

Application of AIGC technology in intangible cultural heritage vocal music from the perspective of cross-cultural communication

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ABSTRACT

As globalization advances, intangible cultural heritage vocal music faces the challenge of cross-cultural communication. AIGC technology, as an application of artificial intelligence in cultural dissemination, can overcome language barriers and cultural differences, providing new pathways for the inheritance and promotion of intangible cultural heritage vocal music. This paper explores the application value of AIGC technology in intangible cultural heritage vocal music from a cross-cultural communication perspective, analyzing its role in promoting global spread. It also proposes several targeted application strategies aimed at enhancing the international recognition and dissemination effect of intangible cultural heritage vocal music, promoting its sustainable development in modern society.

KEYWORDS

cross-cultural communication; intangible cultural heritage vocal music; AIGC technology

Intangible cultural heritage vocal music is a treasure of ethnic cultures, carrying profound historical and artistic value. However, in the face of globalization and cultural differences, traditional methods of dissemination struggle to effectively convey its essence in cross-cultural exchanges. The emergence of AIGC technology has brought new opportunities for the spread of intangible cultural heritage vocal music. Through the application of this technology, not only can linguistic and cultural barriers be overcome, but it also injects new forms of expression and channels into the dissemination of intangible cultural heritage vocal music. This article will explore how AIGC technology can promote the application and development of intangible cultural heritage vocal music in cross-cultural communication, and propose specific strategies.

1 The application value of AIGC technology in intangible cultural heritage vocal music from the perspective of cross-cultural communication

In the context of globalization, the inheritance and dissemination of intangible cultural heritage vocal music face numerous challenges, especially in cross-cultural communication. Language barriers and cultural differences often make it difficult for traditional vocal music to be widely understood and accepted. The application of AIGC technology can effectively address these issues, opening up new avenues for the international spread of intangible cultural heritage vocal music. With the support of artificial intelligence, the audio, text, and related cultural elements of intangible cultural heritage vocal music can be accurately recorded and preserved, enabling efficient dissemination on a global scale.

AIGC technology not only breaks down language barriers but also enhances the dissemination of intangible cultural heritage vocal music across diverse cultural backgrounds through audio synthesis and speech translation. The technology helps transform traditional vocal works into forms suitable for different cultural groups, ensuring that their artistic value and cultural significance are preserved. In today's world of increasingly frequent cultural exchanges, this technological application can significantly boost the global recognition of intangible cultural heritage vocal music, while also fostering interaction and integration among diverse cultures^[1]. In addition, AIGC technology can make the dissemination forms of intangible cultural heritage vocal music more diverse, and innovative performance methods can attract more international audiences' interest.

2 Application strategies of AIGC technology in intangible cultural heritage vocal music from the perspective of cross-cultural communication

2.1 Digital preservation to enhance the global influence of intangible cultural heritage vocal music

As globalization continues to advance, intangible cultural heritage (ICH) faces increasing challenges in preservation and transmission. Traditional vocal forms, in particular, are at risk of being forgotten or lost due to their unique performance techniques, expressive styles, and cultural backgrounds. Therefore, how to effectively preserve these traditions through technological means has become a critical issue for ICH vocal music. In this context, AIGC (Artificial

Intelligence Generated Content) technology offers new possibilities for the digital preservation and dissemination of ICH vocal music.

AIGC technology can achieve precise recording and recreation of intangible cultural heritage vocal music by simulating and reproducing traditional vocal audio, video, and related cultural elements. Specifically, AI voice synthesis technology can reconstruct and generate certain lost traditional melodies and singing techniques. For example, folk songs and traditional operas from specific regions have been difficult to recreate due to the lack of systematic documentation and inheritance over time. Through AIGC technology, AI systems can analyze existing audio samples and combine them with relevant music theory, using machine learning algorithms to restore the original vocal style. This not only helps preserve vocal music but also enhances the dissemination and educational value of such musical forms. Taking "Peking Opera" as an example, in recent years, AI technology has been used to analyze and reconstruct the singing techniques of female roles in Peking Opera repertoire, achieving some success. By processing large amounts of audio data and performance materials, AI models can learn the unique vocal techniques, rhythmic changes, and singing characteristics of female roles, and generate new singing samples based on this knowledge, even mimicking the singing features of multiple classic female roles. This process not only provides a digital solution for the preservation of Peking Opera but also enables this intangible cultural heritage art form to reach a wider audience through new digital channels. The ball audience shows its charm.

