

The Subjectivity and Conformity Issues in Contemporary

Practices of Algorithmic Creativity

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Abstract

This article examines the issue of subjectivity and conformism in algorithmic cultural practices (robotic performances and neurocomputer installations “A3 K3 Dragan Ilic,” “Alone Together,” “NOOR” and “AIBO”). The focus is on the technological features of algorithmic creativity, which is based on machine learning, stylistic imitation and computational data processing. In this context, ethical and legal issues related to copyright and the recognition of artistic works created by artificial intelligence are analyzed. In particular, mechanized artistic practices create the illusion of autonomous creativity, whilst retaining the decisive role of human subjectivity in the organization and interpretation of cultural processes. Algorithmic creativity remains dependent on human programming, technological mediation and artistic conception. However, the creative process involving BCI may take on characteristics of subjectivity. This is evidenced by court rulings on the determination of subjectivity and copyright in works created through algorithmic computations.

Keywords: *Algorithmic Creativity, Robotic Performances, AI, Conformity, Brain-Computer Interface, Authorship*

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Introduction

The Fourth Scientific and Technological Revolution, characterized by the rapid development of algorithmic computational methods, has swept across the globe and had a significant impact on artistic culture and the definition of its subjectivity. With the invention and refinement of computer technology, human activity is increasingly being replaced by mechanized processes. These innovations have not bypassed the spatial arts either. It is not a question of the disappearance of the creator's noumenon in artistic production, but of the viewer's participation in the immediate process and the automation of production activities.

Therefore, in the course of this research, it is important to analyze contemporary experience in the development of robotic mechanisms and their use by artists in organizing creative activities. These practices have contributed to the formation of a new specificity of the cultural process, which shapes scientific thinking and advanced methods of creating interactive art. These transformations raise ethical and social questions regarding the role of technology in artistic culture, the freedom of the artist, and the interpretation of works within the relevant organization of creative activity.

Theoretical Foundations

In our time, in an era of industrialization across all spheres of activity – accompanied by standardization, unification and the suppression of creative impulses – the creative individual is transformed from a biological being into a purely social one. After all, collective forms of organizing the creative process tend to turn into a routine production process (Goncalo and Barry, 2006:97). With the introduction of AI into contemporary cultural studies, conceptual research into “algorithmic creativity” and the autonomous generation of artistic content has become highly relevant (Pearce, Meredith and Wiggins, 2002; Colton and Wiggins, 2012; Lucchiari, Folgieri, Cas and Soave, 2016; Andujar, Crawford, Nijholt, France and Gilbert, 2015). These attempts to understand “algorithmic creativity” are accompanied by critical academic research, which highlights the impossibility of replicating biological systems in terms of their structure and functioning (McCarthy, 1987:1030-1035). In algorithmic creativity, aesthetic content can be generated autonomously through the operation of computational models (Ames and Domino, 1992: 186; Pearce, Meredith and Wiggins, 2002:119-147). In this context, the main focus is on the minimisation of the role of human activity in the organization of artistic creation; consequently, the risks of losing control over the process of creating an aesthetic product are examined (Sangvanich and Phetmalaiikul, 2024:270).

These issues are relevant in the concept of “technological singularity” (Good, 1965; Drexler, 1986; Vinge, 1993:11-22), according to which a robotic device is capable of functioning without human programming (control). This leads to the illusion of equating human intelligence with “artificial” intelligence. One of the main topics of discussion regarding the conceptualization of artistic culture arising from the use of algorithmic computations is the question of authorship and creative uniqueness. C. Lucchiari, R. Folgieri, L. Dei Cas and F. Soave (2016) investigate the interaction between mechanized and human actions in the organization of the creative process. The main limitation of these approaches is the use of an invasive “brain-computer” interface to control the device. In cultural studies, critical statements and concerns prevail regarding the negative impact of “artificial intelligence” on the formation of artistic culture (Chen, Shidujaman, Jin and Ahmed, 2020:13-31; Yusa, Yu Yu and Sovhyra, 2023:153-154).

Most scholars argue that the cultural practices of introducing “artificial intelligence” do not indicate genuine “authorship” on the part of mechanized technologies, since they ultimately turn out to be the product of human programming and training data (Hofstadter, 1999: 83–91), because AI can only imitate existing styles and is incapable of originality and creativity (Janjanam, et al, 2022:1425-1433). The issue of understanding the introduction of “artificial intelligence” into creativity is based on the assertion that computational systems mimic human behavior.

