Research and Application of Digital Audio Technology and MIDI Technology in Computer Music Production

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***Abstract*—Regarding the production of traditional music, it usually requires sufficient preparation in advance, but there is no way to avoid various problems in the recording process, which restricts the development of music production to a certain extent. The emergence of computer music, on the other hand, has effectively solved this problem and guided the development of music production in a new direction, not only improving the quality of music composition, but also injecting vitality and vitality into the production of music. This paper has done an in-depth study on this, standing on different perspectives on computer music production and traditional music production, with the aim of recognizing the impact and changes brought by the development of computer music on traditional music on the basis of clarifying the characteristics and differences between traditional music and computer music.**

Keywords—computer music production, traditional music production, characteristics, advantages

I. INTRODUCTION

With the development of the Internet, computer technology is widely used in all walks of life, and for the field of music as well, and in this environment, computer music technology was born. Computer music refers to the application of digital audio technology and MIDI technology for music creation based on the Internet. The emergence of computer music has largely changed the traditional music production methods and performance forms, effectively promoting the development of artistic creation in the field of music. The important role played by computer music technology in the field of music composition is becoming more and more evident, especially in light of the current realities.

II. ANALYSIS AND INTRODUCTION TO TRADITIONAL MUSIC

A. Characteristics of the traditional music production process

It is very complicated and tedious for the production of traditional music, the creator has to build a general outline in his mind at the early stage of creation, and to create a general melody, and to record it in detail, and to arrange the melody, and then to complete the arrangement work through the application and matching of various instruments, which takes a lot of time and energy, and the writing of the melody, the matching of instruments, and the creation of the music score puts high demands on the professional level and business ability of the music creator. And usually the arrangement work can only be carried out by one person, other people can't participate in it at the same time and can't provide strong help for it, especially in the composition of some orchestral flamboyant parts, in order to better ensure the overall effect of the music and magnificent scenes, the creator must put more energy, which also increases the task and difficulty of the creator to a certain extent. In this regard, one must properly rely on piano playing to feel the melody and at the same time enrich the expressiveness of the piece; in addition, one needs to create a good acoustic effect with one's solid basic knowledge and rich compositional experience. For this requirement, it is not difficult for some composers who are more professional, experienced and have a unique style, they have enough strength to complete the whole work, but for some young composers, they have limited experience and ability, so they will also encounter more difficulties and challenges in the process of composing.

After the work on the score is completed, the next step is to rehearse and perform, a part of the traditional music making process that occupies an important place and must be found with a professional band. The performer also needs to be familiar with the content of the score gradually through long and repeated training, to understand the intention of the creator in a real sense, and to deeply feel the thoughts and emotions contained in the work. The process also requires close communication and exchange between the creator and the performer, so that the score can be expressed more accurately and completely, avoiding any mistakes. Once a problem is identified, communication and coordination between the two parties must take place immediately to ensure that the problem is resolved before proceeding with subsequent recording and production work. In summary, it will take a lot of time and effort to successfully complete the above.

B. Limitations of traditional music

The binding nature of traditional music is manifested in three main ways, as follows.

(1) Limitations in the variety of music: Traditional music is influenced by musical instruments and therefore has certain limitations in terms of overall timbre, with a small variety of timbres, which to a large extent hinders the production and development of traditional music.

(2) Limitation of sound range: Traditional music mainly relies on traditional instruments to express itself, and because of the limitations of traditional instruments in terms of structure, materials and types, the production of traditional music is also affected to a certain extent, and the sound range is more monotonous, which affects the display of musical effects.

(3) Limitations of performance forms: Traditional music mainly relies on traditional instruments to play, usually including only a few simple ones such as hitting, playing, pulling, blowing, etc. The performance forms are traditional and single, with certain limitations.

III. Analysis and Introduction to Computer Music Production

A. The connotation of computer music production

Since recent years, with the continuous development of the Internet, computer technology has been widely used in all walks of life, and in this environment the field of music has also been affected to some extent. People are gradually focusing on the innovation and improvement of traditional music, combining computer technology with music, creating a new model of computer music production. The specific production process mainly includes the following aspects: the creator must first conceptualize the melody of the piece and make good preparations to lay a good foundation for the subsequent music production; use computer software to orchestrate the piece and select suitable instruments in the instrument database according to the different sound sources; invite a professional music production team to complete the design of the music sample and operate the relevant sequencing software to reasonably select the instruments, and do a good job of volume and rhythm regulation in the process, so as to better ensure the harmonic effect of the instruments and the performance effect of the whole piece of music.

B. Advantages of Computer Music Production

The introduction of computer technology into music composition can result in very advanced computer music production, which has certain advantages over traditional music composition.

(1) The application of computer music production models can bring out the creator's musical intentions to the fullest. In the process, with the assistance of computer software, the composer can use the music database resources to select a variety of data information combined with the actual needs, and on this basis, easily complete the scoring, orchestration and performance and other related work, in addition, the performer can also better understand the creator's performance intentions and emotional expression, so as to show the ideological connotation of the composition more comprehensively.