In addition to audio synthesis, AIGC technology can also be applied to the creation of text and video content related to intangible cultural heritage vocal music. When digitizing traditional vocal works for dissemination, combining AI-generated background knowledge and cultural stories allows audiences to gain a deeper understanding of their cultural roots and historical context while enjoying the vocal pieces. For example, AI can automatically generate multimedia materials related to intangible cultural heritage vocal works, providing detailed information on cultural background, singing techniques, and historical context, helping the audience understand these works more comprehensively. This multi-dimensional presentation across media helps enhance the cultural significance and artistic value of intangible cultural heritage vocal music, especially during cross-cultural communication, effectively increasing its global recognition and acceptance.^[2] In addition, AIGC technology has profound implications for the dissemination of intangible cultural heritage vocal music in a global context. Through digital preservation and reproduction, such music is no longer confined to specific regions and cultural backgrounds but can be spread worldwide via the internet and virtual platforms. For instance, traditional Chinese folk songs and Tibetan ballads, among other forms of intangible cultural heritage vocal music, have been digitally preserved and presented using AIGC technology.

2.2 Break through the language barrier and enhance the international awareness of intangible cultural heritage vocal music

In cross-cultural communication, language is a significant barrier hindering the exchange between different cultures. This is especially true for the dissemination of intangible cultural heritage vocal music, where differences in language, phonetics, and cultural background make it difficult for global audiences to fully understand and appreciate traditional vocal arts. Therefore, how to break through this linguistic barrier and enhance the international recognition of intangible cultural heritage vocal music is an urgent issue that needs to be addressed in current cultural dissemination efforts. In this process, AIGC technology offers important solutions, particularly in language translation and cultural interpretation, which will greatly improve the international dissemination effect of intangible cultural heritage vocal music.

In AIGC technology, machine translation based on deep learning and natural language processing can accurately translate and convey the lyrics, singing techniques, and cultural connotations of intangible cultural heritage vocal works. For example, certain ethnic folk songs often use dialects, specific vocabulary, and contexts that foreign audiences find difficult to understand. Many lyrics and performance styles in Tibetan folk songs are rich in the unique historical and cultural heritage of Tibet. Traditional manual translation usually requires a considerable amount of time to interpret word by word and is often unable to convey the deeper cultural significance of the song. In contrast, AIGC technology, through advanced speech recognition and automatic translation systems, can quickly and efficiently translate song content into multiple languages within a short period. It not only maintains the accuracy of the sentences but also conveys the emotional tone of the original vocal music through emotion recognition technology. AI can also automatically adjust the language style and expression according to different cultural backgrounds, making it more suitable for the reception habits of the target culture.^[3] For example, certain ethnic music often carries deep local characteristics and emotional hues that are difficult to convey directly to foreign audiences. Through AIGC technology, sentiment analysis and tone synthesis can be utilized to ensure that the translated content retains as much of the original works emotional expression as possible. For instance, Tibetan folk songs mostly tell stories of the Tibetan peoples love for life and nature, with lyrics infused with many traditional Tibetan humanistic sentiments. With the help of AIGC technology, AI systems not only complete the linguistic transformation of lyrics but also simulate the emotional expression of Tibetan singers through

adjustments in pitch and rhythm, allowing the translated works to convey richer emotional layers and enhance resonance among international audiences.

Not only that, the language conversion function of AIGC technology can provide richer channels for the dissemination of intangible cultural heritage vocal music. In traditional dissemination of such music, language differences often become a bottleneck that hinders its international spread. However, through multilingual subtitles, translated audio, and accompanying cultural annotations generated by AIGC technology, cross-linguistic communication of intangible cultural heritage vocal music can be achieved globally. For example, traditional songs from ethnic minorities like Tibetans and Miao people were originally difficult to reach foreign audiences through text and sound alone. Now, with the help of multilingual translations and voice synthesis generated by AIGC technology, audiences around the world can not only hear authentic vocal music but also understand the cultural stories and emotional expressions behind it through synchronized translation and annotations, thus achieving a comprehensive understanding of intangible cultural heritage vocal music. Moreover, while breaking down language barriers, AIGC technology can also bring intangible cultural heritage vocal music onto broader international stages via global online platforms. For instance, some works of intangible cultural heritage vocal music have already been widely watched and listened to by users in different languages through international platforms like YouTube and X, thanks to multilingual versions generated by AI technology. Technologies such as AI-generated subtitles, voiceovers, and virtual tour guides can help foreign audiences better understand and appreciate these intangible cultural heritage works, thereby enhancing their international presence and recognition.

2.3 Innovate communication methods and expand the performance dimensions of intangible cultural heritage music

In the traditional dissemination of intangible cultural heritage vocal music, the channels and forms of expression have been relatively monolithic, typically relying on live performances, audio recordings, and textual descriptions. While these methods are effective, they are limited by spatial and temporal constraints, failing to meet the diverse cultural needs of contemporary audiences. Especially in cross-cultural communication, how to leverage modern technology to expand the expressive dimensions of intangible cultural heritage vocal music has become crucial for enhancing its dissemination effectiveness. The application of AIGC technology offers new avenues for the dissemination of intangible cultural heritage vocal music, enabling it to transcend the limitations of traditional media and form a richer and more varied range of expressions.

