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On the Role of Computers in Guangxi Folk Songs

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ABSTRACT

This paper explores the role of computer technology in the development of Guangxi folk songs and analyzes its impact on the inheritance and innovation of traditional music. The role of computer music in Guangxi folk songs is studied through interviews, observations and other research methods. The history of computer music entering Guangxi folk songs is reviewed, and how computer music enters Guangxi folk songs and merges with Guangxi folk songs is analyzed. Through this study, it aims to provide guidance for musicians and researchers and promote the modernization transformation and innovative regeneration of Guangxi folk songs.

Introduction

This section aims to present the background and significance of the problem that led to the research. It highlights key gaps in existing studies to underscore the necessity of this inquiry.

Guangxi folk songs refer to traditional songs created and performed by various ethnic groups in the Guangxi Zhuang Autonomous Region, including the Zhuang, Han, and Yao peoples. These songs are known for their melodious tunes, lively rhythms, and lyrical yet humorous content. They encompass a wide range of themes, such as natural landscapes, agricultural labor, social life, and more. Beyond their aesthetic value, Guangxi folk songs reflect the unique cultural identities of local ethnic communities and offer rich material for the study of regional history and culture.

Among these traditions, Zhuang folk songs hold a particularly significant place in Guangxi's ethnic musical heritage. These songs, performed by the Zhuang people on various occasions—such as during work, daily life, and festive entertainment—are expressed through oral transmission and traditional instruments (Liang Yanhua, 2023). With their distinctive musical style, they have been widely preserved and passed down across generations, playing an integral role in the broader context of Chinese folk music. However, the advancement of modern society and the acceleration of economic globalization have presented new challenges to their preservation and continuity (Zhu Tengjiao, 2023).

In the 21st century, the rapid rise of digital technology—particularly the pervasive influence of the Internet—has brought about transformative changes to traditional cultural forms, including Guangxi Zhuang folk songs. While these technologies have opened up unprecedented opportunities for dissemination, innovation, and global reach, they have also introduced complex challenges. On the one hand, digital platforms enable easy access, sharing, production, and distribution of folk music. This evolution offers promising possibilities for the revitalization and popularization of Guangxi folk songs. On the other hand, the ease of access can lead to superficial or commercialized interpretations. Some content creators, driven by online popularity, prioritize virility over authenticity—compromising the cultural essence and even presenting distorted or "ugly" versions of these traditional songs.

This study seeks to examine the role of computer technology in the development and transmission of Guangxi folk songs. It aims to clarify both the benefits and limitations that modern technology brings to the preservation of traditional music. By providing a critical analysis, this research intends to offer valuable insights for musicians, scholars, and practitioners involved in computer-assisted music production. Ultimately, it strives to promote the innovative regeneration and modernization of Guangxi folk songs while maintaining their cultural integrity.

Literature Review and Theoretical Framework

Academic research on Guangxi Zhuang folk songs has yielded abundant and impressive results. Numerous papers and monographs have been published in this field. From a historical perspective, large-scale scholarly attention to Guangxi Zhuang folk songs only began in the 1980s. Since then, research has expanded significantly, covering various dimensions of their cultural, historical, and musical value.

One notable area of study involves examining Guangxi Zhuang folk songs through the lens of modern media. In her work Exploration of Guangxi Folk Songs Culture in Modern Media Communication, Wei Fang (2016) analyzes how modern mass media—such as newspapers, magazines, radio, film, television, and the internet—have influenced the dissemination of Guangxi folk song culture. Similarly, in A Brief Analysis of the New Forms of Online Dissemination of Zhuang Folk Songs, Nie Guoli and Xie Fen (2015) explore how the internet era has transformed the dissemination environment, emphasizing the increasing diversification of transmission methods. Other scholars, such as Xiang Yiyou (2017) in Thoughts on the Current Cultural Ecology (I), and Liu Jing (2016) in Thoughts on the Inheritance and Development of Jing Folk Songs in the "Internet +" Era, also examine how electronic media is reshaping the development and inheritance patterns of Guangxi Zhuang folk songs.

