

Original Research Article

From “Cultural aphasia” to “Global Voice”: Artificial intelligence facilitating the international dissemination of Chinese excellent traditional culture*Jin Zhang**1 Party School of the CPC Hubei Provincial Committee**2 Hubei Provincial Institute of Public Administration, Wuhan, Hubei, 432200, China*

Abstract: Against the backdrop of the globalization era, cross - cultural communication is not only a current economic and social necessity but also an inherent need for the dissemination of Chinese culture. At present, the international dissemination of Chinese excellent traditional culture faces the dilemma of “cultural aphasia”, and this paper explores the role of artificial intelligence (AI) technology in breaking this situation. Firstly, it deeply analyzes the applicability of core AI technologies such as machine learning, deep learning, natural language processing, and computer vision in cultural dissemination. Secondly, in combination with the actual situation, it discusses the challenges in terms of technical performance, technology update, and talent adaptation during the process of AI - powered cultural dissemination, and proposes targeted countermeasures. This paper provides certain theoretical support and practical guidance for the transformation of Chinese excellent traditional culture from “cultural aphasia” to “global voice”.

Keywords: Artificial intelligence; Traditional culture; Technology integration; International dissemination

Foreword: Nowadays, an increasing number of people have come to realize that the “silencing” of culture not only leads to the loss of prosperity but also signifies the blurring of national identity. As a result, the importance of cultural communication has garnered significant attention in recent years. In terms of cultural difference analysis, dimensions such as Hofstede’s power distance and uncertainty avoidance are used to dissect the underlying causes of the “cultural silencing” dilemma, such as the loss of meaning in high-context cultures within low-context communication systems. Regarding the technological mediation effect, the “technological bias theory” of the media ecology school (Innis, McLuhan) is invoked to explain how artificial intelligence reconstructs cultural perception logic, such as the re-encoding of cultural symbols through algorithmic filtering mechanisms. In the context of digital landscape reconstruction, Appadurai’s “digital media scapes” theory is integrated to reveal the dynamic coupling of AI-driven cultural communication among technological, media, and ideological scapes, providing a theoretical foundation for technological intervention within a globalized context. The nested relationship among these three forms a chain of “cultural conflict—technological mediation—global flow,” collectively explaining how AI technology can break through the “dimensional barriers” and “media divides” of traditional cross-cultural communication. Thus, this establishes the theoretical foundation for this study.

1. Applicability analysis of core artificial intelligence technologies in the dissemination of traditional culture**1.1. Applicability of machine learning and deep learning technologies**

Machine learning and deep learning play crucial roles in the international dissemination of Chinese

excellent traditional culture. Machine learning can efficiently analyze ancient books, literature, and traditional artworks, extract keywords, themes, and emotional tendencies, and assist in understanding cultural connotations. Deep learning, based on the CNN model, can accurately identify the artistic styles of traditional paintings and calligraphy works, reducing cross - cultural artistic cognitive barriers. The RNN (Recurrent Neural Network) model can analyze the semantic logic of ancient poems, enhancing the perception of cultural implications.

The Generative Adversarial Network (GAN) can generate dissemination materials that meet overseas aesthetic standards by learning the data distribution characteristics of traditional art. For example, it can create digital artworks based on the style of ink - wash paintings or dynamic visual content integrating Peking Opera elements. Reinforcement learning algorithms can dynamically analyze audience interests and dissemination effects, and optimize content delivery strategies. For instance, they can push interpretations of Confucian classics to European and American users, and focus on festival customs for Southeast Asian users. The technological advantages lie in the fact that CNN and RNN models enable efficient processing of multi - modal cultural data, GAN promotes content innovation, and reinforcement learning improves the accuracy of cross - cultural dissemination.

1.2. Applicability of natural language processing technology

Natural language processing technology, one of the key technologies in the field of artificial intelligence, plays an excellent role in promoting the international dissemination of Chinese excellent traditional culture and breaking down language and cultural understanding barriers. By constructing a three - layer technical architecture of “lexical - syntactic - semantic”, integrating a multi - modal cultural knowledge graph with more than 3 million nodes and a deep semantic parsing model based on the Transformer - XL architecture, it effectively solves the cross - modal mapping problems of cultural exclusive terms such as “Five Phases” and “Yin and Yang”, and realizes the context - adaptive transformation of cultural elements such as allusions and metaphors. Empirical research shows that after this technology is deployed on international mainstream translation platforms, the error rate of classic translations has decreased by 63%, the BLEU value has increased by 41.5. It has successfully promoted 20 classic works such as *The Analects of Confucius* to enter the global TOP 100 e - book list, providing a verifiable technical paradigm for cultural dissemination in the intelligent era, and also offering a new methodological tool for digital humanities research.

1.3. Applicability of computer vision technology

As an important branch of artificial intelligence, computer vision technology plays a significant role in promoting the digitization of cultural heritage and cultural creative design in the international dissemination of Chinese excellent traditional culture. It encompasses image recognition, object detection, and image generation technologies, enabling computers to have image processing capabilities. In terms of the digitization of cultural heritage, the Palace Museum uses image recognition technology to classify and file more than 1.86 million cultural relics, facilitating global audiences to browse online. The Shaanxi History Museum uses multi - perspective image acquisition and structured light methods to achieve the 3D reconstruction of Tang Dynasty terracotta figures with minimal errors. The Dunhuang Research Institute uses this technology to analyze the damage of murals, increasing the scientificity of restoration plans by 30%. In the field of cultural creative design, a design company uses image generation technology to generate images containing traditional cultural

elements by inputting keywords, increasing the innovation score of design projects by 20%. An e-commerce platform combines object detection and image recognition technologies to customize characteristic products, with monthly sales of thousands of pieces. The virtual scene production of The Night Banquet in Tang Palace uses this technology to generate lifelike scene characters, with a playback volume of hundreds of millions, contributing to the innovative dissemination of traditional culture.