Taking "Jiangnan Silk and Bamboo" as an example, this is a typical form of traditional Chinese music. Jiangnan Silk and Bamboo enjoys high prestige among the people for its melodious tunes and exquisite performance techniques. However, the dissemination of this musical form typically relies on audio recordings and live performances, which makes it difficult to widely convey its intricate playing skills and rich cultural background to non-professional audiences through traditional means. With the help of AIGC technology, especially the integration of virtual reality (VR) and augmented reality (AR), the performance process, cultural connotations, and technical details of "Jiangnan Silk and Bamboo" can be presented to the audience through immersive experiences. By wearing VR glasses, viewers can immerse themselves in the virtual performance venue, experiencing every detail of the instruments play from all angles. AI technology can also simulate the movements and environment of performers, recreating the delicate artistic atmosphere of Jiangnan Silk and Bamboo music, allowing the audience to experience it as if they were there, thereby gaining a deeper understanding and appreciation of this intangible cultural heritage. In addition to the application of virtual reality technology, AIGC technology can also innovate in the reproduction and expression of sound^[4]. Many delicate vocal performances in intangible cultural heritage music often fail to be perfectly showcased due to limitations in recording technology. AI voice synthesis technology, through deep learning, can accurately reproduce traditional singing techniques and even adjust the vocal expression of musical works according to different cultural backgrounds and language habits. For example, for Miao ethnic mountain songs, AI can generate synthesized voices with various ranges and styles based on traditional singing methods, and optimize the resonance and emotional expression of the voice through algorithmic optimization, making it closer to the original traditional style.

Another significant advantage of digital technology lies in its ability to integrate intangible cultural heritage vocal works with modern visual arts, thereby innovating their forms of expression. For instance, combining AIGC technology with video production allows intangible cultural heritage vocals to present their unique artistic beauty through dynamic imagery. By merging traditional song and dance performances, opera art with contemporary image synthesis techniques, visually impactful music videos can be generated, making them more accessible to modern audiences worldwide. Taking Peking Opera as an example, the traditional performance style is highly stylized, which may make it difficult for external audiences to understand due to its complex performance language and cultural symbols. With the help of AIGC technology, traditional Peking Opera performances can be combined with modern digital animation to create innovative visual art pieces, ensuring that traditional Peking Opera not only preserves its cultural roots but also attracts more young

viewers.

2.4 Interdisciplinary integration to cultivate innovative talents combining technology and art

In the application of AIGC technology in intangible cultural heritage vocal music, the integration of technology and art is key to its development. Traditional forms of intangible cultural heritage vocal music typically rely on profound cultural accumulation and singing techniques, while the introduction of AIGC technology demands that artistic creators possess technical thinking and innovative capabilities. Universities and educational institutions need to achieve interdisciplinary integration in their curriculum design, providing students with a learning platform that balances art and technology. Specifically, courses such as "Digital Art and Intangible Cultural Heritage" can be offered, combining traditional music education with modern technological applications to help students understand how to integrate technological innovation into artistic creation. For example, students can learn about voice synthesis, virtual reality (VR), augmented reality (AR), and other technologies in AIGC to master how to use digital tools to recreate traditional vocal performance forms. At the same time, course content should also include in-depth analysis of intangible cultural heritage, helping students understand the essence of traditional art from the perspective of cultural inheritance. For instance, some universities have already launched interdisciplinary collaboration projects that combine computer science, artificial intelligence, and traditional art education^[5]. In these projects, students not only learn how to use AI tools to generate music but also master how to adjust algorithm parameters according to the unique characteristics of intangible cultural heritage vocal music, ensuring that technological applications align with artistic forms. In addition, interdisciplinary integration is also reflected in the practical application of actual projects. By encouraging students from art and technology majors to work together on projects, it promotes the integration of technology and art in real-world creations, leading to innovative solutions. In these projects, students not only study how to use AI technology to reconstruct traditional music but also delve into the historical background and artistic characteristics of this cultural form, ensuring that their creations meet modern dissemination needs while preserving traditional artistic value. Through such project practices, students can develop interdisciplinary integration skills through hands-on experience and enhance their innovative capabilities in the intersection of art and technology.

3 Summary

The application of AIGC technology provides innovative solutions for the cross-cultural dissemination of intangible cultural heritage vocal music. It can enhance its global recognition through multilingual translation, emotional expression, and innovative dissemination methods. This paper analyzes the value of AIGC technology and proposes corresponding dissemination strategies, emphasizing the importance of interdisciplinary integration and technological innovation. In the future, as technology continues to evolve, the international dissemination of intangible cultural heritage vocal music will become more efficient and diverse, promoting global cultural exchange and understanding.

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