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**THE CURRENT SITUATION, CHALLENGES, AND PATHS  
OF HIGH-QUALITY DEVELOPMENT OF GENERATIVE AI MUSIC  
FROM THE PERSPECTIVE OF RURAL REVITALIZATION**

*Abstract: this paper presents a comprehensive examination of the current state of generative AI music and the associated challenges that accompany its development. Through a detailed analysis of recent advancements, this paper also proposes potential strategies for achieving high-quality development in this emerging field. The examination focuses on three key areas: technical advancements, creative applications, and ethical considerations [13].*

*Nowadays, when technology is moving forward, it is obvious that they will penetrate into music. Currently, melodies written with the help of artificial intelligence are becoming more and more popular, and therefore the relevance of studying this problem is increasing, since it is not always clear whether the use of AI in the creation of musical works has a positive effect from the point of view of ethics.*

*The purpose of this study is to characterize and determine the place of artificial intelligence in art, and especially in musical art.*

*According to the results of the research in this article, we came to the conclusion that the use of AI in music can make the process of its creation faster and simpler, as well as more customer-oriented, but it is necessary to understand that there are limitations. For example, a machine can take away a person's job, which will lead to unemployment. The article suggests for practical significance the need to reform the existing legislation in the field of AI and establish clear boundaries of its validity.*

**Keywords:** *music, artificial intelligence, ethical issues.*

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**СОВРЕМЕННАЯ КАРТИНА, ПРОБЛЕМЫ И ПУТИ  
ВЫСОКОКАЧЕСТВЕННОГО РАЗВИТИЯ МУЗЫКИ, СОЗДАВАЕМОЙ  
С ПОМОЩЬЮ ИИ, С УЧЕТОМ РАЗВИТИЯ СЕЛЬСКОЙ МЕСТНОСТИ**

*Аннотация:* в статье представлен всесторонний анализ текущего уровня развития генеративного ИИ в музыке и связанных с ним проблем. На основе тщательного анализа последних разработок в работе были предложены возможные стратегические решения для достижения высокого качества развития новой области. Исследование сосредоточено на трех ключевых аспектах: технических достижениях, творческом применении и этических соображениях [13]. В эпоху развития технологий становится довольно очевидным тот факт, что ИИ постепенно внедряется в сферу музыкальной деятельности. На сегодняшний день, мелодии, написанные с помощью искусственного интеллекта, становятся все более популярными, поэтому повышается значимость изучения этого вопроса, так как не всегда понятно, имеет ли использование ИИ при создании музыкальных произведений положительный эффект с точки зрения этики. Цель исследования – охарактеризовать и определить место искусственного интеллекта в сфере искусства, в частности в музыкальном искусстве.

По результатам исследования, автор приходит к выводу о том, что использование ИИ позволяет ускорить и упростить процесс написания музыки, а также соответствовать запросам клиента в большей мере; при этом необходимо понимать, что существуют ограничения. Например, компьютерные технологии могут лишить человека работы, что приведет к безработице. В статье высказывается мысль о необходимости введения правок

*в существующие правила использования ИИ и установления четких границ его применения.*

**Ключевые слова:** музыка, искусственный интеллект, этические проблемы.

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*Introduction:*

Generative AI music refers to the process of using artificial intelligence algorithms to create original music. In recent years, this field has gained increasing attention from both industry and academic circles due to its potential for innovative applications in music composition, performance, and other related areas. However, as this emerging technology continues to develop, several issues and challenges have emerged that require careful consideration.

The relevance of the topic currently leads to the fact that many scientists are writing literature.

The literature on this topic can be divided into several directions at once. The authors of some works (for example, Voskresenskaya [15, pp. 67–70], Solovyova [14], Razin [12, pp. 57–73], etc.) believe that ethical issues in the use of music creation are currently very acute, and there are still very few laws regulating them. It seems that frequent scandals on this ground are a confirmation of their words. Researcher Haase-Rapoport [2] believes that artificial intelligence is designed to solve the problems of humanity, and therefore it helps to develop means of communication, and any of its limitations, even in music, will have a bad effect on the development of scientific research in AI, and this is dangerous for progress.

The same opinion is shared by art historians Y. Ovchinnikova [7, pp. 46–64] and L. Nagornaya [6, pp. 32–43], who believe that the development of the use of AI in music creation has advantages. In general, scientific works that deal with the development of AI in art and music have often appeared in science in recent years, as the topic is relevant for our technological age.

The relevance of the topic is dictated by the sharpness of contradictions and disputes, because in the scientific field and even among ordinary people, the issues of the relationship between ethics and art remain unresolved. Even with regard to legal methods [3].

Despite the fact that the current state of the scientific literature on the topic is quite good, it is important to understand that there are still little-explored issues, for example, questions of finding the role of AI in music. In our study, we will try to characterize this place, highlighting the pros and cons of using AI.