Scientists agree that there is still no AI technology that is self-aware, independent, and able to cope with emotional and social effects (Hadzi and Roio, 2020:1-18). Instead, J. Litman points out that “copyright laws become obsolete when technology renders the assumptions on which they are based obsolete” (Litman, 2006:22). S. Ligon argues that if we recognise the originality of AI-generated products, it means that we should raise the question of the subjectivity of artificial authors (Ligon, 2019:51). Depending on the level of automation in creative activities, the following types of user control can be identified: selective control, passive control, direct control and collaborative control (Wadeson, Nijholt, Nam, 2015: 70-75). Based on their technological developments, the authors propose a definition of “brain-computer” artistic interfaces according to four criteria: “human-computer” interaction, neurophysiology, art and computer technologies (Andujar, Crawford, Nijholt, France, Gilbert, 2015:60-69).

Research Methodology

In order to explore the issue of creative subjectivity in the organization of robotics practices, the article considers both technocentric conceptual views on the process of organizing creativity (which are predominantly expressed in the conceptual sphere of “technological determinism”) and anthropocentric approaches to understanding artistic culture (as established in posthumanism and transhumanism, as well as in the theory of technological singularity). The artist’s technological individualism is manifested in an original approach to the organization of the creative process. According to the concept of creativity proposed by R. Folgieri, M. Granato, C. Lucari, and D. Grechi (2014), “the artist’s idea approaches a state of consciousness,” but the human mind only begins to realize the process of the creative realization of this idea only when the task of technological implementation arises. As a result, divergent thinking (author’s thinking involving a large number of non-standard, original solutions) is often replaced by canonical thinking (an established set of generally accepted techniques and technologies of creative activity). The increasing complexity of the technological component of the creative process – in particular, automation – alters the nature of artistic creation, its style and the results of production. To address the research objectives, a comparative-typological method was employed to compare human and mechanized activity, as well as to determine the level of conformity in robotic practices in light of the identified technological determinism. We propose a method for analyzing the complex psychological ultrastructure of the creative process, which enables the investigation of signs of subjectivity and authorship in the organization of cultural creation processes.

This technological representation algorithm of the artist’s idea is an important issue that depends not only on determining the technical and technological component role, but also on the subjective feature of the artistic cultural process. After all, despite all the uniqueness and originality, the creative process is built according to a certain logic: from the

moment when its image is born in the artist's imagination, to the moment of embodiment, (embodiment) in a certain material, and then – the search for its completion in the minds of consumers, which is a complex art psychological ultrastructure (Bezklubenko, 2015:229). This process of technological implementation of the artist's vision is a crucial issue that depends not only on defining the roles of technical elements, but also on the subjective nature of the creative process. After all, despite all its uniqueness and originality, the creative process follows a certain logic: from the moment the image is born in the artist's imagination to the moment of its realization (materialisation) in a specific medium, and then – the search for its completion in the minds of the audience, which constitutes a complex artistic and psychological superstructure (Bezklubenko, 2015:229).

In the case of the automation of the creative process, the creator's idea is realized using technical tools, algorithmic data analysis, and complex mathematical calculations. Consequently, it becomes difficult to analyze the psychological superstructure of the creative process and to compare the creator's original idea with the realized variant. This issue becomes crucial in the course of the research and requires the resolution of a number of significant problems related to the determination of authorship, subjectivity and the conformity level.

This finding also leads to a further intensification of technophobia, the consolidation of the "technological singularity" theory, and subsequently the "Uncanny Valley" theory (Mori, 2012:98-100). The latter aims to explore human reactions to the realism of an artificially created object as it comes closer to a real-life counterpart. M. Mori argues that as a robotic mechanism becomes more human-like, observers' emotional reactions become more positive, but this lasts only until the robot's appearance becomes increasingly indistinguishable from that of a human. A sense of anxiety is likely a form of human instinct that protects against immediate sources of danger (Mori, 2012: 100). This concept is important in the research of the role of technology and engineering in the organization of artistic creativity, as its propositions illustrate the contemporary understanding and perception of technical innovations in the organization of artistic creativity by the audience.

