Research on the Application of Computer Technology in Music Creation

Chuanli Liu¹ Lizhi Wei² Libin Chen³
Nanchang Vocational University, Nanchang, Jiangxi, 330004, China
*Corresponding author’s e-mail: qgjxzt@163.com

Abstract. Along with the development of science and technology, computer technology is not only widely used in manufacturing, IT, construction, e-commerce and other industries, but also rapidly popularized in the creation and dissemination of music. The introduction of computer technology makes music more possible in writing, polyphony, harmony and secondary creation. In a sense, computer technology can not only enrich the means and forms of music creation, but also be an essential factor in the production and development of modern music. In view of this, this paper analyzes the advantages of computer technology in music creation, and systematically explains the specific application of this technology in music writing, harmony practice, orchestration and so on.

1. Introduction
The integration of technology and art makes computer music technology come into being. It brings together the research results of acoustics, acoustics, recording engineering and information engineering. The emergence of computer music technology has opened a new era of modern music development. It breaks the limitation of traditional music creation and musical instrument playing, and realizes the creation way of music production, creation and performance, which can not only effectively control the cost of music dissemination, but also further improve the quality and efficiency of music dissemination.

2. Advantages of Computer Technology in Music Creation
In the early stage of computer development, music producers' expression of music depends on existing computer technology, such as sound sampling and synthesis. With the development of computer technology, musicians hope to enrich music creation and emotional expression with advanced technical means. The development of modern science and technology and high-precision industry accelerates the development of digital media and makes modern music more possible. The traditional recording, editing and processing of sound in the network era is gradually moving towards networking, technology and media. Computer technology in music creation is the key to the use of digital audio and MIDI technology, because they can be related between computer and music, so as to effectively realize the sharing of music information and resources. In the computer technology environment, music can be more intuitive and visual operation, which is of great benefit to the theme, structure, music score and post-production of music[1]. It is the emergence of computer technology that frees composers and musicians from traditional manual work and focuses more on the quality and emotional expression of music, thus gradually forming computer music technology.

Computer music technology is the perfect integration of music theory and production practice, and has many technical advantages and application value.
The application of computer music technology in music creation can break the limitation of traditional music production and realize the integration of composition, recording and creation. Under the new mode of music creation, the emotion and intention of musicians can be reflected more directly and effectively, and this mode can reduce the cost of music production.

Traditional music production will have some deviations in rhythm and rhythm, but computer music technology can improve the overall effect of music performance with high quality through the setting and grasping of computer system.

In the process of creation, the musicians input all kinds of collected sounds into the computer, and the computer performs a series of processing to convert them into recognizable sound signals. At the same time, the computer can also realize the dynamic image display, direct, three-dimensional presentation of the details of the musician in the process of music production and information correction, so as to make the music conception and works more perfect[2].

Computer music technology can effectively broaden the scope of use of musical instruments. Although there are many kinds of instruments in the field of music, not every musical instrument is proficient. In traditional music production mode, it is difficult for musicians to introduce musical instruments that they are not good at. The emergence of computer music technology enables musicians to use their unfamiliar musical instruments smoothly with various music software. Of course, the sounds of various non-music instruments such as water sound and thunder can also appear in music works in this way.

3. Application of Computer Technology in Music Creation

3.1. Music Writing and Expression

The use of computer technology makes the composition of music more simple and efficient. All people need to do is use the MIDI keyboard to complete the composition of the record, so that the music works on a large screen. Compared with the traditional handwritten and paper records, the use of modern technology makes the recording and modification of music score more convenient, avoiding the loss and damage of music score caused by careless custody, thus greatly saving the writing time of the works. In addition, computer technology can also make automatic creation of music themes. Musicians only need to give a dominant motivation or direction, and computer systems can make automatic orchestration. The maturity of computer technology makes all kinds of music software emerge in endlessly, which makes music creation gradually go to Dong Donghua, science and technology and intelligence. Musicians only need to input the necessary elements of music style, theme, orchestration and other works into the computer, and the computer program can automate the arrangement and creation according to the pre-set equation, and the process is simple and clear[3].

There are Cubase series, Cake walk software, Jammer, music master and so on. A new generation of music software can be MIDI input, music scanning or manual input to achieve note input, the computer can cut and paste the technology of music total spectrum, score editing. Other computer programs can also add musical instrument timbre to the music score, and then play the music by reading the data. Another form of music input is optical recognition, which uses scanners to scan paper music and input it into music software. Once these notes are imported into the computer system, the musicians are free to choose. Musicians can place or move these musical symbols, such as temporary labels, stop time marks and strong or weak marks.