The academic community has also conducted in-depth research on the protection and inheritance of Guangxi Zhuang folk songs. In their 2010 book Research on the Inheritance of Dong Song Art, Zhang Zezhong and Wei Fang adopt a postmodern theoretical lens to analyze how Dong song art is inherited during China's societal transformation. Wu Xiaoshan (2007), in his master's thesis The Current Situation of Zhuang Folk Songs, provides a comprehensive analysis of the challenges facing Zhuang folk songs and identifies contemporary opportunities for their survival and development. Tian Lijun (2006), in The Survival Situation and Cultural Adaptation of the Subjects of Dong Folk Song Inheritance, focuses on the singers themselves, exploring how they respond to external cultural shifts through innovation.

Zhao Lin (2009), in his article The Inheritance and Development of Guangxi Zhuang Folk Songs in the New Era, specifically addresses the crises threatening Guangxi Zhuang folk songs in contemporary times. He proposes three strategies for their preservation: leveraging modern technology to archive folk songs, forming dedicated singing troupes, and integrating folk songs into music education curricula. Additionally, several master's theses—by Yi Xiaoping (2015), Li Linyuan (2015), Li Lu (2008), Wen Jiangtao (2007), Luo Yuanling (2004), Qin Huining (2004), and Zhu Zhizhong (2008)—examine the preservation and inheritance of Guangxi Zhuang folk songs from various perspectives, contributing valuable insights to the field.

Overall, these studies highlight contemporary crises and dilemmas while offering practical recommendations for the survival, protection, and sustainable development of Guangxi Zhuang folk songs. However, a significant research gap remains. While most existing studies focus on the inheritance and cultural preservation of these folk songs, there is a lack of systematic research on the role of computer music in their development and dissemination. This study aims to fill that gap by examining the interaction between computer music technology and Guangxi Zhuang folk songs. It will analyze how computer-assisted music production and dissemination affect the evolution, innovation, and modernization of Guangxi folk music in the digital age.

Research Objectives

In order to study the role of computer music in Guangxi folk songs

Research methods

(1) Literature review: We visited the library of the School of Music Education of Guangxi Arts Institute to collect relevant literature on "computer technology music and Guangxi folk songs", searched for relevant literature on "computer music", "computer technology and folk

songs" through China National Knowledge Infrastructure, and read and sorted out the literature.

(2) Interview method: Through interviews with three experts who have studied Guangxi folk songs and computer music, we learned about their opinions and feelings about the role of computer music in Guangxi folk songs.

(3) Observation method: Analyze and observe the computer music of Guangxi folk songs in the past 20 years, and analyze its changes and development in the past 20 years.

Result

1. Background of the Origin of Computer Music Technology

1) Technological background

The birth and development of computer music technology is inseparable from the promotion of scientific and technological progress. In the early 1950s, the advent of electronic computers laid a solid foundation for the development of computer music technology. Before that, music creation and performance mainly relied on traditional musical instruments and manpower, while the emergence of computers ushered in a new era of music creation and performance.

With the continuous development of computer technology, the processing power of computers has gradually increased, making it possible to digitally process audio signals. Before this, the processing of audio signals mainly relied on analog technology, but the emergence of digital processing technology has enabled audio signals to be recorded, edited and transmitted more accurately. This has undoubtedly brought great convenience to music creation and performance.

The advent of electronic music synthesizers, digital audio workstations and other equipment has also provided strong hardware support for the development of computer music technology. Electronic music synthesizers can simulate the sounds of various musical instruments, providing unlimited possibilities for music creation; digital audio workstations make the processing of audio signals more convenient and efficient. The invention and application of these devices have greatly enriched the connotation and extension of computer music technology.