The Conformity and Technological Determinism Problem in Automated Practices of Organizing Artistic Creativity

Contemporary technological attempts to mechanize the creative process and integrate computer technology into cultural practice are undertaken with the aim of optimizing labour and saving time and resources. These processes lead to the organization of factory-style production of cultural works. This does not refer to the factory production of consumables for the creative process (in visual arts –paints, brushes, stencils; in sound reproduction – musical instruments, etc.), but to a fully mechanized creative process. Robotics is generally used to perform complex operations in production. The coiner of the term "artificial intelligence," J. McCarthy, once emphasized that: "the capabilities of modern technology exceed human capabilities" (McCarthy, 1987:1030).

Given the importance of a creative approach in the organization of artistic creation, the collective nature of such activity may have certain negative consequences. In particular, artificial creativity, compared to individual creativity, exhibits a higher degree of conformism. Working independently, an artist can easily adapt methods and techniques to suit

an idea, leading to the development of a distinctive style and manner of execution. In an automated creative process, all participants must “subordinate” themselves to the common goal. Consider examples of a hybrid combination of mechanized and human activity directly within the production process, including the scanning of brain activity and human thought, as well as the subsequent execution of mechanized manipulations in accordance with the results obtained. In particular, in the installations “A3 K3 Dragan Ilic” (Kreutzer and Sirrenberg, 2019:219), “Floor” and “Living Fool” (Colton and Wiggins, 2012:21-26) robotic mechanisms create so-called “pictorial” canvases.

At the Ars Electronica festival (Linz, Austria, 7–11 September 2017), a demonstration was given of the A3-K3 mechanism (a Kuka robotic mechanism), which made it possible to “draw” a picture mechanically. This means that the robot creates the image that the user has in mind and intends to draw, without making any physical movements. This is achieved by monitoring the user’s mental state in order to modify the operation of the robotic device (Fig.1). This process is made possible by a “brain-computer interface” (BCI), which is a method of direct interaction between human activity and a computer. The brain-computer interface measures brain activity and converts the recorded data into corresponding control signals for BCI applications (Graumann, Allison, Pfurtscheller, 2010:1–27).

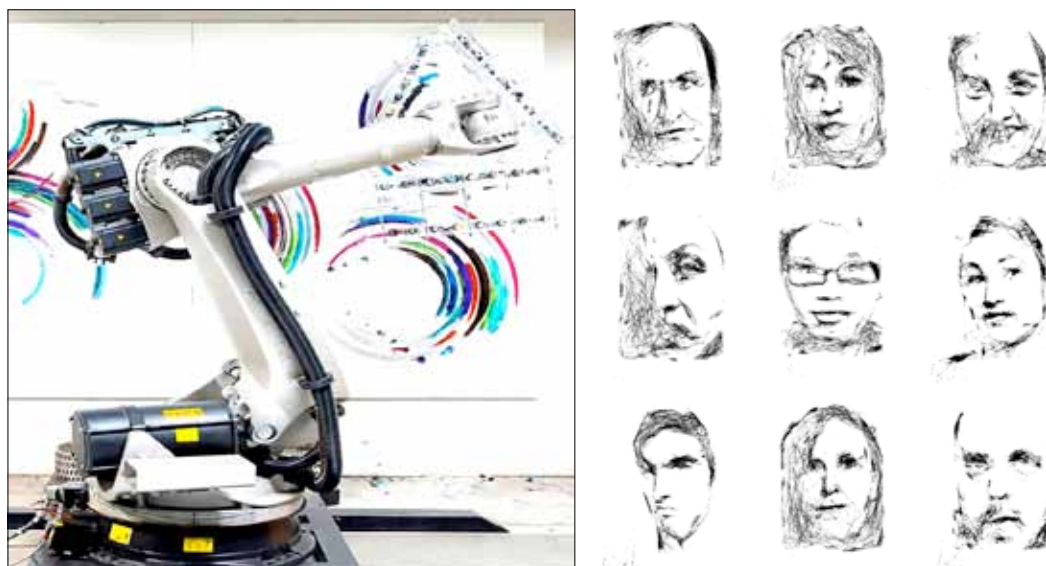


Figure 1. Functioning of the robotic mechanism A3 K3, installation by Dragan Ilic (2017).

