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Technical Implementation and Artistic Expression Characteristics of Multimedia Electronic Music Creation in China

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ABSTRACT

Based on the past competitions, performances and exhibited works of the Beijing International Electronic Music Festival, this paper analyzes and interprets the Chinese multimedia electronic music works from technology and art. It categorizes these works into three types based on their creative technical methods means: unidirectional audio-visual creation, bidirectional audio-visual creation, and immersive audio-visual creation. We analyze the artistic characteristics of these works from the perspectives of media symbols and audio-visual symbols. With the development of 5G and artificial intelligence technologies, Chinese electronic music continuously extends to other art forms for cross-disciplinary integration. In retracing traditional arts, it constantly derives new, subversive forms of musical artistic expression.

Keywords: Electronic Music; Multimedia Music; Visual Images; Music Creation

1. INTRODUCTION

Electronic music entered China in the 1980s, with a “serious lag” of about 40 years compared to developed countries in the West. However, in the forty years since the early 1980s, Chinese electronic music has developed rapidly, not only in the fields of audio-visual electronic music, hybrid electronic music, multimedia electronic music, and interactive electronic music, but also in the fields of electronic music combined academic and applied music. Under the influence of immersive, interactive, and multimedia technologies, electronic music has presented a multi-media integration art form. In this integration, electronic music evolves from auditory to audio-visual and even multisensory trends. Technology and art intertwine throughout the ontological creation of electronic music, leading it to a multimedia era that combines with other art genres and media across disciplines.

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The primary form of expression is now digital images and audio media, representing the sound materials, rhythms, and themes of electronic music through concrete or abstract visual content. In the trend of new technologies, the creation methods of electronic music works presented with digital images and audio media have also changed. Creators can not only create visual images closely related to musical ideas but also use real-time interactive technologies to simultaneously carry out music creativity and visual creation. For example, through computer programming, the pitch, amplitude and other attributes of music can control the changes in visual graphics, colors, and speeds in real time.

From the viewpoint of domestic and international electronic music forums and competitions, as well as the electronic music professional activities of domestic music colleges, and the emergence of forms of audiovisual works created with electronic music as the leading force, there are many different differences. In terms of numerous ways of audiovisual realization, different technologies have endowed electronic music methods combined with visual arts with distinct characteristics, giving works unique features in audio-visual language.

This paper breaks away from previous classification methods and explores the relationship between audio-visual symbols and production techniques in audio-visual electronic music. Multimedia electronic music is categorized into unidirectional, bidirectional, and immersive creation modes based on technical means, with artistic expression manifested in both audio-visual form and audio-visual connotation layers.

2. INTEGRATION OF TECHNICAL IMPLEMENTATION AND ARTISTIC EXPRESSION

Professor Zhang Xiaofu once said that audio-visual electronic music is not a simple superposition of visual images and music, but a “1+1>2” creative achievement, which is a poetic and pictorial expression of sound imagery and visual imagery abstracted again. The artistic language of contemporary electronic music has transformed from purely artistic attributes to highly technological cultural symbols in an environment of multimedia integration and various technology integration. Choosing any medium and using any technology must endow it with cultural significance, and the expression of musical connotation cannot be

separated from the symbolization of the medium. In multimedia electronic music works, not only can computers be used to distribute and process digital information such as sound, light, and images, but technology and art together constitute each cultural symbol in the artistic image, which can be homogeneously placed. In the multimedia environment communicated in digital language, the heterogeneous combination of different sensory media is “connected” together in a special “interactive” relationship. Based on this, the author proposes a five-dimensional analysis method for multimedia electronic music, including:

Immersion level. The immersion level of visuals and music determines the immersion level of multimedia electronic music in the listener’s experience, divided into: unidirectional (audio or video projected from a single side), multidirectional (multiple screens or multichannels), immersive.

Degree of freedom. The degree of freedom of visuals and music depends on the level of interaction with performers or audiences, divided into: fixed media (FixMedia, partial interaction, free interaction).

