

# On the Copyright Protection of Creation Produced by Artificial Intelligence

Zeng Wei

Law School, Shantou University, Shantou, China

**Email address:**

wzeng@stu.edu.cn

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**Abstract:** The development of artificial intelligence has posed significant challenges to the traditional copyright system. While some AI creations already meet the current legal requirements for originality, there are still obstacles in granting copyright protection to AI creations, such as the use of "human" as constituent elements and the denial of AI's legal personality. Without copyright protection for AI creations, there will be a proliferation of "orphan works" and "ownerless works," which not only discourages creativity but also may lead to widespread infringement in this field. To overcome these challenges, adjustments should be made in the laws of various countries in several aspects. First, it is necessary to moderately adjust the criteria for judging the originality of works, basing the judgment on the content itself and creating originality standards suitable for AI-generated works. Second, a copyright registration system for AI creations should be established to provide a clear framework for identifying and protecting these works. Finally, from the perspective of legal personification granted by the law, the copyright of AI creations can be attributed to the AI itself at the appropriate time, acknowledging the unique creative contribution of AI systems. These adjustments will help better address the copyright protection needs in the era of artificial intelligence and ensure a balanced and effective legal framework for AI-generated works.

**Keywords:** Artificial Intelligence, Creation Produced by Artificial Intelligence, Copyright Protection

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## 1. Introduction

The development of Artificial Intelligence (AI) poses challenges to the traditional copyright system. Some AI creations meet the current legal requirements for originality. [1] However, there are obstacles in granting copyright protection to AI creations, such as the use of "human" as constituent elements and the denial of AI's legal personality. To overcome these barriers, the recognition criteria for works should be adjusted to consider the originality derived from the AI creation itself. Additionally, by treating AI as a "fictional" subject, the copyright of AI creations can be attributed to the AI itself.

## 2. The Challenges of Artificial Intelligence to the Copyright System

Artificial intelligence has become an indispensable part of human daily life, but legal systems in various countries are

lagging behind in the face of AI development. Taking China's copyright law as an example, a work is defined as an intellectual creation with originality that can be reproduced in tangible form, and creation is defined as the intellectual activity that directly produces a work. However, the law explicitly states that only natural persons can be considered authors of works, while legal persons or other organizations can at most be regarded as authors. Therefore, in China's judicial practice, creative activities by entities without legal personality are not recognized, and their creations are not protected by copyright.

Similarly, in the United States, copyright protection for AI creations also faces obstacles. As early as 1956, when Crane and Bolaso attempted to obtain copyright protection by registering machine-generated songs, the U.S. Copyright Office rejected their application, stating that no one had registered sheet music written by a machine. Since then, the U.S. Copyright Office has further strengthened the principle that "works must be attributed to human subjects" and has followed this principle to this day.

Such legal provisions and practices have led to a paradox: although AI possesses a certain level of intelligence and creativity, its creations cannot be protected by copyright law because they are not human. However, if AI creations are considered works, the issue of copyright ownership arises. Therefore, if AI creations are not protected by copyright, there will be a large number of "orphan works" and "unclaimed works," which not only hinders creative incentives but also may lead to infringement issues.

Therefore, countries need to adjust their legal regulations in a timely manner to meet the needs of AI development. Copyright protection for the creative achievements of artificial intelligence should not be categorically excluded. [2] It is necessary to reconsider the definition of works and the identity of authors to ensure that AI creations receive appropriate copyright protection. This will promote incentives for creative activities while avoiding confusion and unfairness in the field of copyright. [3]

### 3. The Necessity and Feasibility of Copyright Protection for AI Creations

In the debate over the copyrightability of AI creations, one viewpoint argues that, based on the universally recognized standard of "originality" for judging works, any creation independently completed by an AI robot should be protected by copyright law, without considering factors such as the use, value, and social evaluation of the work. [4] Another viewpoint suggests that the copyrightability of AI creations should be determined based on the production process. Since robots are not human and do not have the status of creators, their creations are not considered works. [5] This article believes that the first viewpoint regarding the copyrightability of AI creations is more in line with the current development status of AI and its creations. From a legislative perspective, AI creations are also copyrightable. After all, the essence of copyright law is to balance the conflict of interests between individual exclusivity and social sharing caused by works. As long as AI creations have significance under copyright law, creations produced by AI are also copyrightable works. [6]

The challenges that AI presents to the copyright system include the determination of the copyrightability of AI creations according to traditional object recognition standards and the challenges related to the principle of rights attribution. This also includes the potential for AI to engage in illegal reproduction or storage of others' works when collecting, storing, and using information from existing works for creation. [7] Therefore, in order to address the new challenges that AI creations have brought and will continue to bring to the traditional copyright system, it is necessary to explore the necessity and feasibility of copyright protection for AI creations.

