

The Application of Artificial Intelligence in the Dissemination of Jiangxi Folk Songs

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Abstract: With the rapid progress of artificial intelligence technology, its application in many fields has become increasingly popular. Jiangxi folk songs, as a treasure in the treasure house of traditional Chinese culture, are encountering communication challenges. The purpose of this article is to study the potential application of AI technology in the dissemination of Jiangxi folk songs, with the expectation of providing new perspectives for the preservation and innovation of Jiangxi folk songs. The article firstly outlines the historical evolution of Jiangxi folk songs and the latest progress of AI technology, and then analyses the urgency and possibility of integrating AI technology into the dissemination of Jiangxi folk songs. Finally, the article delves into the specific application strategies of AI technology in Jiangxi folk song communication, covering such cutting-edge technologies as speech recognition and synthesis, data mining and analysis, machine learning and recommender system, as well as virtual reality and augmented reality.

Keywords: Artificial intelligence; Jiangxi folk songs; Dissemination; Speech recognition; Data mining; Virtual reality.

1. Introduction

With the continuous development of science and technology, artificial intelligence technology is increasingly widely used in various fields. In the field of cultural communication, AI technology has also gradually emerged, providing a new way for the dissemination of traditional folk culture. As an important part of Chinese traditional culture, Jiangxi folk songs have a long history and rich connotation. However, in modern society, the dissemination of Jiangxi folk songs faces many challenges, such as the decrease of audience and limited dissemination channels. Therefore, it is of great significance to apply artificial intelligence technology to the dissemination of Jiangxi folk songs.

2. The Current Situation and Challenges of Jiangxi Folk Songs Dissemination

2.1. Traditional dissemination methods

As an important part of Chinese traditional culture, Jiangxi folk songs have a long history and unique regional characteristics. In the traditional way of transmission, Jiangxi folk songs are mainly transmitted through oral tradition, sheet music recordings and live performances.

Oral tradition is one of the most important ways to spread Jiangxi folk songs. In the past, Jiangxi folk songs were mainly passed down orally from the older generation to the younger generation through the memorisation of lyrics and melodies. This way has enabled Jiangxi folk songs to spread widely among the people, and has led to the formation of distinctive folk song genres.

Sheet music recording is another important way of transmission. In the past, the melodies and lyrics of Jiangxi folk songs were often recorded in the form of sheet music for preservation and dissemination. These music scores not only provided future generations with information for studying and researching Jiangxi folk songs, but also provided important support for the spread of Jiangxi folk songs.

Live performance is one of the important ways to spread

Jiangxi folk songs. In various festivals, folk customs and social occasions, Jiangxi folk songs are often presented in the form of live performance. This way can not only let the audience feel the charm of Jiangxi folk songs, but also promote the inheritance and development of folk songs.

2.2. Problems

As an important part of Chinese traditional culture, Jiangxi folk songs carry rich historical, cultural and folklore information. However, there are some problems in the process of dissemination.

Firstly, the dissemination channels of Jiangxi folk songs are relatively limited. Traditional media such as radio and television have gradually weakened the dissemination of folk songs, while new media such as the Internet and social media have provided new platforms for the dissemination of folk songs, but their dissemination effect has been greatly reduced due to the lack of effective promotion and dissemination strategies. Secondly, the audience scope of Jiangxi folk songs is limited. Due to the limitations of language, region and other factors, the dissemination of Jiangxi folk songs is mainly confined to the Jiangxi region, with a limited range of audiences, making it difficult to form a wide influence in the country. Again, the inheritance and development of Jiangxi folk songs face difficulties. With the development of the times, the singers and audiences of traditional folk songs are gradually decreasing, and young people's interest in and identification with Jiangxi folk songs are weakening, resulting in the inheritance and development of Jiangxi folk songs facing serious challenges. Finally, the existing Jiangxi folk song dissemination methods are difficult to meet the needs of modern people. The singing form and content of traditional folk songs are relatively single, which is difficult to meet the diverse aesthetic needs of modern people, and urgently needs to be reformed and developed through innovative ways [1].