Visual source. The source of visuals, from the degree of interaction of visual sources, is divided into: pre-produced video materials, live real-time capture video, live real-time generated video.

Visual imagery. The directness of the source of visual imagery elements, from direct to indirect, is: music ontology (e.g., musical pitch, rhythm, timbre, etc.), external sources (e.g., the body movements of performers or audiences), abstract sources (some abstract interpretations, such as text, language, brain waves).

Visual connotation. Whether the visual and musical aspects of the work are culturally representational, in descending order: no cultural representation, musical symbols (e.g., using elements of Chinese calligraphy, opera, etc.), musical language (constructing a unique musical language).

In this paper, we selected five representative Chinese multimedia electronic music works, covering three generations of Chinese electronic music composers as well as different creative eras, to illustrate the above five-dimensions in detail. The first work, Professor Zhang Xiaofu’s multimedia version of “Norilang” premiered in Beijing in 2004. The music part uses Tibetan female voices and sampled chanting voices from Tibetan Buddhism as the main sound materials, transforming and developing them through audio technology and electronic production techniques. It combines the concept of the cycle of life in Tibetan culture with the cyclical sound motives (Loop) in electronic music composition, expressing the cultural creativity of “circle” and “cycle” from small cycles to large cycles. This is connected and matched with the spiral development of the overall music structure, forming a unified and complete musical logic. The visual image part uses photos and images taken in

Tibet, using image production techniques corresponding to electronic technology, such as reverse playback, constructing the composer’s unique audio-visual language. Although there were already interactive means of expression during this period (as discussed in the following example), composers still finished music and visual creation on separate production platforms, composed the music first, and then used the visual material to interpret it in one direction. Although music and visuals cannot interact, this way of composing allows for a more tangible representation of cultural connotations to a certain extent. The following is a five-dimensional analysis diagram of the work:

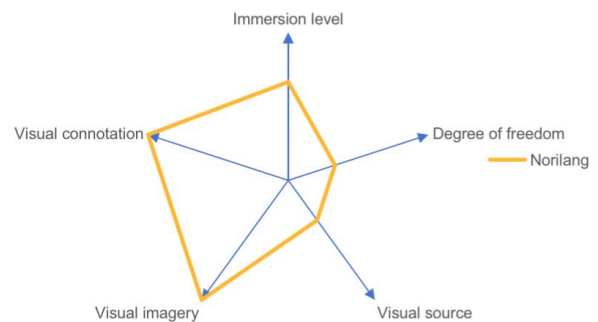


Figure 1. Five-dimensional analysis diagram of “Norilang” .



Figure 2. The performance of “Nuorilang” .

“Music in Calligraphy” by Cheng Yibing, created in 2004, which is a partially interactive musical work, the work captures the writing actions of a calligrapher, converting the actions into a part of the music during the performance. During the performance, the calligrapher’s hand is tied with 6 sensors, with 5 bending sensors tied to the 5 fingers and 1 balance sensor tied to one side of the wrist. Thus, the calligrapher’s writing actions in terms of force, displacement, bending, etc., are converted into MIDI signals in real time, forming the main body of the music, with two other elements: pure electronic improvisation on the “guqin”(Chinese instrument) and traditional ancient words sung through electronic

processing (Vocoder). The following is a five-dimensional analysis diagram of the work:

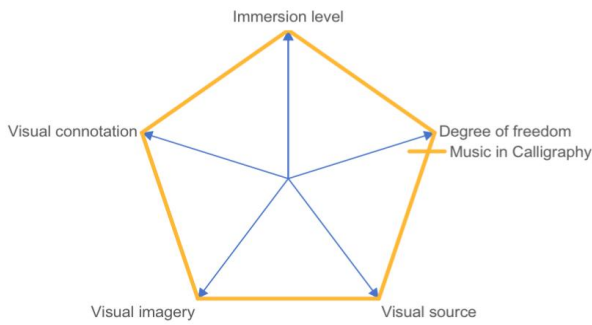


Figure 3. Five-dimensional analysis diagram of “Music in Calligraphy”.



