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Research on Visual Design of Traditional Music Based on AI Enabling Guided by Intangible Cultural Heritage Inheritance Concept

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Abstract: *In the era of network information, artificial intelligence technology has accelerated the flow of information, while the traditional intangible cultural heritage music also needs more integration and dissemination of such modern technologies in the face of the dilemma of the weak inheritance of teachers and apprentices. In this context, this research is guided by music visualization technology, combining visual design with traditional intangible cultural heritage music, and strengthening the visual comprehensibility of traditional music. This paper takes Nanyin music, Northern Shaanxi Folk Songs, Nanjing Baiju and other representative intangible cultural heritage music as examples, combining their music style characteristics. With the aid of artificial intelligence technology, it starts from animation communication, three-dimensional interaction design and music game design, and using intelligent technology to make music elements materialize, so as to achieve the goal of inheriting intangible cultural heritage through music visualization.*

Keywords: *Music as Intangible Cultural Heritage; Artificial Intelligence; Music Visualization*

1. The Concept of Traditional Music Visualization and Intelligent Presentation Mode

1.1 The Concept of Traditional Music Visualization

Music visualization is a branch technology of information visualization transformation. Music visualization takes vision as the subject of expression, breaking the boundary between hearing and vision, using digital networks and related technical equipment to transform music, an auditory element, into color, line and other visual language content according to its rhythm, and express the connotation of music and the information contained therein. This is a new form of musical expression. Music visualization uses visual images to convey the characteristics of music, further understand the information contained in music in a visible way, and provide a powerful technical way to analyze the connotation of traditional music [1].

1.2 Intelligent Presentation Mode of Music Visualization

Table 1: Intelligent Presentation Mode of Music Visualization

Static vision	Painting, posters, music scores…	It is a two-dimensional plane and the picture presentation mode is static.
Dynamic vision	Dynamic 2D image, 3D image, AR, VR imaging…	Mainly based on vision, music is used as an auxiliary tool to increase visual experience and create a new visual mode.

There are many categories of music visualization according to different forms of expression, and appropriate tools and technologies can be selected for presentation according to different types of music. In the form of visual expression, it can be divided into static vision and dynamic vision. Static vision generally refers to painting, posters, music scores, etc. It uses static pictures to express music rhythm. Its main carrier is two-dimensional plane and the picture presentation is static. Dynamic vision

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generally refers to animation, video, interactive art installations or performances, including "dynamic two-dimensional pictures, three-dimensional pictures, AR, VR imaging", etc. (as shown in Table 1). Under this technical background, this research combines the artificial intelligence technology, carries out the visual design research based on the traditional music from the perspective of intangible cultural heritage, fully develops the visual space through the way of combining static and dynamic, and uses electronic facilities to carry out three-dimensional learning and inheritance innovation for intangible cultural heritage music from both visual and auditory aspects [2].

2. Extraction of Intangible Cultural Heritage Inheritance Factors in Visual Design of Traditional Music

2.1 Nanyin Music

Nanyin music is the intangible cultural heritage of China's ancient traditional music, which plays an important role in Chinese traditional music. Nanyin music has distinct characteristics. The music of Nanyin music is elegant and melodious. It is played with clapper, upper four pipe pipa, dong xiao, two strings, three strings, lower four pipe four treasures, ring lamps, small calls, double bells, and sometimes with Nan'ao or Pinxiao. In the visualization research, it is necessary to summarize the characteristics of the graphic symbols, extract the characteristic visual symbols for combination, and embody its characteristics, so as to achieve a good combination of auditory and visual. In the composition of note elements, patterns and arrangement designs of musical notes, representative instruments and repertoire of Nanyin music should be used. Through the orderly arrangement and combination of notes, the characteristics of Nanyin music are expressed. Various aspects of design including direction, color, size and center style are formulated, and the relationship and combination between various elements are controlled to reflect the visual design beauty of Nanyin music [3].

2.2 Northern Shaanxi Folk Songs

Generally speaking, the folk songs of northern Shaanxi are mainly composed of two styles of tunes. One style is free, with strong melody ups and downs like a mountain song and passionate emotional expression. The other kind of melody, the lyrics are neat, like a minor in the expression of emotion is more euphemistic. In addition, the lyrics of Northern Shaanxi folk songs contain a large number of dialects, which is a unique feature to distinguish folk songs from other regions. In Northern Shaanxi folk songs, double syllables are used in most syllables, while trisyllables and four-character cases are rarely used. In trisyllables, the third syllable is mostly a soft voice with no real meaning, which is generally used as a filler for seven sentences in songs. On this basis, music information such as spectrum, melody, mode, tonality and lyrics can be extracted from an objective perspective, and more overlapping changes can be made to create rich visual graphics, which can perfectly show the bold and magnificent features of northern Shaanxi folk songs in the picture [4].

