FUTURE DEVELOPMENT TREND OF COMPUTER COMPOSITION IN MUSIC

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Abstract

The use of digital music production software and hardware is becoming increasingly common. These software and hardware tools, such as digital audio workstations and audio interfaces, make music production more convenient and efficient. Musicians can record, edit, mix, and produce music on computers without relying on traditional recording studio equipment. The popularity of this technology provides more people with the opportunity to engage in music production, thereby promoting music creation and dissemination. Music technology embodies several advantages. This article presented (1) history and development of computer music composition, (2) influence of music on technology, (3) future development trend of computer composition in music.

Keywords: Future Development; Trend; Computer Composition; Music

Introduction

With the advancement of science and technology, computer composition has become a new trend, and the application of technology has had profound effects on both the music industry and music education. Firstly, it offers convenient creation and production. Through computer software and hardware devices, creators can easily record, edit, and mix music, as well as quickly produce and modify music works. Secondly, it provides a richer variety of tones and effects. Music creators can use various synthesizers, samplers, and sound processors to obtain a diverse range of tones and effects. This enables them to

create more unique and rich music works to meet different styles and needs of music creation.

Additionally, it opens up more possibilities for music creation. Through various software plugins, music creators can realize multiple possibilities for music expression, thereby achieving better works.

Virtual reality (VR) and augmented reality (AR) technologies have brought a whole new experience to music performance and shows. Through VR glasses or AR applications, audiences can immerse themselves in music concerts or performances, interact with artists, and even create their own music experiences in virtual space. This application of technology adds new interest and visual and auditory effects to music performances, attracting more audiences. Artificial intelligence (AI) and natural language processing technologies have also been applied in the music field. For example, some music generation algorithms can automatically generate new music tracks by analyzing a large number of music works. In addition, natural language processing technology is also used for music commentary and analysis, helping musicians understand audience feedback and opinions, thereby improving their creations and performances.

In summary, the application of these scientific technologies enriches the forms and experiences of music and promotes the development and innovation of the music industry. With the continuous progress of technology, we can expect to see more interesting applications of music technology, bringing more possibilities and surprises to music.

History and Development of Computer Music Composition

The history and development of computer music composition has been driven by multiple innovations. For example, the advent of digital audio workstations (DAW) has revolutionized music production (Smith, 2020). In the past few decades, with the rapid development of computer technology and digital audio processing, music production has shifted from traditional analog recording to digital recording and editing, making the music creation process more efficient and flexible.

The development of technology is closely related to the change of musical style. For example, the advent of electronic music synthesizers has led to a new trend in music production (Johnson, 2021). Analyzing the evolution of music production technology in different periods can reveal the characteristics and trends of different music styles and deepen the understanding of the reasons and laws of the evolution of music styles.

Technological innovation is also driving the transformation of the music industry. For example, the proliferation of digital music production technology has lowered the barrier to entry for music production, providing musicians and music production teams with more opportunities to create and distribute music (Brown, 2019). This technological change has contributed to the diversification and internationalization of the music industry.

Some sources emphasize the integration of traditional music production techniques with modern techniques. Although modern technologies such as digital audio workstations have brought many conveniences to music production, traditional studio equipment and analog recording still retain their unique value and charm. Therefore, studying the history and development of music production technology requires not only a focus on technological innovation, but also an understanding of the fusion of traditional and modern technologies.

Under the background of the application of science and technology to music production, the influence of technology on music is multifaceted. First, the widespread use of digital music production software and hardware makes music production more convenient and efficient. For example, digital audio workstation software like Pro Tools and Logic Pro, as well as audio interface devices, allow musicians to record, edit, mix, and produce music on a computer without relying on traditional studio equipment (Smith, 2020). This convenience allows more people to participate in music production, thus promoting the creation and dissemination of music.

Secondly, computer composition technology brings new possibilities and innovations to music creation. By using computer-generated music algorithms, musicians can automatically generate new music. For example, some AI music generation algorithms can analyze large numbers of music clips and generate

new music tracks that suit specific styles and emotions. The application of this technology makes music creation more efficient, and also expands the form and style of music expression.