#### *Materials and Methods:*

This work will be written on the basis of the principles of objectivity. scientific methods of synthesis, analysis, classification, induction and deduction are used. The historical-genetic method is used as special methods.

The purpose of this study is to characterize and determine the place of artificial intelligence in art, and especially in musical art. To achieve such a goal, it will be necessary to solve a number of tasks.

Among them we can mention.

1. To trace the formation of AI in the genre of musical melodies.
2. Consider the problems that exist in this area at the present time.
3. Develop examples and strategies for solving these problems in the ethics of using AI.

#### *Results:*

It is necessary to divide the work into parts in accordance with the tasks listed above.

#### *Section 1: Status Quo of Generative AI Music.*

This section provides an overview of the current state of generative AI music [11], detailing its evolution and diverse applications in music production, composition, performance, and other areas [8, pp. 198–203].

Before you start composing, the neural network learns. The programmer feeds it with a large number of musical MIDI tracks so that the AI detects patterns between sounds. Based on these very patterns, the computer brain generates something new.

There are two options. First: the machine listens to a piece of music, and then tries to reproduce it – so that it is as similar as possible to the original. Second: the computer hears one note and tries to predict the next one based on its listening experience. On average, 9 out of 10 melodies written by a neural network sound like a cacophony. But the remaining 10% is pretty acceptable. However, they become full-fledged compositions only after a person takes care of the processing. But the composer machine cannot do without us yet [1].

When creating a melody, artificial intelligence gets the functional scheme of the music. For example, you can see what the functional diagram of the initial fragment of the «Moonlight Sonata» by Ludwig Beethoven looks like [4, 19].

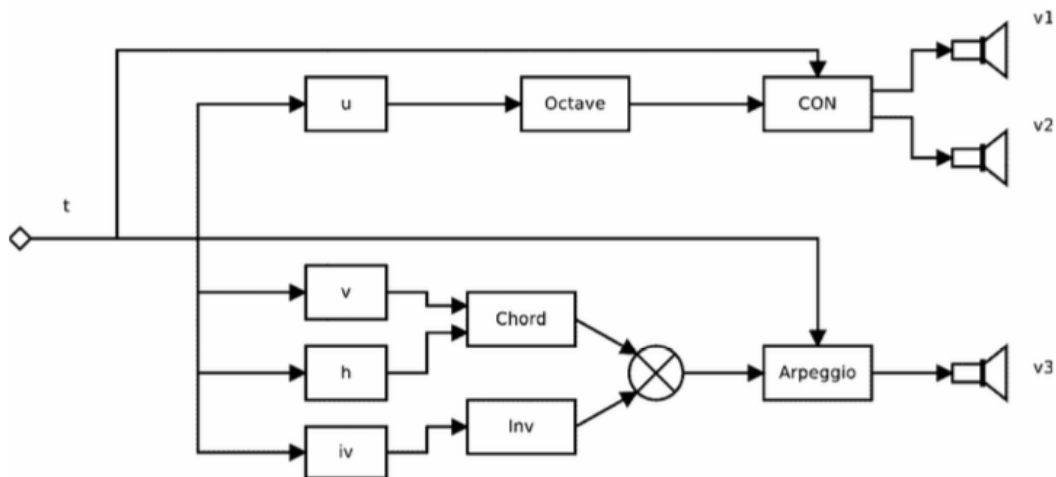


Fig. 1. Functional diagram of the initial fragment of L. Beethoven's «Moonlight Sonata». A source: Kuznetsov A. Functional representation of music and approaches to structural synthesis (2012) J Computer Science, Telecommunications and Management

In 2019, the record company Warner Music for the first time signed a contract to create music using algorithms with the founders of the German service Endel. Endel's prolific algorithms have released 20 albums with relaxing melodies. Each disc has a «weather» and mood, just read their names: «Stressful cloudy morning», «Relaxed summer evening», «Clear night».

The Endel system is based on audio tracks written by Dmitry Evgrafov, composer and co-founder of the application. And, in addition to ready-made playlists, Endel

offers each user music that is automatically written specifically for him, collecting samples and tracks as a constructor. The system analyzes data about a person, for example, the pulse rate measured by a smartwatch, and then correlates them with external factors – the time of day, the weather outside the window and location. As a result, the AI writes the perfect «soundtrack» for any activity. This is an absolute plus of AI in music, because it simplifies the creation of a melody, because the composer would write a melody several times longer and would not adjust to the preferences of all listeners [14]. AI can do it.

The use of AI in music has its advantages.

### *Section 2: Challenges of Generative AI Music.*

This section delves into the various challenges associated with the development and implementation of generative AI music. The paper also highlights the need for more comprehensive evaluation metrics to fully assess the creative and aesthetic value of AI-generated music.