Figure 1 shows that robotic movements mimic human activity in such a way that they appear to completely replace manual manipulation with mechanized actions. The user does not perform any physical actions; the creative process is carried out exclusively by the mechanized arm. Thus, human interaction with the robot is aimed at finding new mechanized ways of realizing the author’s vision. The proposed robot architecture is capable of recognizing users’ mental states based on biofeedback derived from their focus of attention. During the festival, the robotic system was demonstrated twice a day. In total, there were ten performances, each lasting thirty minutes, and on average the Kuka robotic manipulator received more than twelve commands per test. These commands could be programmed using two main methods: via a manual programming system and an automatic programming system using simple specialised commands (Biggs and MacDonald,

2003: 1–3). A hybrid approach to the production process (combining human activity with the operation of robotic equipment) enabled creative activity based on brain-computer interaction. According to the results of a survey of visitors to this impressive installation, only twenty per cent of respondents had prior knowledge of the Kuka robot and the possibility of robotizing the creative process, whilst seventeen per cent were aware of the brain-computer interface.

However, personal attitudes towards the installation were positive, as over fifty-nine per cent of respondents considered it possible to use a robotic mechanism to facilitate artistic creation and recognized the built-in brain-computer interface as a useful technology. More than sixty-five of respondents considered the performance to be innovative, and over forty-nine per cent found the interaction between the robotic mechanism and the artist to be organic (Tramonte, Sorbello, Guger and Chella, 2019). It can therefore be concluded that the automation of the creative process has reached such a level that the human hand is no longer required in the process of painting: canvases are now successfully painted using robotic mechanisms. It is important to note here that a robot is a technological system which, thanks to the integration of sensors and actuators, exhibits conditionally autonomous behavior in the physical world. Given that the process of performance (whether music or painting) is carried out by imitating traditional human techniques, a mechanically reproduced work of art cannot be regarded as an original work from the primary source. For example, on stage at the Norwegian Academy of Music as part of the EPARM Conference “Alone Together” (9 April 2026), a mechanized piano “accompanied” the solo violinist (Figure 2).



Figure 2. Functioning of the a mechanized piano, EPARM Conference “Alone Together” (9 April 2026).

Despite the originality of the mechanization process, music remains material for the listeners' perception. At the same time, the instrument, like the performer, merely reproduces the recorded score. Thus, by imitating traditional human technique, the illusion is created that the musical sequence arises through the instrument's action. In reality, however, the opposite is true: musical compositions, as the result of traditional music-making

techniques, dictate the algorithm for their reproduction to mechanized technology. These findings raise questions about the importance of improvisation and the author's approach to the choice of techniques and technologies for organizing artistic creation. The author's style, inherent to the individual artistic process, is transformed into a clearly planned method for calculating mechanized manipulations. It is therefore important, in the course of this research, to identify mass-produced works that are unique, one-of-a-kind, and which can rightly be called works of art. This raises the question of authorship, for if creativity can now be reduced to a purely mechanized process (as noted above), then the significance of human activity risks being downplayed. Given the identified patterns of the industrial transformation of the creative process, it is extremely important to investigate the issues of authorship and the uniqueness of the results of this activity. The possibility – or, conversely, the impossibility – of fully mechanizing creative activity and determining the role of human activity in the relevant process are the next questions for further research.

Copyright and the Illusion of Authorship in Algorithmic Creativity

The integration of artificial intelligence into the field of stage entertainment creates significant ethical issues. One of the key issues is the balance between the role of AI-generated content and human artistic expression. While artificial intelligence can facilitate and extend creative processes, it is important to preserve the authenticity and emotional depth that identifies human experience and interpretation. The "Izolyatsia" Foundation and the "IZONE Creative Association," with the support of the US Embassy, organized the "Incubator" project (2014–2020) with the aim of familiarizing specialists and artists from around the world, particularly from Ukraine, with the results of technological developments in the field of "artificial intelligence" in the cultural sphere (Sovhyra, 2021:9). The "NOOR" and "AIBO" projects (directed by Ellen Perlman) are based on tracking brain activity and incorporating artificial intelligence into the artistic space. "NOOR" was presented in a 360-degree immersive theatre. Audience members interacted with the performer, observing her brain waves, various videos and sounds in real time. Data is captured from the human brain, undergoes pre-processing, resulting in the creation of an electroencephalogram: facial features and emotions are transformed into a specific algorithm. The resulting digital indicators are subsequently transformed into a specific artistic and visual medium (light, color, animation, sound, music, and, with the help of more complex and voluminous clouds, heat, vibration, etc.).