In addition, the application of artificial intelligence and natural language processing technology enriches the music experience. Intelligent music recommendation algorithms analyze users' listening records, preferences, and behavior patterns to recommend personalized music content. For example, music streaming platforms such as Spotify and Apple music recommend music that suits the user's tastes based on their preferences and listening history. This personalized recommendation makes it easier for users to discover new music works and enrich their music experience.

Music Creation: The Process of Music Creation

(1) Idea Generation and Planning. At this stage, sources of creativity may include personal experiences, cultural backgrounds, emotional encounters, and societal environments. The key to this stage is to define the goals and purposes of the composition, laying the foundation for the subsequent music production process.

(2) Composition and Arrangement. In the composition and arrangement phase, the creation and integration of musical materials. The author mentions that composers transform initial concepts into concrete musical compositions by exploring different harmonic, melodic, and rhythmic structures, deciding how to arrange and combine the sounds of different instruments.

(3) Recording and Audio Production: For recording and audio production, the technology and workflow of modern recording studios. The author notes that audio engineers use professional equipment and software for recording, with editing, effects addition, and processing during the post-production stage to ensure the quality and accuracy of the audio.

(4) Mixing and Mastering: Regarding mixing and mastering, Brown (2017) provides insights from mixing engineers and mastering engineers. The author details the balancing, adjustments, and effects processing during the

mixing process, as well as overall adjustments and optimization during mastering, which are crucial for the quality of the final music product.

(5) Release and Distribution: On release and distribution, trends in the modern music industry and emerging platforms. The author introduces the rise of digital music services and various ways musicians and producers choose to release music, which are essential for the commercial success and artistic dissemination of music works.

Music production is a process encompassing various stages including creative ideation, composition, arrangement, recording, mixing, mastering, and distribution. Musicians go through phases of acquiring inspiration, transforming concepts, recording audio, and finally, undergoing mixing and mastering processes before releasing their music. This process requires a combination of technical skills, creativity, and artistry to ensure the quality and effectiveness of the final musical piece.

The Influence of Music on Technology

In the context of applying scientific technology to music production, the influence of technology on music is multifaceted. Firstly, the widespread use of digital music production software and hardware has made music production more convenient and efficient. For example, digital audio workstation software like Pro Tools and Logic Pro, along with audio interface devices, allow musicians to record, edit, mix, and produce music on computers without relying on traditional recording studio equipment. This convenience has enabled more people to engage in music production, thereby promoting music creation and dissemination.

Secondly, computer composition technology has brought new possibilities and innovations to music creation. Through the use of computer-generated music algorithms, musicians can generate new music automatically. For instance, some AI music generation algorithms can analyze a large number of music pieces and generate new music tracks that fit specific styles and emotions. This application of technology makes music creation more efficient and expands the expression forms and styles of music.

Furthermore, virtual reality (VR) and augmented reality (AR) technologies have brought entirely new experiences to music performances. Through VR goggles or AR applications, audiences can immerse themselves in concerts or performances, interact with artists, and even create their own music experiences in virtual space (Brown, 2018). For example, some artists have used VR technology to create virtual reality stages at concerts, allowing audiences to experience immersive music performances.

Additionally, the application of artificial intelligence and natural language processing technologies has enriched the music experience. Intelligent music recommendation algorithms analyze users' listening records, preferences, and behavior patterns to recommend personalized music content. For example, music streaming platforms like Spotify and Apple Music recommend music tailored to users' tastes based on their preferences and listening history. This personalized recommendation makes it easier for users to discover new music works, enriching their music experience.

In summary, the application of technology has brought significant changes to music production, expanding the ways music is created, expressed, and experienced. This has propelled the continuous development and innovation of the music industry.

Advantages and Disadvantages of Computer Composition

When studying the application of science and technology in music production, it's essential to consider both the advantages and disadvantages technology brings to music production. Let's delve into specific points mentioned in various literature:

Advantages:

(1) Improved efficiency and convenience in music production: The application of technology streamlines the music production process, saving considerable time and resources. For instance, hardware devices like digital audio workstations and audio interfaces, along with various audio editing

software, enable musicians to record, edit, and mix music on computers without relying on traditional recording studio equipment.