2.3. Application of artificial intelligence technology in the field of communication

The application of artificial intelligence technology in the

field of communication has become an important trend in today's society. In many aspects, such as media communication, advertising promotion, social networks, etc., the application of artificial intelligence is gradually changing the traditional way of communication, bringing more innovation and possibilities for the communication industry.

First of all, in media communication, AI technology can be analysed through big data, the user's reading habits, interests and hobbies for in-depth excavation, so as to achieve accurate push, to improve the communication effect of the media. At the same time, AI can assist news gathering and editing, and improve the efficiency and quality of news reporting through automated collection, intelligent writing and other technologies [2]. Secondly, in the field of advertising promotion, AI can achieve more accurate advertising positioning and improve the conversion rate of advertisements through the analysis of user behaviour data. At the same time, AI can also achieve automated creativity and intelligent optimisation through natural language processing and other technologies to improve the creative effect of advertising. Further, in terms of social networks, AI can achieve personalised recommendations and enhance user experience through the analysis of user interaction data. At the same time, AI can also assist social platforms in content auditing and management to improve the security and efficiency of the platform [3].

3. The Application Strategy of Artificial Intelligence in The Dissemination of Jiangxi Folk Songs

3.1. Speech recognition and synthesis technology

3.1.1. Application of speech recognition technology in folk song collection

The application of speech recognition technology in folk song collection is of great significance. First of all, the traditional way of folk song collection mainly relies on manual recording, which is less efficient, while the application of speech recognition technology can greatly improve the collection efficiency. Through speech recognition technology, the singing voice of folk songs can be quickly converted into text, so as to achieve the arrangement and preservation of lyrics and tunes of folk songs. Secondly, speech recognition technology can help researchers better analyse and study the tonal and rhythmic characteristics of folk songs, providing strong support for subsequent research and creation of folk songs. In addition, speech recognition technology can also realise the automatic classification and retrieval of folk songs, which is convenient for users to find and appreciate Jiangxi folk songs according to their own interests and needs. In short, speech recognition technology has a wide range of application prospects in the collection and collation of Jiangxi folk songs, which helps to protect and inherit the culture of Jiangxi folk songs.

3.1.2. Application of speech synthesis technology in folk song creation

Speech synthesis technology is a technology that converts text information into natural-sounding speech. In the creation of Jiangxi folk songs, speech synthesis technology can play an important role.

Firstly, speech synthesis technology can help composers quickly generate lyrics of folk songs. By inputting the text,

speech synthesis technology can convert it into speech, and creators can listen to the speech and modify and improve it to achieve satisfactory lyrics. In addition, speech synthesis technology can also adjust the pitch, speech rate, volume and other parameters of the voice according to different folk song styles and emotions, so as to make it more in line with the specific music style and emotional expression. Secondly, speech synthesis technology can help creators create more creative folk songs. By combining different speech synthesis technology and music production technology, creators can create unique music works and enrich the artistic expression of Jiangxi folk songs. For example, voice synthesis technology can be used to synthesise the voice of a virtual singer, which can be combined with real musical instruments to create novel musical works. In addition, speech synthesis technology can also facilitate the dissemination and promotion of folk songs. By converting the lyrics and melodies of folk songs into speech, they can be applied to various scenarios, such as smart speakers and mobile phone applications. Users can enjoy Jiangxi folk songs anytime and anywhere through interaction with smart devices, increasing the spread and influence of folk songs. However, there are some challenges for speech synthesis technology in folk song creation. Firstly, due to the specificity and regionality of folk songs, speech synthesis technology may have difficulties in dealing with local characteristics and accents. Second, speech synthesis technology may also have limitations in dealing with complex musical structures and emotional expressions. Therefore, when using speech synthesis technology to create folk songs, creators need to make appropriate adjustments and optimisations to maintain the original taste and artistic charm of folk songs.

In summary, speech synthesis technology has important application value in the creation of Jiangxi folk songs. It can help creators quickly generate lyrics, create more creative works, and facilitate the dissemination and promotion of folk songs. However, it is also necessary to pay attention to the technical challenges and limitations in the application process to ensure the artistic expression and uniqueness of the folk songs.