The artist can walk around the audience and interact with other people. Video generated from the performer's brainwaves is projected onto screens, whilst the music and soprano vocals also change in response to the actress's emotional state (Perlman, 2017:79-85). This project demonstrates the potential for interconnection between artistic content and innovative digital technologies, art and science. Unlike "NOOR," the data obtained is processed and transformed into color images, dynamic videos and audio. Depending on the actress's emotional state, the costume reflects green colors (positive emotions – joy, laughter, interest), red (negative – disappointment, nervousness), and yellow (neutral – calm). At the same time, these detected emotions "trigger" a database containing pre-recorded video clips and vocals. This experimental project serves as a prime example of "computational creativity," organized through the operation of computational systems to represent creative ideas. "Computational systems that produce this (artistic) material can also introduce aesthetic innovations, justifying and utilizing the results of scanning" (Colton and Wiggins, 2012:23).

Based on this, artistic algorithmic creativity is largely grounded in the exploration of human works, which amounts to a simple imitation of a particular human creative style.

Experimental practices of automated creativity raise the issue of copyright. All legal norms and doctrines relating to creativity, originality, personality, economic and moral rights, limitations and exceptions are created and regularly redefined to meet the challenges of the times. Copyright is infringed in relation to works created by machine learning, a special type of artificial intelligence that “can mimic human learning and action by autonomously processing data (involving) algorithms, or sets of rules, that progressively improve themselves by feasting on data.” The question arises whether these works of art can be copyrighted and who will own these rights (Ramirez Caminatti, 2023:13).

Recent case law suggests that a computer cannot be an author. Under current U.S. intellectual property law, machines are not recognized as natural persons capable of copyright. The Compendium of the United States Copyright Office Practices regulates some of the rules and concepts derived from the above case law examples. Compendium section “The Human Authorship Requirement” illustrates anthropocentric approaches to the definition of copyright, noting that the law recognizes “work of ‘authorship’ a work must be created by a human being. Works that do not satisfy this requirement are not copyrightable” (U.S. Copyright Office, 2021: § 313.2). In April 2021, the European Commission proposed the first EU regulatory framework on AI. It states that AI systems that can be used in different applications are analyzed and classified according to the risk they pose to users. Different levels of risk will mean more or less regulation. According to Gabriel Hallevy’s theory, subjectivity in AI-enabled practices should be determined by three legal models. The first is the model of liability “committing a crime through another person,” which imposes liability on a person. The second is the natural – probable – consequence model, which holds users and developers of AI liable if they knew that a criminal offence was a probable consequence of their use or programming. The third is the direct liability model, which directly imposes liability on the AI system if it satisfies the physical and mental elements of the crime (Hallevy, 2010). Bringing to justice the developer of the neural networks used to commit the crimes is problematic, as “certain technologies used in the development of AI can be created many years before such AI is developed” (Gurkaynak, et al., 2016:754) and could not foresee the likelihood of the respective outcomes.

In addition, the EU Resolution emphasizes the importance of raising the level of software that controls robotic mechanisms, which “turns them into something more than mere tools and makes the usual rules of liability ... insufficient” (European Commission, 2021). Accordingly, it is proposed to grant the most complex robots the legal status of electronic persons. So, the copyright issue is actually resolved between those who developed the machine or technology that created the product.

Similar issues have been discussed in the UK Court of Appeal, the Court of South Africa and the Australian Court of Appeal in the lawsuit filed by researcher S. Thaler to recognize AI as the inventor of a patent. The inventor filed patent applications with the “Intellectual Property Office” in 2018 to recognise the Dabus algorithm as the inventor.) This computer-generated image was created entirely by an algorithm called Creativity Machine (Ramirez Caminatti, 2023:15). The UK Court of Appeal rejected the claim, noting that the subject of

creativity must be a person (Bonifacic, 2021). Judge E. Laing wrote in her decision: “A patent is a legal right and it can only be granted to a human being.” Lord Justice Arnold noted: “it is clear that, on a systematic reading of the 1977 Act, only a person can be an ‘inventor’” (Bonifacic, 2021).