2) Artistic Background

The development of computer music technology is closely related to musicians' pursuit of artistic innovation. At the beginning of the 20th century, the development of modern music entered a diversified stage, and composers began to try to break through the creative methods of traditional music and seek new forms of musical expression. Against this historical background, computer music technology came into being, providing musicians with a new creative field, so that music creation is no longer limited to traditional instruments and performance techniques. Therefore, the emergence of computer music technology has greatly promoted the innovation of music art.

Computer music technology provides unlimited possibilities for music creation. In the past, musicians needed to rely on physical instruments to create music, which was undoubtedly restricted by the types of instruments and playing techniques. However, computer music technology allows musicians to use computer software to simulate the sounds of various

instruments and even create new sound effects. This not only broadens the scope of music creation, but also allows musicians to freely try various musical styles and forms of expression.

Computer music technology has improved the efficiency of music creation. The traditional music creation process often requires musicians to try and adjust repeatedly, which is time-consuming and laborious. Computer music technology allows musicians to quickly create music through computer software and adjust musical elements such as melody, rhythm, harmony, etc. at any time. This greatly improves the efficiency of music creation, allowing musicians to complete their works faster and devote more time and energy to music innovation.

3) Music education background

There is a close connection between the development of computer music technology and the transformation of music education. With the increasing popularity of computer technology, the field of music education is also undergoing a profound transformation. More and more music education institutions are beginning to integrate computer technology into music teaching in order to improve the quality and efficiency of music education. At the same time, computer music technology is also playing an important role in stimulating students' interest in music and cultivating their musical innovation ability.

Computer music technology provides a new teaching method for music education. Traditional music teaching often relies on teachers' hands-on teaching, and students learn music through imitation and practice. Computer music technology provides students with a broader learning platform, where they can easily learn and create music through computer software. This teaching method not only lowers the threshold for learning music, but also enables students to explore and play more independently in the learning process.

Computer music technology helps improve the teaching efficiency of music education. In the past, music teachers needed to spend a lot of time and energy to tutor individual students, but now one-to-many teaching can be achieved through computer technology. Teachers can design teaching content in advance and then let students practice on the computer. In this way, teachers can better manage the progress of the class and have more time to tutor individual students.

Computer music technology can also stimulate students' interest in music. For many students, music courses may seem monotonous and boring, but computer music technology has injected fresh blood into music teaching. Through computer technology, students can participate in a variety of music creation and performance activities and feel the charm of music. In this process, students' interest in music is stimulated, and their love and pursuit of music will gradually increase.

Computer music technology also plays a positive role in cultivating students' music innovation ability. Computer music technology provides students with an open and free music creation environment, where they can try various music styles and creativity without restraint. In this process, students' musical thinking is expanded and their innovation ability is exercised. This is of great significance for their further development in the field of music in the future.

4) Social demand background

The development of computer music technology is closely related to social needs. In the 21st century, science and technology are developing rapidly. Computer music technology has emerged in this trend and has become a highlight of the music industry. The emergence of computer music technology has not only changed the mode of traditional music production,

but also greatly satisfied the public's diversified needs for music entertainment. With the continuous improvement of people's living standards, music entertainment has become an indispensable part of people's lives. It is in this context that computer music technology came into being, providing people with a rich and colorful music experience.

Computer music technology meets people's diverse music needs. With the popularization of the Internet, online music, mobile phone ringtones, game sound effects, etc. have become indispensable elements in people's daily lives. Computer music technology can easily realize the creation, editing, and production of music, making the forms of music works more diverse and varied. This not only provides more choices for music lovers, but also brings new business models to the music industry.

Computer music technology provides rich music resources for the fields of film, advertising, broadcasting, etc. In these industries, music often plays a finishing touch and can greatly enhance the atmosphere and emotional expression of the work. The development of computer music technology has made music production more efficient and convenient, meeting the needs of these industries for music works. At the same time, this has also provided a broader market space for music creators and promoted the prosperity and development of the music industry.

Computer music technology also promotes the development of music education. More and more schools and institutions are beginning to use computer music technology for music teaching, making music learning more lively and interesting. Students can easily learn and practice music theory through computer software and improve their musical literacy. This is of great significance for cultivating a new generation of musical talents and promoting the inheritance and development of the music industry.