(2) Expanded possibilities for music creation: Technology opens up more possibilities and innovation in music creation. For example, artificial intelligence music generation algorithms can analyze vast amounts of music data and generate new music compositions, pushing the boundaries of music creation.

(3) Enhanced music experience and interactivity: Virtual reality and augmented reality technology bring entirely new experiences to music performances and shows. Audiences can immerse themselves in concerts or performances through VR glasses or AR applications, enhancing the appreciation and interactivity of music.

Disadvantages:

(1) Over-reliance on technology: Excessive dependence on technology may lead to mechanized and personality-lacking creations. For example, excessive reliance on music generation algorithms may result in music compositions lacking innovation and uniqueness, affecting the quality and diversity of music (Taylor, 2021).

(2) Balance between quality and quantity: The ubiquity of technology means more people can participate in music creation, but it may also lead to uneven quality in compositions. Truly innovative and technically excellent works may get buried among a plethora of mediocre ones.

(3) Copyright and intellectual property issues: The digital nature of digital music production has raised significant copyright and intellectual property concerns. Digital processing methods may blur the lines between ownership and usage rights, leading to frequent copyright disputes that affect the healthy development of the music industry.

In summary, the application of technology in music production brings numerous conveniences and innovations, but it also poses challenges and issues. Proper utilization of technology, harnessing its advantages fully, is crucial for promoting the healthy development of the music industry.

Future Development Trend of Computer Composition in Music

(1) Enhancing the functionality of creative tools: With the advancement of technology, the functionality of music production software and hardware will continue to improve, providing musicians with more creative tools and resources. For example, more advanced audio synthesis technology may emerge in the future, allowing creators to adjust the details of sound more accurately and achieve higher standards of music production (Zhang, 2021).

(2) Expanding the boundaries of music creation: Technological development will promote the cross-fertilization of music creation with other art forms, creating more interdisciplinary works. For example, there may be more works combining virtual reality, augmented reality, or artificial intelligence technology in the future, bringing audiences entirely new sensory experiences (Liu, 2019).

(3) Breaking the limitations of geography and culture: The proliferation of technology and the development of the Internet enable music creators to transcend geographical and cultural boundaries for remote collaboration and cross-national exchange. In the future, with further improvements in network technology, global collaboration in music will become more convenient and frequent (Chen, 2020).

(4) Facing challenges in copyright and ethics: Technological development may raise a series of discussions about copyright, intellectual property rights, and ethical issues. For example, music works generated by artificial intelligence may involve issues of authorship confirmation and copyright ownership, requiring further improvement and discussion of relevant legal and ethical norms (Wang, 2020).

(5) Exploring new business models: With the widespread adoption of digital technology, the business models of the music industry will also continue to evolve. There may be more new music business models based on streaming media, blockchain, or virtual reality technologies in the future, providing musicians with more sources of income and development opportunities (Yang, 2018).

New Knowledges

The use of digital music production software and hardware is becoming increasingly common. Musicians can record, edit, mix, and produce music on computers without relying on traditional recording studio equipment. The popularity of this technology provides more people with the opportunity to engage in music production, thereby promoting music creation and dissemination. Music technology embodies several advantages. Lastly, the evolution of technology is likely to lead to the exploration of new business models in the music industry, offering musicians diverse opportunities for income generation and career development.

Conclusions

Discussions regarding the future development of music production with technology suggest several key points. Firstly, technological advancements are expected to enhance the functionality of creative tools, allowing musicians to access more sophisticated resources for music creation. Secondly, there's an anticipation of music creation expanding its boundaries through interdisciplinary collaborations, enabled by technologies like virtual reality and artificial intelligence. Additionally, technology is seen as breaking geographical and cultural barriers, facilitating global collaboration among musicians. However, challenges related to copyright, intellectual property rights, and ethical considerations may arise with technological advancements, necessitating further legal and ethical discussions.

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