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Music Computer Technologies In The Formation Of A Complex Model Of The Semantic Space Of Music (On The Role Of The Sequencer In The Formation Of Figurative And Semantic Spaces)

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Abstract— The logic of computer musical creativity with the use of a sequencer as a manifestation of a complex model of the semantic space of music is the subject of this work. The importance of developing an integrated model of the semantic space of music is emphasized: a modern concept of understanding the processes taking place in the world of music and computer technologies (MCT). The concept is discussed using an example of an audio sequencer. It is the sequencer that facilitates the existence and development of musical creativity in the modern high-tech music and information space. The possibility of reconstructing the lost or creating a new musical-sound semantic space using a sequencer is analyzed. An example of recreating the semantic space of the Nanai shamanic rite is provided. As a conclusion, authors prove the reconstruction of sound semantic spaces to be appropriate. Such spaces are filled with musical symbols - timbres that combine various semantic components of a ritual action in a single semantic space of a syncretic whole. The article discusses the necessity to study the features of the use of MCT in the practice of modern composition. To solve the issue, the authors propose carrying out a multivariate analysis of the trends existing in this field. The scientific understanding of creative experience, accumulating the interaction of figurative-semantic spaces of sound, visual and other series, all participating in the process of forming a complex model of the semantic space of music, is recognized by the authors as an integral part of such an analysis.

Keywords— Music computer technologies (MCT), integrative model for the semantic space of music, sequencer.

I. Introduction

Music computer creativity is an important part of culture. Modern musicians: composers, performers, musicologists and teachers are increasingly recognizing the importance and necessity of studying and applying music and computer technologies (MCT) (Gorbunova, 2019) in their practice and the scientific understanding of cultural phenomena. As a result, there is a specific process of convergence of music and technology, the attraction of specialists and researchers from various fields of science — culturologists, philosophers, historians, mathematicians, physicists, cybernetics, psychologists, etc. There is also a need for new specialists. As noted earlier in our works, the music industry needs a new type of musicians: people who are skilled in MCT and are confident working within a high-tech informational educational creative environment. Such a specialist can become a demanded employee not only in the field of education and culture, but also in those areas where music and musical creativity are elements of a single synesthetic space (Gorbunova & Zalivadny, 2020). Disciplines related to MCT, electronic music making and computer musical creativity are actively involved in the educational process at different levels of education (Gorbunova, 2019; Belov & Gorbunova, 2015).

New methods of music research and new concepts of understanding the ongoing processes are being born. So, one of the promising directions is the development of a "complex model of the semantic space of music", proposed in 2000 by a team of authors (Zalivadny et al., 2000). In 2012 the publishing house of Herzen State Pedagogical University of Russia published a collection of articles "A complex model of the semantic space of music" (An Integrative Model for the Semantic Space of Music, 2016), consolidating the advanced developments of that time in this field.

In the works of M.S. Zalivadny and one of the authors of the article (Gorbunova & Zalivadny, 2018; Gorbunova

& Zalivadny, 2020) argue that a complex model of the semantic space of music unites different levels of musical semantics. In the different key aspects of musical logic and psychological patterns of music, various forms of musical synesthesia. The model, on the one hand, is based on a comprehensive analysis of music, which is one of the characteristic trends in musicology development, starting with the first half of the 20th century, on the other, — it is due to the use of mathematical research methods in musicology (Gorbunova, 2015). The basis of the model is formed by the "multidimensional semantic space of music. In this space, individual associations of dimensions correspond to different levels and spheres of musical semantics (including the logic of musical composition and diverse forms of musical synesthesia)", — note the authors of the article "Complex model of the semantic space of music"(Zalivadny et al., 2000).

II. Materials and methods

This paper proposes an attempt to present computer musical creativity in a sequencer within the framework of this model. The entire set of meanings conveyed by linguistic signs of a musical language forms the semantic space of this language. The semantic space of music is expressed through various linguistic signs. In the semantic space of music, we distinguish between sound (sign) and sound-semantic concepts. These are the concepts that are objectified, respectively, by musical sound (sound, timbre) or musical structures.

We noted earlier that in the practice of musicology, one of the most important areas of application of the complex model of the semantic space of music can be a complex analysis of musical works, which combines the problematic of perception and aesthetic assessment of music, which is quite complex in content and structure, and the study of the ways of existence of musical compositions and the connection of these methods with the characteristics their performing interpretation (Zalivadny, 2019).

To understand and correctly interpret a piece of music created with the help of MCT, it is necessary to rely on the technological aspects of ideas about music, the creation of musical works (including made with MCT). This is especially justified in a situation where there are very powerful, multicomponent computer sequencers, in which, in fact, some elements of the complex model of the semantic space of music are already taken into account. The sequencer acts as one of the varieties of such a model, allowing both the composer and the performer to work with it. A sequencer these days is no longer just a piece of hardware or software for recording, editing, and playing back a sequence of MIDI data. It is one of the options for the existence and development of musical creativity (in the broad sense of this concept) in the technological space and performs, in a sense, the function of synergistic coordination of timbres, styles and genres with each other.

Composing or arranging in a sequencer is a complex, time-consuming process. The requirements in modern musical culture for writing a high-quality arrangement are so high that it often leads to an active search, experiments, the birth of high-quality samples, tracks and whole compositions. The emergence of musical works created on the basis of a sequencer, which is a timbre, style, genre musical synthesis in these conditions, can be considered a modern phenomenon.