3.2. Data Mining and Analysis Techniques

3.2.1. Application of Data Mining Technology in the Collation of Folk Song Resources

Data mining is an effective method to extract valuable information from a large amount of data, and it has a wide range of application prospects in the collation of Jiangxi folk songs resources. Firstly, data mining technology can be used for classification and archiving of folk songs. By analysing the lyrics, melody, rhythm and other characteristics of folk songs, the computer can automatically classify folk songs into different categories, such as mountain songs, ditties, dance songs, etc., which is convenient for researchers to conduct in-depth studies on various types of folk songs. Secondly, data mining technology can also be used to mine the hidden information in folk songs. For example, by analysing the key words, idioms and place names in the lyrics, it can reveal the social history, customs and religious beliefs reflected in the folk songs. In addition, data mining technology can also be used to mine the correlation between folk songs, for example, by analysing the similarity of melody, lyrics and other features between different folk songs, it can reveal the inheritance relationship and development lineage between folk songs.

In practical application, data mining technology can provide folk song researchers with convenient tools to improve the efficiency of folk song resource organisation. For example, by constructing a folk song database, researchers can conveniently search and find the required information, saving a lot of time and energy. Meanwhile, the application of data mining technology can also provide powerful support for the dissemination and promotion of folk songs. By analysing users' interests and needs, it can provide personalized folk songs recommendation for users and improve users' experience and satisfaction.

In conclusion, the application of data mining technology in the collation of Jiangxi folk songs resources is of great significance. It not only helps to deepen the understanding and research of folk song culture, but also provides new ideas and methods for the dissemination and development of folk songs. In the future research, we can look forward to the deeper application of data mining technology in the field of folk songs, contributing to the protection and development of China's rich folk song culture.

3.2.2. Application of data analysis technology in the evaluation of folk song dissemination effect

The application of data analysis technology in the evaluation of the dissemination effect of folk songs is of great significance. Through in-depth excavation and analysis of the dissemination data of Jiangxi folk songs, we can better understand the audience, dissemination channels, dissemination effect and other aspects of folk songs, so as to provide powerful support for the dissemination of folk songs.

First of all, data analysis technology can help us understand the audience of folk songs. By collecting and analysing user behaviour data in the process of folk song dissemination, such as listening, downloading, sharing, etc., we can depict the characteristics of the audience groups of folk songs, such as age, gender, geography, etc. This information is important for the development of targeted communication strategies. Secondly, data analysis technology can reveal the communication channels of folk songs. By analysing the dissemination effect of folk songs on different dissemination channels, such as audio platforms, social media, etc., it is possible to find out the most effective dissemination channels in order to better promote and disseminate Jiangxi folk songs. In addition, data analysis technology can also evaluate the dissemination effect of folk songs. By analysing the key indicators in the process of folk song dissemination, such as the number of plays, likes and comments, the dissemination effect of folk songs can be objectively assessed, thus providing a basis for optimising the dissemination strategy. However, there are certain challenges in using data analysis techniques to assess the communication effect of folk songs. For example, the quality and integrity of the data may affect the accuracy of the analysis results; the diversity and complexity of folk songs may lead to difficulties in the analysis process; in addition, the protection of the copyright and privacy of the folk songs is also an issue that requires attention.

In summary, the application of data analysis techniques in the evaluation of the communication effect of Jiangxi folk songs is of great significance, which can help us better understand the audience, communication channels and communication effect of folk songs. In the process of practical application, we need to continuously optimise the analysis methods and overcome the challenges to provide strong support for the dissemination of Jiangxi folk songs.

3.3. Machine Learning and Recommendation Algorithms

3.3.1. Application of Machine Learning Technology in Folk Song Classification

The application of machine learning technology in folk song classification is an example of combining artificial intelligence with traditional music culture. By analysing a large amount of Jiangxi folk song data, machine learning algorithms can learn the features of folk songs, such as melodic patterns, rhythmic features, lyrics structure, etc., so as to achieve effective classification of folk songs [4].