2.3 Nanjing Baiju

As the regional culture of Nanjing area, Nanjing Baiju will be performed as a joint form of rap art recited in old Nanjing dialect, similar to crosstalk in performance form, which can be regarded as a dialogue form with rhythm. Most of the Baiju Qupai are from folk songs of the Ming and Qing Dynasties and Jiangnan folk polls, which are full of Jiangnan characteristics; The accompaniment mostly adopts Jiangnan silk and bamboo musical instruments, such as erhu, pipa, sanxian, bamboo flute, etc., together with characteristic percussion props such as bangu, dish and wine cup, which makes the performance very lively and interesting. The most important music element in Nanjing Baiju visualization is mode, which combines different music sounds with a certain interval relationship to form an organic whole. Nanjing Baiju makes use of special modes to present music visually and smoothly, and presents white board culture in an orderly interactive way, which is conducive to the inheritance and development of white board culture [5].

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3. Application Design of Artificial Intelligence in Traditional Music Visualization under the Concept of Intangible Cultural Heritage Inheritance

3.1 Music Visualization in Animation Communication - Nanyin Music

The animation presentation of Nanyin music is a combination of "watching" and "listening", as a way of expression for audiences of different age groups. Animation communication can be connected with online digital terminal platforms such as new media and short videos with the largest audience at present, and artificial intelligence technologies such as big data, AI technology and user preference identification can be used to realize animation communication of Nanyin music. The video platform presents the picture with gorgeous effect, fast transmission speed and accurate user push. Therefore, in the process of animation design, diversified animation expression techniques can be combined with the characteristic music of Nanyin music to show its musical style characteristics of "beautiful tunes, slow rhythm, simple and elegant, euphemistic and affectionate". For example, there are six movements in Nanyin music's "A Hundred Birds Return to the Nest": "Phoenix Spreading its Wings", "Magpie Branch", "Mandarin Duck in the Water", "Butterflies Fly Twice", "Wasps Out of the Nest", and "A Spider Spinning a Web". Each chapter can be used as the theme of an animated short film, which presents images such as "Phoenix taking off and flapping its wings", "birds passing through the forest", "thousands of birds like a swarm", "birds returning to the nest like a cobweb" and so on by means of ink color, oil painting, stick figure and stop-motion animation. Through this kind of animation expression technique, the artistic conception of traditional music is more vivid and vividly displayed, so that the meaning is more clear, which can be said to be suitable for all ages.

3.2 Visualization of Music in Three-dimensional Interaction – Northern Shaanxi Folk Songs

As an emerging artificial intelligence technology, 3D interaction has few application cases in music. Its core technology helps participants to interact with pictures and audio by means of ball screen projection, virtual reality technology and gesture interaction. On this basis, the folk song of northern Shaanxi itself is loud and clear, and the words and phrases are interspersed with a large number of figurative pictures. Inspired by three-dimensional interaction, portrait gesture recognition technology can be incorporated into the 3D ring-screen-style scenes to realize the instant interaction function between video, sound and people. Take the folk song "Animal Spirit Driving" in northern Shaanxi as an example, there are three parts in the song, respectively "the voice of the mule before the animal spirit driving team arrives; White-necked pugs biting south; Confessions of a sister". For this purpose, these three parts can be integrated into a coherent 3D screen image. Through the audience at key points of the sound movement to promote the development of the story, with the background music of "Beast Spirit" to feel the immersive audio-visual effects, so as to help the interactive more in-depth understanding of the song emotion.

3.3 Music Visualization in the Music Game - Nanjing Baiju

The audience of music games tends to be teenagers and other young groups, and music games are also one of the advantageous carriers for intangible music integration. The types of music games are mainly divided into 2D, 3D, VR and other categories. Take the popular "Kingdom of Rhythm" for example. The game screen is dominated by colorful and colorful stick figures, with strong rhythmic music in the background, and the player can tap the screen to finish the game. Inspired by this, Nanjing Baiju, as a kind of local rap art, can be Nanjing Baiju's erhu, pipa, three-stringed, bamboo flute and other related Musical Instruments will be integrated into the game image elements, and the corresponding Musical Instruments will be selected and struck with song as the background sound, presenting dynamic visual sense and musical rhythm audially. Such designs can be extended to other traditional forms of music. In addition, VR external devices can also be used to create immersive music game experience for users. In the game, users can be guided to play the pipa and erhu through the device, combined with live recording, to strengthen users' self-feeling of music.

4. Conclusion

With the development of the information age, artificial intelligence is being widely used, and the development of traditional music should follow the pace of the development of the times. Music visualization technology is used to combine music culture with images, build interactive

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communication space, and combine audio-visual technology in the network world to study the connotation and characteristics of traditional music, so that more people can understand intangible cultural heritage music through music visualization, so that traditional music of intangible cultural heritage can be better protected, inherited and developed.

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