Take the Mop music software developed by VOYETRA company as an example, its input mode includes the following three kinds:

| input mode       | characteristic                      |
|------------------|-------------------------------------|
| MIDI keyboard    | Convenient and fast for synthesizer input |
| Mouse input      | Accurate and convenient, but not as fast as |
Computer technology can be refined in the range, rhythm, timbre, volume, playing skills, audio and video location, so that the music is more full and three-dimensional. On this basis, computer music technology integrates the production, recording and performance of music, so as to express the music and emotion of the creator in depth. Excellent music works not only bring auditory enjoyment to the audience, but also convey the emotion behind the music and realize the emotional resonance between the audience and the musician. However, in fact, musicians in the creation of material constraints, lack of inspiration and other factors, it is difficult to convey their feelings through the work[4], which makes the creators very distressed. Therefore, some musicians will choose special bands to ensure the performance of music, and computer technology can solve this problem. Computer technology can imitate human emotional input in playing, such as the strength of breath, the control of time, the weight of kneading sound and the speed of rhythm. This makes the creator's creative process easier and the music works more complete.

### 3.2. Harmonic exercise
Harmony is the soul of music works and the important embodiment of creative people's thinking from single to multi-part. Computer technology can realize the organic combination of harmony theory and practice, and musicians can use sound sequence software to make the connection between multi-part writing, analysis and auditory training more closely. Harmony teaching software is commonly used in music creation Tonica, its biggest advantage is to realize color harmony. The principle of color harmony is to highlight the relative color change of harmony through music software, which makes the harmony of music works more individual and unique. Other music software has also adopted this technical means to break the program of harmony function and constantly pursue the individualized development of harmony. Besides Tonica, there are several related teaching software in music major.

| Software name      | characteristic                                                                 |
|--------------------|--------------------------------------------------------------------------------|
| Auralia            | High recognition and accuracy                                                  |
| Listen             | Dictation exercises, chord recognition exercises, melody and rhythm dictation exercises that support monosyllabic and interval dictation exercises |
| Practica Musica    | The function of interval and chord is stronger                                |
| Melodic Dictator   | Flexible teaching                                                              |
| Ear Master Pro     | Helps to improve musical listening ability                                    |

### 3.3. Complex thinking
Because of the addition of sound frequency, material, form, color and other elements in the computer system, polyphonic thinking is no longer a simple relationship between melody and melody, notes and notes, but the complexity relationship between notes and frequency, melody and frequency. Computer technology can effectively realize the classification and screening of materials between music and noise, thus providing more effective materials for music creation. In the creation of music, traditional musical instrument writing has the characteristics of high tone and singing, and its essence is the abstract and indirect expression of art. The application of computer technology makes the sound part of music more direct and concrete, and its cultural content can be presented more clearly. As musicians have gradually formed polyphonic thinking, on the one hand, musicians can use traditional musical instruments, indirectly and implicitly transfer their own creative ideas[5], on the other hand,
they can directly supplement the cultural connotation of music through computer technology. In this process, the characteristics and cultural connotation of music itself have been more directly reflected, which also makes music works more easily understood and loved by the public. One of the advantages of computer technology in music creation is that any musical material can be transformed into the sound needed by the creator by technical means. The application of computer technology breaks the technical limitation of note system and makes polyphonic thinking have more application carriers. When musicians consciously use polyphony thinking in the process of creating music, then music works will no longer be a simple combination of music, but a true expression of the inner feelings of the creators. Different from traditional music, computer music can form a sharp contrast in space, time and music level, and at the same time, it can adjust the level and time of music by scientific and technological means[6].

The application of computer technology makes polyphonic thinking get rid of the limitation of voice singing and musical instruments, and can realize the transformation of all sounds. In the process of music composition, polyphony thinking can compare and imitate all sounds in nature, and make sound show various forms of change by means of technology. At the same time, the use of polyphonic thinking makes each part of music creation interlaced, contrasted and interacted in space, which is no longer a simple cooperation between musical instruments. The effector in computer technology can change the sound in essence, polarize the homologous sound, and treat the heterologous sound in the same way, which makes the sound more purposeful and directional.

3.4. Matching method
In traditional music teaching, teachers often play video and teacher-student combination exercises to achieve teaching purposes. However, nowadays, teachers can easily find the timbre that is helpful to teaching through computer music software, and save it to the computer in the form of MIDI engineering documents. In the classroom, teachers explain and present music works from all aspects by loading timbre, so that students can feel the charm of music more intuitively and stereoscopic[7].

In addition, music software can also achieve arbitrary play of music. Music software can concentrate on the analysis of any piece of music in the music work, and the producer can analyze the characteristics of the harmony of the single part by superposition in turn. It can also be added or decreased to the multi-part music induction. For example, the creation of orchestral works, creators will use music software, in many classic works selected parts of the analysis and imitation of writing. This can help the creator master the basic law of orchestral music, so that the author can express the creative idea more accurately, and finally make the music works more harmonious and rich.

The key to the later stage of music production lies in orchestration and production. At present, music teaching in colleges and universities is divided into single equipment teaching and traditional mode teaching, but the efficiency and teaching effect of these two teaching methods are not ideal. The use of computer music software allows students to practice mixed timbre melodies. This can not only enrich the sound color, but also improve the sound volume, improve the overall sound quality and sound effect[8].

4. Conclusion
The use of computer technology makes music creation, teaching and performance have a richer form of presentation, but also makes the audience have a better experience in the content, emotion, level, harmony and so on of music. With the rapid development of information technology, the integration of computer technology will further develop music production technology.

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