professional production. Artificial intelligence and human beings together constitute a network of actors in the field of cultural production, and they both influence and depend on each other, as well as recognise and act on each other, presenting a symbiotic relationship with each other as subjects. [7] In May 2023, at the West Lake AIGC Cultural Forum, the New West Lake Prosperity Panorama created by individual artist Bai Xiaosu was formally unveiled, a 100-metre scroll encompassing more than 5,000 buildings, 82 square kilometres of vision, and a panoramic view of the triumphs of the West Lake, which has brought a great deal of visual shock, and Bai Xiaosu consulted a large amount of relevant information and travelled to the West Lake several times to carry out fieldwork, and put all the data was handed over to Boundless AI, and through the training of large models, the paintings with Bai Xiaosu's style were finally generated. Boundless AI has created a set of mapping templates for the style of "Prosperity Map" through the IP-based creation of the map. Citizens and tourists coming to the West Lake can combine their own ideas to create their own "New West Lake Prosperity Panorama" in the Boundless AI, experiencing a different kind of city carding.

### **3.3. Efficiency gains: human-machine collaboration for improved productivity**

Early AIGC is mainly used to assist in generating fixed templates of content, mostly used in professional task scenarios, such as film, television, entertainment, modelling, etc. It is a human-

led, fixed and weak AI technology, where the machine can only perform its work in accordance with the code set by the human being, which restricts the imagination of creativity, and is unable to innovate and expand the content. AIGC can automatically generate content according to keywords and styles given by the user through deep learning, with the support of generative algorithms, pre-training models, and multi-modal technology. With the support of generation algorithms, pre-training models and multimodal technologies, AIGC can automatically generate content based on the keywords and styles given by users through deep learning, and the content generated is not only pre-designed by users, but also created through the joint design of users and AIGC. diffusion and other tools. To complete the IP creation of the product, Liang Shuguang not only draws the plane but also needs to carry out 3D modelling and the creation of comics, through MJ and SD to optimize the manuscript and complete the subsequent cartooning, originally a week to complete the drawing of the story of the comics, which can be completed in one day nowadays. On the one hand, human-machine collaboration "unties" the creativity of the human brain and machine, liberating the imagination, and on the other hand, one-click generation greatly improves the efficiency of the creation of works, reduces the waste of time and resources, and allows the creator to put more energy into the data learning and conception in the early stage.

## **4. Challenges posed by AIGC's empowerment of traditional culture**

### **4.1. Technical aspects**

Although AIGC has achieved certain results in many fields, it is still in the early stage of development and the technology is still immature, which is reflected in the following two aspects:

First, the core technology is difficult to break through resulting in a lack of meaning in the generated content, the current stage of the AIGC can be very good at completing the creation of works at the technical level, such as natural language text to generate images or videos, 2D images to 3D models and other creations, but in order to truly achieve consistency with the ideas of the human brain, the AI also needs to have a basic awareness of the conditions of emotion, especially in the details of the work and the deeper meaning of the treatment. Especially in the details of the work and the deep meaning of the processing, AIGC is difficult to understand the real intention of human beings, and can only stay in the surface meaning of the key words. In other words, the creation of AIGC can only be a superficial work but far from the requirement of artwork.

Secondly, the content generation of AIGC relies on the learning of data sets, and the amount of data, authenticity and other factors determine that the quality of the generated content is difficult to control, and the authenticity is also difficult to distinguish. Secondly, the protection and inheritance of traditional culture itself still has certain problems, if the traditional culture itself lacks data and information, then AIGC can not carry out deep learning and training. For example, the Yao people in Guangxi not only lack of national text, but also their language is extremely obscure and difficult to understand, no text and notes, the learning of the Yao language can only be through memory, even in the Yao village to learn the language will take five or six years, the learning of the language is still the case, so the inheritance of Yao songs and other cultural heritage is even more difficult, and it is difficult to disseminate the traditional culture and difficult to digitise it through the AIGC. If the data is collected from open-source websites, then the authenticity of the data needs to be screened by a large number of human beings, otherwise false information will be generated during the training process. According to the results of the experiment conducted by News Guard, a credibility assessment agency in the United States, 80% of the content of the test by ChatGPT gave misleading or even incorrect

answers, and some of the content was contrary to the public order and morality. This poses an uncontrollable risk for youth protection and other areas where accuracy is critical.