Firstly, machine learning technology can help to organise and archive Jiangxi folk songs resources. Traditionally, the classification of folk songs relies on the knowledge and experience of experts, which is less efficient and easily affected by subjective factors. Through machine learning, it can automate the processing of large amounts of data, quickly complete the classification of folk songs, and improve the efficiency of resource organisation. Secondly, machine learning can help discover the intrinsic connection between folk songs. By analysing the melody, rhythm and other features of folk songs, machine learning algorithms can reveal the similarities between different folk songs, thus helping to study the genres, historical evolution and cultural connotations of Jiangxi folk songs. In addition, machine learning can also assist in the creation of new folk songs. By learning and imitating classic folk songs, machine learning models can generate new melodies and lyrics, injecting new vitality into traditional music. This technology has a broad application prospect in the creation of new folk songs, and can help music creators create works that meet modern aesthetics while retaining traditional elements. However, the application of machine learning in folk song classification also faces some challenges. For example, due to the diversity and regionality of folk songs, it is a challenge to design algorithms that can adapt to different styles. Meanwhile, protecting intellectual property rights and respecting traditional culture are also issues that must be considered when using machine learning techniques.

In conclusion, the application of machine learning technology in the classification of Jiangxi folk songs not only improves the efficiency of the collation of folk song resources, but also helps to protect and pass on traditional culture, while providing the possibility of new types of creation. With the continuous progress of technology, the application of artificial intelligence in the dissemination of folk songs will be more in-depth, bringing new opportunities for the inheritance and development of traditional music culture.

3.3.2. Application of recommendation algorithm in personalised recommendation of folk songs

The application of recommendation algorithm in personalised recommendation of folk songs is an important research direction. Recommendation algorithms can recommend folk songs for users that they may be interested in according to their historical behaviour and preferences. This personalised recommendation can help users better discover and enjoy the charm of Jiangxi folk songs.

Recommendation algorithms can learn users' preferences by analysing their behavioural data. For example, if a user often listens to a certain type of Jiangxi folk songs, the recommendation algorithm can infer that this user may also be interested in other similar types of folk songs. In this way, the recommendation algorithm can help users discover folk

songs they may not have heard before, thus enriching their music experience.

Recommendation algorithms can also use a user's social network information to provide more personalised recommendations. For example, if two users follow the same topics or hashtags on a social network, the recommendation algorithm can infer that the two users may have common interests. In this case, the recommendation algorithm can provide these two users with mutually recommended folk songs, thus helping them discover new music. However, recommendation algorithms face some challenges in their application. Firstly, recommendation algorithms may not be able to provide users with very precise recommendations as their behavioural data may be limited. Second, recommendation algorithms may be susceptible to the cold-start problem, i.e., new users or new folk songs may not get enough recommendations. To address these issues, researchers are continuously improving recommendation algorithms to make them more accurate and robust.

Overall, the application of recommendation algorithms in personalised recommendation of folk songs has great potential. By exploiting users' historical behaviours and preferences, recommendation algorithms can provide users with more personalised recommendations to help them better discover and enjoy the charm of Jiangxi folk songs. Future research will continue to improve the recommendation algorithms to make them more accurate and effective and provide users with a better music experience.

3.4. Virtual Reality and Augmented Reality Technology

3.4.1. Application of virtual reality technology in folk song immersion experience

Virtual reality technology is a technology that can create a virtual environment in which people can immerse themselves and interact with it. In Jiangxi folk song communication, virtual reality technology has a wide range of application prospects [5].

Firstly, virtual reality technology can create an immersive folk song experience environment. Through VR helmets, handles and other devices, the audience can enter into a virtual world of Jiangxi folk songs and feel the strong regional culture and ethnic customs. In this virtual environment, the audience can not only hear the melody of the folk song, but also see the scene of the folk song performance, and can even participate in the folk song performance and interact with the virtual characters, so as to understand and feel the charm of Jiangxi folk song more deeply. Secondly, virtual reality technology can break the geographical limitations and promote the dissemination of Jiangxi folk songs. Due to geographical, economic and other factors, the traditional music of many places can not be effectively spread. And through virtual reality technology, Jiangxi folk songs can be brought to all over the world, so that more people have the opportunity to appreciate these excellent traditional cultures. In addition, virtual reality technology can also provide help for the protection and inheritance of Jiangxi folk songs. Through virtual reality technology, Jiangxi folk songs can be digitally preserved so that they can be preserved permanently. At the same time, through virtual reality technology, it can let more people participate in the inheritance of folk songs, and stimulate their interest and love for Jiangxi folk songs.