5) International exchange background

The vigorous development of computer music technology is closely related to in-depth international exchanges. Since the 1970s, this technology has gained global attention and achieved significant progress. This achievement is a direct result of international cooperation and exchange, involving joint efforts between computer music research institutions, professional music schools and enterprises.

In this process, international exchanges have played a vital role, not only promoting the innovation of computer music technology, but also providing musicians around the world with a broader space for learning and development. Through these international cooperation and exchanges, computer music technologies in various countries have been able to learn from and promote each other, further enriching the forms of musical expression and means of creation.

On the one hand, the cooperation between computer music research institutions in different countries has achieved fruitful results. For example, jointly carrying out research projects, sharing research results and cultivating talents, etc., have strongly promoted the development of computer music technology. On the other hand, the exchanges between music schools also provide students with more learning opportunities, enabling them to master cutting-edge computer music creation skills and inject new vitality into the music industry.

2. Traditions and characteristics of Guangxi Zhuang folk songs

Since ancient times, Zhuang folk songs have left deep traces in the long history of Chinese culture. The history of Zhuang folk songs recorded in classics can be traced back to the Spring and Autumn Period and the Warring States Period. At that time, the "Yue People's Songs" were the prototype of Zhuang folk songs. However, the Zhuang folk songs really prospered and developed after the Song Dynasty, especially in the Ming and Qing Dynasties. During this period, various singing activities were popular among the people, such as temple fairs, weddings and funerals, agricultural festivals, etc., and Zhuang folk songs also flourished in such a cultural soil. As a nation without its own writing, the inheritance and development of Zhuang folk songs mainly rely on oral inheritance. Therefore, although Zhuang folk songs are widely circulated among the people, there are relatively few records in classics. Despite this, the records of Zhuang folk songs in these classics are still rich and diverse, providing us with valuable information for understanding and studying Zhuang folk songs.

In ancient China, scholars had a strong interest in and in-depth research on folk culture. They recorded and spread folk traditions through poetry, prose and other literary forms, among which the Zhuang folk singing tradition was particularly respected. This tradition was praised as the "Zhinwei style", which not only represents the recognition of its artistic value, but also reflects the respect for its cultural connotation.

After the founding of the People's Republic of China, the state and local governments formally recognized ethnic groups and their folk cultures and gave them "legitimacy". Against this background, the Zhuang ethnic group, a nation with rich culture and profound historical background, has received high attention from the government. As an important part of the national culture, Zhuang folk songs have also been valued at political and cultural levels.

3. The opportunity and process of introducing computer music technology into Guangxi Zhuang folk songs

The opportunity for the introduction of computer music technology into the development of Guangxi Zhuang folk songs lies in the value of computer music technology itself and its positive impact on the development of Guangxi Zhuang folk songs.

Computer music technology has greatly facilitated the recording, editing and dissemination of Zhuang folk songs. Through digital recording technology, the original sound of folk songs can be recorded with high quality, and post-processed through digital editing software to make the music effect more perfect. At the same time, with the help of modern communication channels such as the Internet and mobile media, folk songs can be quickly spread to a wider audience, thereby expanding their influence.

Computer music technology provides unlimited possibilities for the creation and innovation of Zhuang folk songs. Through music production software, creators can easily try different music styles, rhythms and melodies, combine traditional folk songs with modern music elements, and create unique new works. This innovation can not only attract more young people's attention, but also help folk songs to be revitalized in modern society.

Computer music technology can also help promote academic research and cultural exchanges of Zhuang folk songs. Through music analysis software, scholars can study the melody, rhythm, harmony and other elements of folk songs in more depth, revealing their inherent artistic laws and cultural connotations. At the same time, by holding folk music

festivals, concerts and other activities, it can promote cultural exchanges and integration between different regions and different ethnic groups.