Instead, positive decisions in favour of the plaintiff researcher were made by the judicial panels of the Court of South Africa and the Australian Court (July 2022). The latter ruled that Dabus has the rights of an author and inventor. The US District Judge Leonie M. Brinkema partially upheld the decision, writing: “As technology advances, the time may come when artificial intelligence reaches a level of sophistication that will allow it to meet the generally accepted concepts of invention” (Ibid). J. Jefferson noted: “Until a machine can write a sonnet or compose a concerto by the thoughts and emotions it feels, and not by the random fall of symbols, we cannot accept that machine activity is equivalent to brain activity.” (Jefferson, 1949:1105-1110).

This case demonstrated an excellent understanding of the AI deterministic role in the creative activity organization. On the one hand, AI technology is regarded as a formative and generative factor in the organization of the artistic and cultural process. On the other hand, the results of AI functioning are downplayed in every possible way in order to emphasise the role of humans in the contemporary process of algorithmic creativity. “Artificial intelligence programmes will never, no matter how far computer science develops, be able to provide the kind of conceptual understanding that is characteristic of human consciousness” (Penrose, 2016:18).

Despite the vast potential for automating the creative process, it is important to note that “artificial intelligence” is programmed by humans according to a specific algorithm, and therefore cannot function without their involvement. In the context of organizing algorithmic creativity, the interactive art environment becomes more human-centred, and the process of interaction becomes more intellectual. This refers to the creative application of artificial intelligence technologies in human activity. For example, the renowned British artist, musician and “cyborg activist” N. Harbisson had a technological antenna implanted in his body. The artist was born with achromatopsia, or complete color blindness. N. Harbisson considers his natural way of perceiving the world an advantage, although he would dream of being able to comprehend dimensions of vision that go beyond the visible spectrum (Sovhyra, 2021: 11). Thus, in the context of algorithmic creativity, the role of the viewer in interactive art has undergone a radical transformation: he (viewer) is no longer an external observer in the traditional sense, but become a participant and a creator.

Conclusion

The research examined algorithmic creativity as a form of mechanized production process, organized through machine learning and the identification of stylistic imitations of traditional practices. The assessment of the algorithmic creativity aesthetic can be subjective, as what is considered beautiful or aesthetically pleasing may vary from person to person. However, algorithmic creativity should not be interpreted as a completely autonomous process. It also identified four types of creative process organization practices depending on the degree of interaction between artists and robotic systems:

1. Practices in which robotic mechanisms become “agents of creativity,” i.e. capable of generating creative content during the organization of the artistic process. Examples in this context include the immersive performances “AIBO” and “NOOR” (2019), in which

data on a person's psycho-emotional state, obtained through algorithmic analysis, is transformed into a form of artistic expression.

2. Practices involving equal interaction between robotic mechanisms and artists. Through machine learning, robotic mechanisms can "adapt" to new circumstances, and thus, in this form of "collaboration" between human and robot, the illusion of "improvisation" arises through the variable reproduction of actions to perform a programmed task (installations "A3 K3 Dragan Ilic," "Floor" and "Living Fool").
3. Practices in which devices serve as a means of metaphorically representing the relationship between machines and humans (the installation "Alone Together").
4. Practices involving the use of robotic devices as "neuroprostheses," extensions of human limbs and "intelligence" (as in the case of N. Harbisson's technological antenna).

The use of mechanized and robotic systems in the organization of the artistic and cultural process raises questions regarding the role of the artist. The automation of cultural creation leads to a reduction in the artist's participation and a weakening of their authorship. Conversely, the findings of this research allow for a strengthening of the position of subjectivity in the practices of algorithmic automated creativity. Firstly, the interactive artistic environment becomes more human-centred, and the process of interaction becomes more intellectual. Thus, the role of the viewer in algorithmic creativity undergoes a radical transformation: the viewer is no longer an external observer in the traditional sense, but rather becomes a participant and creator. Secondly, the facts examined regarding legally approved decisions on the possibility of recognizing AI as an inventor did not provide sufficient grounds for the proper recognition of its authorship. The examined facts regarding legally approved decisions on the possibility of recognizing AI as an inventor did not provide strong grounds for the proper recognition of its authorship. Therefore, it should be noted that patent rights can only be granted to a human subject of creative activity. The creative process involving BCI (a combination of a human author and AI) may acquire signs of subjectivity. Since courts have rejected the possibility of granting copyright to artificial intelligence and other non-human entities, the combination of a human author and AI may acquire signs of subjectivity.

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