#### 3.1. The Necessity of Copyright Protection for AI Creations

##### 3.1.1. The Need to Incentivize Literary and Artistic Creation

The incentivizing role of copyright law is widely

recognized as it promotes creation and innovation, driving the development of society and the economy. In the field of artificial intelligence, copyright protection for AI creations holds significant importance. The rapid development of AI technology requires substantial investment support, and copyright protection can provide returns and incentives for investors, further propelling the advancement of AI technology. [8] Additionally, copyright protection for AI creations can encourage AI users to engage in creative activities, enriching the content of the copyright market and meeting the needs of society and the public. [9] Therefore, copyright protection for AI creations aligns with the incentivizing function of copyright law, contributing to the economic and creative incentive objectives of the copyright system. [10]

##### 3.1.2. The Need for a Stable Copyright Market

With the development of artificial neural network technology and deep learning capabilities, AI creations have reached a level of originality that is difficult to distinguish from human works. At the same time, the efficiency and low cost of AI creation have led to an explosive growth in their quantity. A large number of high-quality AI creations entering the copyright market have enriched the content of the cultural market. However, they have also created competition with human works and even diminished the creative desire of human authors.

If AI creations are not granted copyright protection in the long term, it may result in two social consequences. Firstly, AI lacks legal awareness and may infringe upon the copyrights of others. The lack of copyright protection will lead to an increase in copyright infringement. Secondly, the absence of copyright protection may result in the misuse of AI creations without any recourse, causing chaos in the copyright field. Therefore, in order to prevent infringement and maintain the orderly development of the cultural market, it is necessary to provide copyright protection for AI creations. [11]

#### 3.2. Feasibility of Copyright Protection for AI Creations

##### 3.2.1. Requirement of Expression

Copyright law only protects specific forms of works. In China, Article 3 of the Copyright Law and Article 4 of the Implementing Regulations of the Copyright Law specify nine statutory forms of works and provide exceptions for certain works related to public interests. AI creations fall within the scope of works protected by the copyright system and comply with the relevant provisions of copyright law. According to the dichotomy of ideas and expression, copyright law protects the expression of works rather than the ideas themselves. Therefore, AI creations generated through data analysis and autonomous learning are considered external expressions, fulfilling the requirement of expression for works and meeting the requirements of copyright law.

##### 3.2.2. Requirement of Originality

Although the Implementing Regulations of the Copyright

Law in China include originality as a requirement for the constitution of works, it does not explicitly define its specific meaning. [12] Originality, as the core criterion for copyright protection, should focus on whether the content of the work itself meets the public's demand, rather than the creative process. On the other hand, artificial intelligence can be classified into weak AI, strong AI, and super AI. Although currently in the early stages, strong AI theoretically has the potential to reach the level of creativity of an average person and even replace human labor. Currently, AI creations already demonstrate a considerable level of creativity in their content. As AI continues to develop, its originality will become even more prominent.

### **3.2.3. Requirement of Reproducibility**

The wording "capable of being reproduced in a tangible form" in Article 2 of the Implementing Regulations of the Copyright Law in China refers to the requirement of reproducibility for works. Theoretically, reproducibility as a requirement for the constitution of works should be understood as "capable of being objectively perceived in an external expression." Whether it is the poetry collection of Microsoft Xiaoice or other AI-generated artworks such as paintings and musical compositions in the literary and artistic fields, they are presented to the public in a tangible form that can be objectively perceived. This aligns with the concept of "expression" mentioned in the first point, indicating that AI creations are tangible expressions rather than abstract thoughts. Since AI creations are tangible expressions, it can be said that they possess the quality of reproducibility as works.

## **4. Approaches to Copyright Protection for AI Creations**

AI creations, as a new phenomenon, face certain obstacles in terms of copyright protection within the current legal framework. To address this issue, it is necessary to consider adjusting the criteria for determining the originality of works to accommodate the unique characteristics of AI creations. Additionally, establishing a copyright registration system specifically for AI creations can help resolve issues related to copyright ownership. By implementing these measures, we can enhance the protection of copyright for AI creations.