In conclusion, the application of virtual reality technology in the dissemination of Jiangxi folk songs can provide the

audience with a brand-new way of experiencing folk songs, break the geographical limitations, promote the dissemination of Jiangxi folk songs, and at the same time, help the protection and inheritance of Jiangxi folk songs. In the future development, we expect virtual reality technology to play a greater role in the dissemination of Jiangxi folk songs.

3.4.2. Application of augmented reality technology in the interactive dissemination of folk songs

The application of augmented reality technology in the interactive dissemination of folk songs has injected new vigour into traditional music. Through augmented reality technology, users can experience a more realistic and immersive folk song interaction in a virtual environment.

Firstly, augmented reality technology can create a virtual interactive environment that enables users to interact with virtual folk song elements. For example, users can watch virtual folk song performers or even sing along with virtual performers through mobile devices or AR glasses. This interactivity enables users to experience and understand folk songs more deeply, improving their participation and experience. Second, augmented reality can also provide users with more information and background knowledge. In the augmented reality environment, users can click or touch the virtual elements to obtain detailed information about the folk songs, including the background of creation, historical origin, and explanation of the lyrics. This approach can not only increase users' understanding of folk songs, but also stimulate their interest in folk songs and promote the dissemination and inheritance of folk songs. In addition, augmented reality technology can also provide users with a new way of creating and performing folk songs. Through augmented reality technology, users can combine their voices and movements with virtual folk song elements to create a unique performance effect. This creation method can not only stimulate users' creativity, but also bring new possibilities for the development of folk songs. However, the application of augmented reality technology in the interactive communication of folk songs also faces some challenges. Firstly, the complexity and cost of the technology is high, requiring professional equipment and software support. Second, the popularity of augmented reality technology is limited and may not reach all users. In addition, over-reliance on the technology may lead to users' neglect of the real world, interpersonal interactions and traditional culture.

In summary, the application of augmented reality technology in the interactive communication of folk songs has injected new vigour into traditional music [6], providing a more realistic and immersive experience. However, the complexity and cost of the technology are high and its popularity is limited, requiring further research and exploration. In the future, with the advancement and popularisation of the technology, augmented reality is expected to play a greater role in the dissemination and transmission of folk songs [7].

4. Challenges and Coping Strategies

4.1. Challenges at the technical level

Challenges at the technical level are one of the main problems faced by AI in the dissemination of Jiangxi folk songs. Firstly, due to the diversity and uniqueness of Jiangxi folk songs, a large amount of folk song data with local characteristics is needed for training; however, the amount of existing folk song data is relatively small, which makes the

accuracy of AI in tasks such as folk song recognition and classification suffer [8]. Secondly, the lyrics and melodies of folk songs have a certain degree of complexity, which makes it difficult for existing speech recognition and synthesis techniques to achieve ideal recognition and restoration results. In addition, AI techniques have certain limitations when dealing with dynamically changing musical signals and musical melodies across registers. Secondly, the application of AI technology in folk song communication requires powerful computing and storage resources, which limits its popularity in practical application to a certain extent. In addition, with the continuous updating and development of technology, how to maintain the advancement and adaptability of technology, so that the application of AI in Jiangxi folk song dissemination is always maintained at a high level, is also a technical challenge to be faced [9]. Finally, the application of AI technology in folk song dissemination involves the issues of data security and privacy protection. How to reasonably use AI technology for folk song dissemination under the premise of protecting user privacy and data security is a problem that needs to be solved. To sum up, the challenge of the technical level is an important problem to be overcome in the dissemination of AI in Jiangxi folk songs, and researchers need to continuously explore and innovate in order to improve the application of AI in the field of folk song dissemination.

4.2. Challenges at the Humanistic Level

In the process of using AI technology to promote Jiangxi folk songs, in addition to the challenges at the technical level, there are also some challenges at the humanistic level [10].