#### 4.2. Liability and Copyright Dimensions

AIGC is the result of human-computer collaboration, and since the quality and authenticity of its content is difficult to control, then it is necessary to clarify the division of copyright and responsibility to facilitate the later recovery work. However, AIGC's algorithm is opaque and non-interpretable, coupled with the adulteration of false data, its generated content will be beyond the control of human beings, so the technical theories of mixed responsibility and distributed responsibility are difficult to work in the field of AIGC, and the delineation of responsibility is extremely unclear. AIGC does not have a "body", and thus has no accountability, and cannot be responsible. AIGC does not have a "body" and is not accountable, so the responsibility is borne by its designers and users. In the Interim Measures for the Administration of Generative Artificial Intelligence Services, the expression of "responsibility" mainly focuses on the "provider" of generative AI, and does not involve the generative AI itself. AI itself. [8] However, due to the source of the data, the authenticity of the data, and the difficulty of controlling the "illusion" phenomenon of AIGC itself, it is difficult to clearly delineate the responsibility of the designer and the user.

Secondly, there is also a problem in the copyright of the work, AIGC does not yet have the conditions to become a creative subject, and its work is the result of re-creation based on the learning and training of the existing data, and its content generation does not have originality, so it is necessary for the relevant authorities to screen whether it is reasonable to obtain the copyright of the data set. In the process of traditional cultural inheritance, the inheritor and the content of inheritance need to have a clear record of inheritance, for example, in the inheritance of the northern Shaanxi folk songs in Suide County, there is a clear master and apprentice inheritance relationship between the national, provincial, municipal, and county inheritors to complete the inheritance of the folk songs through the inheritance of skills and assessment. If AIGC fails to clarify the responsibility of content generation and copyright ownership, it will destroy the existing inheritance model and lead to disputes between inheritors and technology users, which is not conducive to the protection and inheritance of traditional culture.

#### 4.3. Ethical and Regulatory Dimensions

At present, China mainly stays at the level of information security derived from algorithmic governance, favouring the regulation of service applications and insufficient underlying technology governance; favouring the regulation of service providers and the regulation of technology providers is not yet sufficient; the data and scenarios classification standards are complicated but have not formed an organic system. It is difficult to carry out the work of pursuing responsibility and protecting privacy and security,[9] which increases the techno-ethical risk and social-ethical risk of AIGC.

In terms of the technical embedding of AIGC, on the one hand, it is affected by the cognition and personal preference of the designers and users, and there will be cognitive and value bias in the process of training and generating algorithms, and on the other hand, there is opacity and non-interpretable in the operation of the algorithms, and the intrinsic drawbacks of the algorithmic technology of AIGC will be hidden to the extent that none of the designers will be able to control the generation of the content of the AIGC. In terms of social ethics, since most of the models are designed by Western scholars, the spirit and flavour of Eastern aesthetics will be lacking in the content generation of traditional culture, which is prone to stereotypes and prejudices. In the process of information collection, even with anonymisation, it is difficult to guarantee the user's privacy and security. As the machine analyses the data during the learning process and combines and correlates the fragmented data, the user's privacy may be recovered, thus resulting in privacy leakage.

## 5. Methods and Strategies of AIGC to Enable Traditional Culture Preservation and Inheritance

### 5.1. Improving core technologies Promoting the deep integration of technology and cultural empowerment

AIGC technology provides a new path of digital transformation for traditional culture, but at present, AIGC can't have human consciousness and can't think in depth, and the output of its content can only be superficial, which requires traditional cultural empowerment to provide value guidance for the technology, and injects higher and deeper meanings into the works.