Figure 4. The performance of “Music in Calligraphy” in 2004 Beijing International Electronic Music Festival Opening Ceremony Concert .

The work “Boundless” is a live real-time generated piece, where the spatial movement of music performance is related to visual modeling, allowing the visual content to complete the same spatial movement trajectory in the image space as the sound's phase parameters. This work is highly abstract from sound to vision, and in the process of real-time generation, sound as the dominant feature, translating timbre, dynamic expression, and spatial movement into a data-driven process that generates the modeling elements, colors, and spatial lighting effects, etc, of the image. The work is led by sound, designing the visual material's modeling elements, colors, and spatial lighting effects according to the characteristics of sound material's timbre, dynamic expression, and spatial movement; defining different image components according to the time structure of the music work, adjusting the image's expression effects at any time according to the time of the music work; and flexibly adjusting the output image's size and shape according to the live performance environment, allowing the visual content to complete the same spatial movement trajectory in the image space as the sound's phase parameters. The following is a five-dimensional analysis diagram of the work:

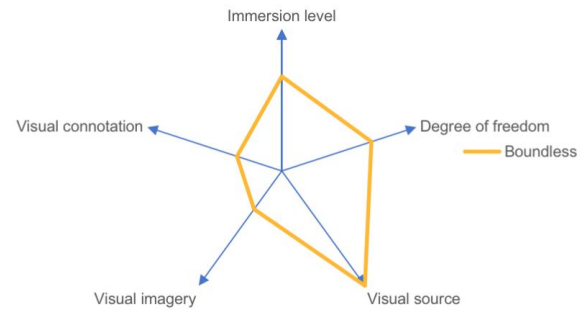


Figure 5. Five-dimensional analysis diagram of “Boundless” .



Figure 6. The performance of “Boundless” in 2017 Beijing International Electronic Music Festival .

The work “Whispering Water” has similarities in visual imagery with the previous work, which is mainly based on abstract point, line, and surface modeling elements, but there are obviously differences in the creative techniques. This work is a pre-produced video electronic music piece, focusing on "water" as the narrative object, using metallic sound materials and some instrumental performance sounds as the creative materials for electronic music. The work attempts to express the forms and characteristics of water through completely abstract sounds. Based on the main body and sound style of the work, the work uses abstract color language and graphic image language to map multiple musical elements in the music, such as sound segments, sound forms, dynamics, spatial forms, etc. The following is a five-dimensional analysis diagram of the work:

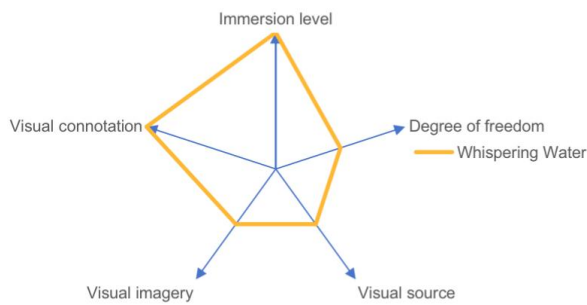


Figure 7. Five-dimensional analysis diagram of “Whispering Water”.

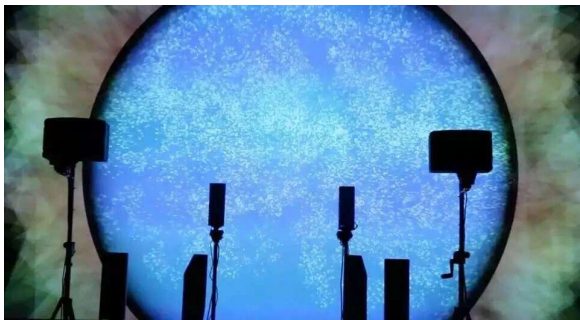


Figure 8. The performance of “Whispering Water” in ICMC.