The introduction of computer music technology is not only a positive response to the difficulties in the inheritance of traditional folk songs, but also an inevitable trend of combining modern technology with traditional art. The introduction of this technology will inject new vitality into the inheritance and development of Zhuang folk songs and promote their new glory in modern society.

The development process of introducing computer music technology into Guangxi Zhuang folk songs is a process of gradual deepening, continuous integration and innovation. This process not only involves the introduction and application of technology, but also includes the excavation and arrangement of traditional elements of folk songs, as well as the integration and innovation with modern music styles.

In terms of the introduction and application of technology, musicians and researchers in the Zhuang region have been exposed to and learned computer music technology during the development process, and have learned basic knowledge and skills in digital recording, editing, and production. With the popularization and advancement of technology, more and more music studios and institutions have begun to be equipped with advanced computer music equipment, providing hardware support for the recording and production of folk songs.

In terms of excavating and sorting out traditional elements of folk songs, musicians and researchers went deep into the folks, extensively collected original sound materials of Zhuang folk songs, and conducted in-depth analysis and research on the melody, rhythm, lyrics, etc. of folk songs. They used computer music technology to sort out and protect these traditional elements, and established a folk song database, which provided rich materials and inspiration for subsequent creation and innovation.

In terms of integration and innovation with modern music styles, musicians have begun to try to combine the traditional elements of Zhuang folk songs with modern music styles to create unique new works. They use computer music technology to create and arrange music, combining the melody of traditional folk songs with the rhythm and harmony of modern music, so that the works have both national characteristics and meet modern aesthetic needs.

From the perspective of development, computer music technology has also provided a broader platform for the dissemination and promotion of Zhuang folk songs. Through modern communication channels such as the Internet and mobile media, folk songs can be quickly spread throughout the country and even around the world, allowing more people to understand and appreciate this unique art form. In this process, the government, academia, the music industry and all sectors of society have played an important role. The government has created a good environment for the introduction and application of computer music technology by formulating relevant policies and providing financial support. The academic and music industries have promoted the application and development of computer music technology in the field of Zhuang folk songs by holding seminars, training courses and other activities. At the same time, all sectors of society have also actively participated in the inheritance and innovation of folk songs, injecting new vitality and vitality into this art form.

Discussion

After comprehensively examining the process through which computer music technology has been introduced into Guangxi Zhuang folk songs, it is evident that this transformation brings both substantial opportunities and pressing challenges. The integration of modern technology has created avenues for innovation while simultaneously prompting reflection on how to preserve the cultural integrity of this traditional art form.

Firstly, the application of advanced digital recording equipment and audio editing software has significantly enhanced the quality of Zhuang folk song recordings. These technologies allow for precise sound capture, improving the preservation of vocal nuances and instrumental textures that might otherwise be lost due to analog limitations (Wei, 2016). Furthermore, digital editing facilitates the refinement and correction of musical imperfections, which is particularly beneficial for the archival and instructional use of fragile folk materials (Liu, 2016).

Another major contribution of computer technology is in the excavation and organization of traditional elements. The systematic digitization and classification of original sound materials have improved the management and retrieval of cultural data. Establishing databases for Zhuang melodies and lyrics supports not only preservation but also scholarly research (Nie & Xie, 2015). However, preservation alone is insufficient. A critical concern is how these traditional elements can be revitalized in a modern context without compromising their authenticity—a point echoed by Wu (2007) and Zhao (2009), who emphasize the need for innovation grounded in cultural respect.

The fusion of Zhuang folk songs with modern musical styles has also yielded mixed outcomes. On the one hand, integrating contemporary rhythms and harmonies attracts younger audiences and aligns with evolving aesthetic tastes (Yi, 2015). On the other hand, over-modernization risks eroding the cultural essence and symbolic meanings embedded in these traditional songs (Tian, 2006). Therefore, maintaining a dynamic balance between tradition and innovation remains a central challenge for artists and ethnomusicologists.