The development of AI opens up broad prospects in many areas of human activity, however, it is associated with a number of ethical and moral issues. One of these ethical issues is related to the use of AI to create and analyze media content, including music. There is a problem of defining the boundaries beyond which AI developers artificially create content that violates the moral norms and values of society. One example of the use of AI in music creation is the analysis of songs, where images and references to historical figures such as Hitler are used. Images of Hitler and Nazi Germany are associated with war, violence and genocide, and cause extremely negative emotions in the minds of most people. The use of Hitler's images in music, especially in modern genres, can violate moral boundaries and cause a negative reaction from listeners. This raises questions about the appropriateness of using AI for such purposes and requires a discussion of morality [10].

However, not all scientists believe that the problem of ethics regarding the use of artificial intelligence in music is so acute.

Thanks to new technologies, the level of entry into the profession is decreasing, which leads to an increase in the supply of high-quality music on the market. The

consumer gets a variety of music, which he will also be able to assemble for himself and his mood. Isn't that what music is for? Of course, it must be said here that the function of music as a medium for transferring information from one person to another is lost, the emotions of a specific, living artist are lost. But that's why the author's, natural music will not die. How acoustic instruments did not die when electronic ones appeared. In addition, it should be remembered: AI does not yet feel the audience, does not know how to take into account trends and invent something new based on the spirit of the times. Nevertheless, the Institute of Sound Design in USA is developing on the principles of creating generative music with universal rules [14].

In general, the problems of ethics in relation to AI and music can be characterized as follows: 1) the problem that AI can replace live musicians, which will lead to unemployment; 2) AI cannot always understand moral norms and create works with provocation; 3) AI creates similar products, which raises concerns that music will continue to develop.

### *Section 3: Strategies for High-Quality Development of Generative AI Music.*

This section proposes potential strategies for achieving high-quality development in generative AI music. These strategies include [3]:

1. Clearer control over the work of AI by programmers and employees.
2. Development of a system of international legislation regarding the use of AI so that machines cannot completely replace the work of people.
3. Stimulate the creativity of human musicians so that there is no reason to resort to AI.

This situation implies the need to intensify national research work on ethics in the field of AI and promote its results to the international level. This will make it possible to more effectively defend the achievements of philosophy, increase its relevance in international scientific communities and organizations. The involvement of representatives of Russian technology companies in such studies and the building up of experience in the development of targeted ethical guidelines for various purposes will also create favorable conditions for the promotion of products worldwide [12, pp. 57–73]. The potential for the development of national evidence-based approaches to ethics in the field

of AI largely depends on the creation of creative, interdisciplinary teams, well organized and administratively managed [5, pp. 124–140].

*Discussion:*

Let's turn to the opinions that scientists have.

O. Peredelkina believes that AI in music has its roots since the twentieth century [9]. We came to similar conclusions as a result of the research in this article.

As already mentioned, the issues of the relationship between ethics and AI are very complex. Among the advantages of using AI in music, scientist Kuznetsov also believes that the representation of music using functional circuits opens up new opportunities for the analysis of musical compositions for both engineers and programmers, giving the opportunity to practice functional programming, which is considered the basis of artificial intelligence [4, pp. 11–20].

However, we dare not fully agree with this statement of the question. Despite the fact that AI has a number of advantages, as Kuznetsov has already pointed out, nevertheless, its activities should be strictly regulated, because it can violate ethical norms. In this regard, it seems acceptable to agree with the opinion of Nagornaya and Ovchinnikova.

*Conclusion:*

Thus, it is possible to summarize the conclusions in a thesis.

1. Generative AI music has great potential for revolutionizing music creation and production processes.

2. It is important that music created by artificial intelligence is created much faster than when written by a living person. This simplifies the process. AI also adapts to the needs of a specific person who wants to get a melody, and a live composer would not be able to create so many melodies so quickly, because he has time constraints, the need for rest, as well as personal tastes in musical art.

3. Thus, AI in music has its advantages, but it is important to remember that there are also big disadvantages. Researchers usually say that AI can take jobs away from talented people who write music, which will lead to structural unemployment. AI can not always create high-quality music, often it gives out just a set of sounds. AI does



not understand the ethical requirements of humanity and may violate them, which people may not like. Here we can recall the example of A. Hitler and AI, it was written about above.

4. However, to achieve high-quality development in this field, it is crucial to address the various technical, creative, copyright, and ethical challenges that accompany its development.

The proposed strategies provide a framework for overcoming these challenges and unleashing the full potential of generative AI music.

This article says that it is important to develop research on AI, as well as to develop legal laws that would regulate this area of activity. It is important that the AI does not become unmanageable. AI should be a human assistant to give free time, but should not become a substitute for humanity, because creativity is a process that applies only to a person, not a machine.

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