On the technical level, the type of pre-training model should be clarified, and the large model should be used prudently to activate the corresponding expert model in different fields and application scenarios. Secondly, under the guidance of traditional cultural values, machine learning can be enhanced through human feedback to generate cultural works with positive meanings. For the collection of data and the screening of true and false information, on the one hand, machine initial screening and manual verification are carried out to remove the negative data from the root; on the other hand, more sensitive filtering models are developed to analyse and screen the relevant words and phrases, to clean up the negative data and increase the positive data, so as to generate positive content in the course of continuous training. In addition to this, it is also possible to reduce the model's dependence on data and achieve small-sample learning.

The traditional cultural treasure trove contains huge data resources, from which AIGC extracts excellent traditional culture, transforms it into a cultural gene data set and carries out in-depth learning and analysis, generates high-quality cultural works on the basis of technological breakthroughs in the pre-training model, and achieves the deep fusion of technology and culture to promote the digital transformation of traditional culture.

### 5.2. Clear division of responsibilities Shaping a responsible AI ecosystem

In terms of responsibility, on the one hand, the designers of large models need to maintain a value-neutral attitude, without discrimination and prejudice in terms of country, region and industry; on the other hand, the users of the models need to improve their own ethical qualities, aesthetic awareness and artificial intelligence literacy, and commit themselves to creating positive cultural works. In addition to the designers and users themselves, the government also needs to introduce relevant laws and regulations on the division of responsibility and copyright; platforms and enterprises in the commercialisation of products while taking into account the social responsibility of the generation of content to do a good job of supervision and gatekeeping.

In terms of copyright protection, digital watermarking is one of the effective methods to verify and track the source and ownership of data, and realise copyright protection. Embedding copyright information into the content, digital watermarking technology will not affect the work itself and the watermark information will not disappear no matter how the work is disseminated.

The mobile Internet era is a fast-paced era, new technologies, new intelligence, and new media have broken ground and grown like bamboo shoots, and AIGC has triggered a revolution in content productivity in all fields, and this key technology requires people to establish a reasonable and prudent governance framework, shape a responsible AI ecosystem, and create a collaborative creative environment between humans and machines to realise a green cycle of cultural dissemination.

### 5.3. Establishment of industry guidelines to regulate the creation and dissemination of AIGC

The formulation of industry guidelines and laws and regulations is the prerequisite and guarantee for the healthy development of AIGC. In terms of copyright liability, a balance between copyright protection and restrictions on AI-generated content can be sought by defining the scope of the object of rights, adjusting the duration of copyright protection, and attaching mandatory attribution obligations. [10] In terms of privacy security and data protection, China has successively put forward the "China's Position Paper on Strengthening the Ethical Governance of Artificial Intelligence", "Provisions on the Administration of Deep Synthesis of Internet Information Services" and "Interim Measures for the Administration of Generative Artificial Intelligence Services", which set up barriers at each level of the generation algorithms and the training process, effectively preventing the emergence of the concept of value bias and discrimination, and can also learn from the EU's data protection model and the US's algorithmic liability model. On this basis, it is also possible to establish a data security mechanism and a mechanism for pursuing responsibility by drawing on the data protection model of the European Union and the algorithmic responsibility model of the United States.

## 6. Concluding remarks

AIGC represents an innovation in the way of content generation in the new era, and has the revolutionary energy to promote the productivity of content in all fields, providing a new creative path for traditional culture in a difficult development situation. However, AIGC is still in the early stage of development, and there are problems such as technical immaturity, difficulty in delineating responsibilities, and technical ethics. Therefore, it is necessary to carry out data collection and model training under the correct guidance of values through the in-depth integration of technology and culture and the establishment of relevant supervision mechanisms, so as to ultimately generate positive cultural works, promote the digital transformation of traditional culture, and assist in the protection and inheritance of traditional culture.

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