In terms of dissemination and promotion, computer music technology has enabled global reach through streaming platforms and social media, offering unprecedented visibility for Zhuang folk songs. However, this global accessibility also introduces the danger of cultural homogenization—where unique traditions risk being diluted within dominant musical trends (Zhang & Wei, 2010). To safeguard the identity of Zhuang folk music, deliberate strategies are required to highlight its distinctive features during digital distribution.

Support from government bodies, academic institutions, and the music community has played a pivotal role in these developments. Yet, as Wen (2007) and Luo (2004) argue, the responsibility for cultural sustainability must extend beyond financial and policy support. A broader social commitment is essential—one that fosters cross-sector collaboration and cultivates an environment that simultaneously values innovation and tradition.

Conclusion

In conclusion, while the integration of computer music technology into the Guangxi Zhuang folk song tradition has generated promising progress, it also raises vital questions about cultural preservation, authenticity, and future direction. As globalization accelerates and

technology evolves, it is imperative to approach the modernization of folk traditions with caution, cultural sensitivity, and collective engagement. Through sustained effort and interdisciplinary cooperation, Zhuang folk songs can continue to flourish and resonate with future generations.

Recommendations

1. New Contributions to the Body of Knowledge

This research contributes to the interdisciplinary knowledge between traditional folk music and contemporary digital technology by: Bridging Ethnomusicology and Digital Technology: It demonstrates how computer music technology can serve as a dynamic tool for preserving, analyzing, and creatively developing Guangxi Zhuang folk songs, expanding the domain of digital ethnomusicology. Innovative Music Education Models: It identifies how the integration of digital music tools can enhance music learning, creativity, and accessibility, particularly in rural or minority cultural contexts. New Models for Cultural Preservation: It proposes a practical framework for the digitization, dissemination, and re-creation of ethnic music using computer-based systems—contributing to new models of intangible cultural heritage conservation in the digital age. Hybrid Cultural Expressions: It highlights how folk music traditions can evolve through technological augmentation, leading to the emergence of hybrid music styles that retain traditional roots while adopting modern aesthetics.

2. Recommendations for the Public and Stakeholders

To fully realize the benefits of integrating computer music technology with Zhuang folk songs, the following actionable recommendations are made:

1) For Cultural Institutions and Local Government

Support Digital Preservation Projects: Allocate funding and technical resources to digitize and archive Zhuang folk songs using high-fidelity recording and storage technologies.

Create Public Digital Libraries: Establish accessible online platforms where digitized folk music can be freely accessed for education, performance, and research purposes. Incorporate Folk Music in School Curricula: Develop teaching modules that integrate traditional Zhuang music with computer-assisted learning to foster cultural awareness among younger generations.

2) For Music Educators and Institutions

Adopt Digital Music Workstations (DAWs) in classrooms to facilitate interactive and creative folk music education. Train Educators in Technology Use: Provide teacher training

programs focused on the use of computer music software (e.g., Ableton Live, Cubase, Logic Pro) for traditional music instruction.

3) For Musicians and Composers

Encourage Creative Fusion: Support the production of new works that blend Zhuang folk traditions with contemporary genres using digital tools. Host Collaborative Workshops: Create opportunities for traditional musicians and digital composers to co-create new music projects.

3. Future Research Directions

To build upon the current study, future research may explore the following areas:

1) Longitudinal Impact Studies

Investigate the long-term cultural, educational, and economic impacts of introducing computer music technology to ethnic minority communities.

2) Comparative Ethnomusicology

Conduct comparative studies between Zhuang folk music and other ethnic or indigenous musical traditions (e.g., Hmong, Yi, or Karen), focusing on how digital tools are applied across cultures.

3) AI and Music Generation

Explore the use of AI-based composition tools (e.g., generative algorithms or neural networks) to analyze, replicate, or extend Zhuang melodic and rhythmic structures.

4) Digital Music Therapy

Assess the potential therapeutic applications of traditional folk music, enhanced through digital technologies, for emotional well-being, especially among the elderly in rural Guangxi.

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