First of all, as an orally inherited art form, folk songs have rich connotations and distinctive regional characteristics, and contain a wealth of information about history, culture, and folklore. However, AI technology may have comprehension bias when dealing with such diverse and complex information, resulting in the loss of the original mood and emotion of folk songs. Secondly, the dissemination of folk songs is not only the transmission of technology, but also a cultural inheritance. In this process, the protection of the rights and interests of the inheritors needs to be taken into account. How to ensure that in the process of using AI technology to disseminate folk songs, it can give full play to the advantages of the technology while respecting and protecting the rights and interests of the inheritors is a problem that needs to be solved urgently. Once again, the popularisation and application of AI technology may have an impact on the traditional dissemination of folk songs, and may even threaten the survival of folk songs. How to protect and pass on the traditional art form of folk songs while using AI technology to promote folk songs is an issue that requires in-depth consideration [11]. Finally, the application of AI technology may lead to excessive commercialisation and entertainment of folk songs. How to maintain the artistry and purity of folk songs in the context of commercialisation and entertainment is an issue that needs attention.

Overall, the application of AI technology in the dissemination of Jiangxi folk songs brings convenience and opportunities as well as challenges and problems. We need to take these humanistic-level challenges into full consideration while promoting the application, and take effective measures to ensure that the application of AI technology can truly promote the dissemination and development of Jiangxi folk songs [12].

4.3. Coping strategies

To cope with the challenges faced by AI in the dissemination of Jiangxi folk songs, comprehensive measures need to be taken at multiple levels, such as technology and humanities. On the technical level, firstly, R&D efforts should be increased to continuously improve the ability of AI technology in recognition, synthesis, data mining and analysis to meet the diversified needs of folk song communication. Secondly, attention should be paid to the popularity and applicability of the technology so that more people can access and use AI technology for folk song dissemination. In addition, it is necessary to strengthen the regulation of AI technology to ensure that its application in folk song dissemination will not violate intellectual property rights and privacy rights.

At the humanistic level, firstly, it is necessary to strengthen the training of talents and cultivate a group of composite talents who understand information technology as well as are familiar with the culture of folk songs, in order to promote the in-depth integration of AI technology and Jiangxi folk songs. Secondly, it is necessary to strengthen the education of folk song culture, improve the public's sense of identity and protection of Jiangxi folk songs, and create a good cultural atmosphere for the application of AI technology. In addition, it is also necessary to deeply excavate and inherit the cultural connotation of Jiangxi folk songs, and combine it with modern lifestyles, so as to provide rich content resources for the application of AI technology in the dissemination of folk songs.

At the policy level, government departments should introduce relevant policies to encourage and support the combination of AI technology and the dissemination of Jiangxi folk songs. For example, enterprises and social capital can be guided to invest in the research and development and application of AI in the field of folk song dissemination by setting up special funds and providing tax incentives. At the same time, it is necessary to strengthen cross-sectoral collaboration and promote resource sharing and collaborative innovation in the fields of culture, science and technology, education and other fields, so as to provide strong support for the application of AI in the dissemination of Jiangxi folk songs [13].

5. Conclusion

The application of artificial intelligence technology in the dissemination of Jiangxi folk songs not only enriches the means of dissemination, but also improves the efficiency and interactivity of dissemination. Through advanced technologies such as speech recognition and synthesis, data mining and analysis, machine learning and recommendation algorithms, as well as virtual reality and augmented reality, Jiangxi folk songs can be presented to the general audience in a new way, which not only promotes the popularity of the folk songs, but also deepens people's understanding of and love for the traditional music culture. At the same time, the application of artificial intelligence technology also brings new possibilities for the creation, performance and dissemination of folk songs, and injects new vitality into the inheritance and development of traditional music culture. However, we should also be soberly aware that the application of AI in the dissemination of folk songs still faces many challenges, and requires the joint efforts of researchers, cultural inheritors, policy makers and the general public to promote the deep

integration of AI technology and Jiangxi folk songs, and to contribute more power to the inheritance and development of traditional culture.

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