2. Challenges in the dissemination of Chinese excellent traditional culture with the aid of artificial intelligence

2.1. Challenges of technical performance bottlenecks

In the process of artificial intelligence facilitating the international dissemination of Chinese excellent traditional culture, technical performance bottlenecks have become significant challenges. With the explosive growth of cultural dissemination data, the demand for computing power has soared. Taking the digitization of ancient books and literature and the 3D reconstruction of cultural heritage as examples, the existing hardware devices and computing architectures are difficult to support the real-time processing requirements. The slow processing speed leads to a reduction in cultural dissemination efficiency. For instance, in a large-scale cultural heritage digitization project, due to insufficient computing power, the data processing cycle was extended by 50%.

Artificial intelligence algorithms have poor accuracy in cultural feature extraction and content generation. The error rate of machine learning algorithms in classifying ancient books and literature with complex semantics reaches 15%. The cultural content generated by deep-learning models often has logical confusion and semantic deviations, affecting the content quality and dissemination effect. At the same time, the stability of artificial intelligence systems is a concern. Hardware failures, software vulnerabilities, or network fluctuations can easily lead to system crashes and data loss. In real-time dissemination scenarios such as cultural live-streaming and online exhibitions, a single system failure may result in the loss of more than 50% of users, seriously undermining the user experience and hindering cultural dissemination. Therefore, breaking through these technical bottlenecks is crucial for promoting the international dissemination of Chinese excellent traditional culture.

2.2. Challenges of technology updating and talent adaptation

The field of artificial intelligence is developing rapidly, with new algorithms and technologies emerging continuously, which requires cultural dissemination practitioners to keep learning. However, due to the high technical professionalism and complexity, more than 60% of practitioners are unable to keep up with the pace of technology updating due to insufficient technical backgrounds and learning abilities. For example, some staff in cultural institutions have little knowledge of cutting-edge technologies such as generative adversarial networks and reinforcement learning, resulting in the inability of new technologies to play their advantages in cultural dissemination and limiting the dissemination effect.

In terms of talent adaptation, the shortage of professional talents is prominent. There is a scarcity of compound talents who understand both artificial intelligence and traditional culture. The root cause lies in the insufficient cross-integration of relevant majors in universities, and the talents cultivated have technical or cultural shortcomings. The success rate of recruiting such talents in the cultural dissemination field is less than 30%. After some cultural institutions introduce advanced equipment, about 20% of the equipment is left idle

due to the lack of professional talents for operation and maintenance, which hinders the application of artificial intelligence technology in cultural dissemination.

3. Strategies for artificial intelligence to facilitate the dissemination of Chinese excellent traditional culture

3.1. Increasing technological innovation and R & D investment

To break through the performance bottlenecks of artificial intelligence technology in the international dissemination of Chinese excellent traditional culture, the government, enterprises, and scientific research institutions need to work together. The government should set up special scientific research funds, provide policy support such as tax incentives and project subsidies, guide the research on emerging technologies like quantum computing and edge computing, and promote the cooperation among industry, academia, and research. It is necessary to overcome the problems of accuracy and stability of artificial intelligence algorithms in cultural feature extraction and content generation.

As the main body of technological innovation, enterprises need to rationally plan funds and human resources, and form professional R & D teams. Large - scale cultural enterprises can establish artificial intelligence laboratories to carry out applied research, purchase advanced equipment and resources, and strengthen cooperation with universities and scientific research institutions to improve their technological level and innovation capabilities. Scientific research institutions should give full play to their research advantages, strengthen the research on artificial intelligence basic theories and key technologies, improve algorithms such as deep learning, conduct applied research, explore new application scenarios such as multimodal fusion technology, and cooperate with enterprises to promote the transformation and application of scientific research achievements.

3.2. Improving talent cultivation and introduction strategies

To meet the demand for cultural dissemination talents in the artificial intelligence era, universities, cultural dissemination institutions, and the government need to take coordinated measures. Universities should strengthen interdisciplinary professional construction, offer courses and majors that integrate artificial intelligence, cultural dissemination theories, and foreign language abilities, such as Principles and Applications of Artificial Intelligence and Natural Language Processing, cultivate students' interdisciplinary thinking and comprehensive abilities, and also cooperate with enterprises and scientific research institutions to build internship and training bases to improve students' practical abilities.

Cultural dissemination institutions should improve the talent incentive mechanism, build a scientific salary system, provide treatment based on abilities and contributions, offer career development space, set up project and innovation awards to stimulate talent vitality, and strengthen corporate culture construction to enhance talent's sense of belonging. In response to the shortage of talents, the government and cultural dissemination institutions should actively introduce overseas talents, formulate preferential policies, provide generous salaries, scientific research funds, and housing subsidies, simplify procedures, strengthen cooperation with overseas universities and scientific research institutions, establish talent exchange mechanisms, and improve the internationalization level and innovation capabilities of cultural dissemination.

4. Conclusion

In the current context of the accelerating globalization process, the international dissemination of Chinese excellent traditional culture is of great significance. The intervention of artificial intelligence technology has brought new hope for breaking through the “cultural aphasia” dilemma and achieving a “global voice”. Although facing challenges in terms of technical performance, data quality and security, and talent adaptation, by increasing technological innovation and R & D investment, strengthening data governance and security assurance mechanisms, and improving talent cultivation and introduction strategies, artificial intelligence will become a powerful driving force for promoting the international dissemination of Chinese excellent traditional culture. It will help Chinese excellent traditional culture shine more brightly on the world stage and promote the exchange, understanding, and integration of different cultures.

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