The compositions created in this way represent a conglomeration of timbres, thematicism, melody, harmonic styles, etc. With the help of MCT, the composer forms a multidimensional semantic space of music, and MCT becomes a tool for the complex analysis of musical works. Thus, MCTs serve as a tool for creating and researching the semantic space of music.

III. Results and conclusions

It seems possible to suggest a new cultural phenomenon, which is a kind of special language of musical (musical-computer) interaction and communication in space. Given the open nature of the entire complex model of the semantic space of music as a system, the aspect under consideration may be one of the perspectives that reveal this model, which has an open nature. This is a new stage in the development of communications. Based on the synthesis of various elements of language and compositional structures of music (sound, timbre, melody, harmonic features, rhythm formulas, thematism, etc.), obtained with the help of MCT, in particular, a sequencer, it expresses itself in the form of both a process and the product of interaction and creative rethinking of various elements of musical cultures.

One of the options for using the sequencer in this perspective is to recreate the lost or create a new sound semantic space. Next passages provide an example of recreation of the Nanai shamanic rite semantic space.

The Nanai belong to the Tungus-Manchu group of indigenous peoples of the Russian Far East. For many centuries, a shamanic picture of the world was formed among the natives of the Far Eastern region: “The shaman constructed a special model of the world, a kind of psycho-spiritual reality. The shamanic picture of the world, first of all, included the ethos of the tribal collective, disciplinary practice, a set of spiritual values, etc. Shamanism is a specific type of social creativity, in which aesthetic, ethical, communicative, pragmatic aspects of the collective life of a tribal society are manifested. ” (Solomonova, 2000)

Shamanic rituals were a syncretic act in which dialect, singing, all kinds of onomatopoeia, playing instruments, choreography, etc. were intertwined. According to the natives, with the help of a tambourine, a shaman could communicate with spirits, heal diseases, predict the future, learn the past, etc., expel the "evil spirit", etc. Each shaman had his own spirits-helpers, special ritual attire and attributes. Every detail of the costume, every attribute was symbolic and endowed with a certain meaning. A tambourine with a mallet, a belt with metal tube-conical pendants, metal pendants and bells on the shaman's tambourine and clothes, rattles were obligatory attributes of the shaman.

Unfortunately, shamanic rituals are now becoming a thing of the past. Rare records and stories of witnesses, scientific research — this is the little and priceless that remains today. MCTs, however, open up new opportunities for us to preserve and even restore the existence of the sound picture of the shaman rite in a new, musical-computer environment. In this case, the sequencer serves as a tool for modeling the sound semantic space of the shamanic rite: each individual instrumental track contains MIDI data, which is a kind of symbols, signs of the modeled space.

For example, the Nanai shamanic healing ritual, which was deciphered by one of the authors of this article, S.V. Mezentseva (Kamlanie of the shaman Geiker (Onenko) Gara Kisovna. Audio recording of L.G. Beldy dated February 7, 1983, village Daerga, Nanai district, Khabarovsk Territory. The authors of the article are deeply grateful to Larisa Gonzulievna Beldy for the materials provided. Translation from Nanai into Russian was executed at the request of S.V. Mezentseva R.A. Beldy.)

Shamanic healing ritual in the musical and technological space of the sequencer contains the following elements:

Track 1 — chanting of the shaman;

Track 2 — shaman's whisper;

Track 3 — the shaman's talk;

Track 4 — onomatopoeia of the shaman to animals and birds;

Track 5 — the sound of a tambourine (strikes with a beater on the membrane);

Track 6 — the sound of a tambourine (beats with a mallet on the shell);

Track 7 — the sound of a tambourine (strikes with a hand or fingers on the membrane);

Track 8 — the sound caused by the vibration of the membrane by the shaman's fingers;

Track 9 — the sound of a shaman's belt with pipe-conical pendants;

Track 10 — the sound of metal bells on the shaman's clothes;

11 track — the sound of metal pendants on the shaman's clothes;

Track 12 — the patient's voice;

Track 13 and further tracks — sounds of the environment (sounds made by a burning fire, wind, conversations and everyday noises of the "spectators" of the ceremony, etc.). All together the sounding composition forms a kind of orchestra from the “texture of separate elements” (in the words of S.M. Eisenstein) (Eisenstein, 1964).

In the final composition, created with the help of the sequencer, a work is born, the accuracy and adequacy of which in the transmission of the sound-semantic picture of the shaman rite is determined, on the one hand, by the peculiarities of the initial situation, its further development, on the other hand, by the constantly improving technical capabilities of the sequencer and professional qualifications of a musician, uniting in one person a composer, an instrumentalist and a sound engineer. (In our work, we used the Steinberg Cubase 10 sequencer, which is widely used today as a DAW (digital audio workstation).) Thus, it becomes possible to recreate sound semantic spaces filled with musical/sound symbols (timbres) that accumulate various semantic components ritual action, which is one of the manifestations of the complex semantic space of music. In addition, new possibilities for creative modeling based on folklore data are opening up. It is necessary in the very near future to

digitize, analyze, create special catalogs and "banks" of folklore data (Alieva et al., 2019). Using the endless possibilities of the MCT, the Nanai shamanic tradition has a chance to to be preserved and exist in a new format of cultural artifacts that have been lost or partially come down to us, as well as to create on its basis new style trends, including those that expand the multidimensional concept of the musical genre: see, for example, works (Gorbunova & Zalivadny, 2020) and others.

Thus, we can talk about the formation of a new structure of the musical space, formed with the help of MCT (in particular, a musical sequencer), as well as the emergence of special patterns of interaction of figurative-semantic spaces of sound, visual and other series.

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