Living Room Drama uses artificial intelligence technology, which is one of the latest creative approaches in the trend of multimedia electronic music in China. During the performance, music and visuals can interact completely, freely and in real-time. The work sets up a “virtual theater”, using artificial intelligence algorithms combined with video technology, using AI cameras to recognize objects, movements and scene locations, and realizing real-time interaction between the body and objects in the scene. In this kind of work, the visual material consists of the performer’s body movements, without specific cultural connotations, but rather a kind of referential or “command” symbols. The following is a five-dimensional analysis diagram of the work:

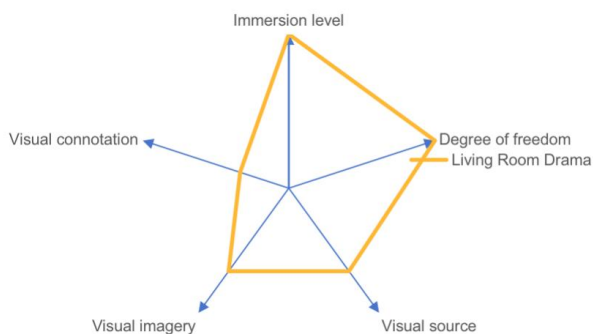


Figure 9. Five-dimensional analysis diagram of “Living Room Drama”.



Figure 10. The performance of “Living Room Drama” in 2023 Hangzhou International Electronic Music Festival .

3. CONCLUSIONS

From the above, it seems that the complexity of musical composition determines how visual are presented. The more complex the musical texture or the higher the cultural expressiveness of the visual connotation in the work, the less freedom between auditory and visual; the visual sources generated in real time are associated with abstract visual imagery, in which the visual is the referential “symbol” of the music, and changes in the techniques and elements of the musical composition can be visually presented to the listener in real-time. All in all, Electronic music, from the concrete music period, tape music period, and electronic acoustics stage focusing on creating and exploring “new sounds” as purely auditory forms of music. To the computer music period, not only continues the pursuit of “new sounds”, but also, in recent years, as everyday life becomes networked and interactive, technology as an accelerator between different media has fostered cross-boundary cooperation among various art forms. The public’s requirements for the appearance or form of art have changed to some extent, and multimedia technology is continuously used in the artistic creation of electronic music. The essence of electronic music is the art of sound, but in the new era, new environment, and under the influence of new technology, its expression as an integrated art form becomes increasingly strong. With the development new technology, our music creation ways will become increasingly affluent, and future electronic music creation and stage art will continue to extend to other art forms for cross-disciplinary integration, in retracing traditional arts, it will continuously derive new, subversive forms of musical artistic expression.

Acknowledgments

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4. REFERENCES

- [1] Zhang Xiaofu, “Review and evaluation of the development of electronic music in China,” *J. Art Review*, no. 04, pp. 27-40, 2012.
- [2] Zhang Xiaofu, Zhang Zhaoxia, Liu Yantao, “Three important categories in Chinese new media art research ” *J. Journal of Renmin University of China*, vol. 27, no. 01, pp. 44-51, 2013.
- [3] Wang Xuan, Dai Shanshan, “Presentation of Chinese electronic music audio-visual art under the fusion of immersive multiple media,” *J. People's Music*, no. 10, pp. 32-34, 2019.
- [4] Guan Peng, “Sound objects and sound symbols - On the rational perception and perceptual perception of the sound of "Acousmatic music,” *J.Huang Zhong (Journal of Wuhan Conservatory of Music, China)*, no. 02, pp. 17-26, 2010.
- [5] Zhao Xiaoyu, “Energy aggregation and radiation—the development of Chinese electronic music creation styles from the Beijing International Electronic Music Festival,” *J.Chinese Music*,no. 04, pp. 186-192, 2020.
- [6] LU Agile,JIANG Xiaoli, “A preliminary exploration of new samples of new media music in China,”*J. Contemporary Literature Forum*, no. 02, pp. 149-153, 2017.
- [7] Chen Yun. “Visual representation of visual music,” *J.Cultural Studies*,, no. 02, pp. 170-186, 2016.
- [8] Wang Xuan. *Interactive Music*. Chongqing University Press, 2010.