(2) Choosing a computerized music production mode for the creation of music pieces also saves time and effort investment effectively. For music composition, the performer and the creator must communicate deeply, in which the creator needs to indicate his or her creative intent and the performer needs to express that musical intent to the fullest. The application of computer music technology can achieve this effect, to a large extent, saving the investment of human, material and financial resources, making the rehearsal of the music more easily and efficiently, fundamentally avoiding the problem of repeated rehearsals, and to a certain extent, reducing the cost of performance training.

C. Specific requirements for computer music production

(1) Spatial three-dimensionality

For traditional music production, the main presentation vehicle is paper, while computer music production has largely enriched the presentation of music. Not only can the music be displayed on paper, but it can also be expressed through sound effects. In addition, traditional music production focuses on solos and soloists, and ignores the spatial dimensionality; computer music production has largely overturned this feature, and the process of producing music places great emphasis on spatial dimensionality, places higher requirements on the sparsity and contrast of sound and image, and is rigorous about the problem of random stacking. Compared to traditional music production, computer music production has a much wider scope, the process needs to take into account the impact of various factors, and the overall sound and visual effect is much higher.

(2) Clarity

The picture quality is clearer for computer music and blurrier for traditional music. As a whole, computer music production requires clarity of picture quality in the following areas: ensuring clarity of vocal parts and details, ensuring clarity of the orchestration function, and ensuring the distinguishability and independence of the music subject.

(3) Balance

Compared to traditional music, the computer music production process requires the use of a lot of computer software. Thus a high demand is placed on the balance of the score. Specifically as follows: firstly, the orchestration should be balanced, the process should not just rely on the auditory perception, but should be properly controlled by artificial means, and because of this, it is easy to have a confused timbre, thus affecting the overall balance of the music, for which the orchestration must be well deployed in the process of using computer music production mode; secondly, the balance of spatial stereo should be ensured, the creator should reasonably lay out the sound and image of each track according to the sound and image requirements in the working process, and do a good job of scientific distribution and coordination; if it is to show some unconventional musical effects, the authenticity of the musical effects should be ensured to avoid an excessive false feeling in the process of playing.

IV. Analysis of the Differences Between Traditional Music Composition and Computer Music Composition

In the production of traditional music, the composer's part of the score and the performer's part of the performance are important elements, requiring the creator to actively communicate with the performer after the score is composed, and then the performer uses a wealth of performance techniques to present the content of the piece. Computer music composition, on the other hand, is based on Internet technology and digital technology, using sound effects to directly reflect the music, and this new way of music composition saves human and financial resources to a large extent. However, in terms of the current reality of this type of music creation, the industry has given it mixed reviews, with most opinions agreeing that the sound quality and timbre of computer music is not comparable to that of a real band. In fact, the biggest difference in computer music compared to traditional music is the use of performance methods and the rendering of emotions, and these subtle changes in the performance process can affect the

expression and presentation of the music to a certain extent.

MIDI technology is the main technical support for computer music, and this technology takes up less memory in the computer, mainly because MIDI music files require less space and require less computer performance and configuration. Therefore, the use of MIDI technology to produce music can effectively save space and reduce the cost of investment while increasing efficiency. The orchestration and composition of the music can be done easily and freely by the creator without having to invest too much effort and manpower at all. Everything in the entire music creation process can be done by one person alone.

In recent years, with the wide application of computer technology and continuous improvement, computer music production technology has become more and more mature, gradually towards humanization and intelligence, and the authenticity of the music effect has been improved, even some computer music can be comparable to the sound produced by natural instruments, in addition, computer music has also made significant progress in the mode of performance, compared with the traditional music performance is not inferior. But even so, it is not possible to draw a direct conclusion on the merits of either, as both have their own unique advantages and drawbacks in certain circumstances, so it is necessary to decide who is better and who is worse depending on the actual performance scenario.

In this regard, in the future music creation process, traditional music and computer music must be organically integrated, learn from each other, learn from each other and complement each other, so as to fundamentally improve the overall level of creators. Some experienced traditional music creators can also appropriately adopt the computer music composition mode according to the actual needs, the process of using traditional music performance techniques to realize the sound effects, while in the process of expressing the musical content can appropriately use the traditional music orchestra thinking mode, so as to make their musical works more infectious and expressive, so as to gain more audience support and recognition.

V. Conclusion

All in all, the growth of the Internet at the moment has allowed for the widespread use of computerized music production models. The birth and development of this model has had a significant impact on the creation of traditional music, bringing with it opportunities and new challenges. From the current actual situation, computer music is incomparable to traditional music in terms of production and performance, but it cannot completely replace traditional music, both have their own advantages and characteristics, but there are also certain disadvantages. Therefore, in future artistic creation, it is necessary to consciously promote the organic integration of the two, and to choose flexibly in response to the actual situation and basic needs, so as to create more connotative musical works.

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