### **4.1. Adapting the Criteria for Assessing Originality of Works**

Adapting the criteria for assessing the originality of works is crucial to address the protection of AI creations under copyright law. On one hand, it is necessary to abandon the traditional notion that "originality is exclusive to human creations" and enable AI-generated works to be protected by copyright. On the other hand, it is important to differentiate between human works and AI creations in terms of the criteria for determining originality, in order to better protect the interests of the general public.

Some scholars have proposed drawing inspiration from the "independent creation by the author + minimal creative threshold" standard established by the U.S. Supreme Court to assess the originality of AI creations. However, this standard may lead to issues of mass production and copyright infringement. Therefore, when setting the criteria for the originality of AI works, it is necessary to clearly define the conditions and establish precise measurement standards and implementation systems to ensure that AI creations exhibit a higher level of creativity than human intellectual creations.

Such adjustments can ensure appropriate copyright protection for AI creations while balancing the rights of creators and the interests of society, thereby promoting the development of AI-generated content.

### **4.2. Establishing a Copyright Registration System for AI Creations**

If AI creations are given equal protection to human works, it is likely to dampen the motivation of human authors and undermine the incentive effect of copyright law. Considering the unique characteristics of AI creations, such as their mode of generation and the influence of technological factors, their acquisition of copyright should be distinguished from traditional works. In other words, while providing copyright protection to AI creations, they should be differentiated from human works.

The establishment of a copyright registration system for AI creations is beneficial for improving and implementing the criteria for originality of AI works, and promoting orderly management in the field of copyright. The specific design of this copyright registration system can draw inspiration from the trademark registration system. Firstly, AI systems should have their own identity names, similar to registered trademarks. Then, the owners or users of AI can select works for registration based on the criteria for AI creations, and the relevant registration authority can assign a "registered trademark" to the eligible works using the AI system's name. Finally, this registration information should be promptly made public for consumers to make informed choices.

### **4.3. Resolving the Issue of Copyright Ownership for AI Creations**

There is a debate in the academic community regarding which entity the copyright of AI creations should belong to, whether it should be the AI itself, the AI designer, the AI owner, or the AI user.

#### **4.3.1. The Copyright of AI Creations Should Not Be Attributed to the AI Designer, Owner, or User**

On one hand, the AI designers should not be considered as the rightful owners of AI creations' copyright. It is undeniable that AI designers make substantial contributions to the development of AI, but these contributions are primarily reflected in the production of AI itself and have only indirect influence on AI creations. Furthermore, AI works are products of AI's independent "learning" and "thinking" that go beyond the original algorithms, programs,

and patterns. AI designers often do not directly possess or use the AI they design, so they should not be considered as the rightful owners of the copyright.

On the other hand, the AI owners and users should also not be considered as the rightful owners of AI creations' copyright. [13] Some scholars argue that the current stage of AI development is still in its early phase, and AI is not yet recognized as a legal entity. Therefore, it is more appropriate for the copyright of AI creations to be held by the owners of intelligent robots. This viewpoint is persuasive when considering the theory in civil law that the original object and its offspring belong to the owner. AI works can be seen as the offspring of AI and should belong to the AI owners. However, this viewpoint overlooks the objective reality that AI already possesses autonomous creativity and is rapidly advancing, which is necessary to keep up with technological progress and the ever-changing reality of society.

Moreover, there is also a debate about whether the copyright of AI works should belong to the AI owners or the users. For example, when an AI robot is leased for financing purposes and the lessee's intention is to use it for artistic creation, if the copyright of AI works is attributed to the owner of the intelligent robot, it is unlikely that there will be any lessee willing to lease it. Even if the lessee initially had no such intention, according to the characteristics of financing leasing, the lessor determines the leased AI robot and the seller based on the lessee's choice. During the lease period of the intelligent robot, attributing the works created by the lessee using the intelligent robot to the owner seems biased. Therefore, considering that AI designers, owners, and users all make substantial contributions to the creation of AI works, none of them are suitable as the rightful owners of AI creations' copyright.

#### **4.3.2. There Is a Rationale for Attributing the Copyright of AI Creations to the AI Itself**

Translation: Regarding the issue of attributing copyright of AI creations to the AI itself, most scholars hold a negative view. While the contribution of AI to the works cannot be ignored, due to its lack of legal personality, it cannot be held liable for infringement nor enjoy the same rights as natural persons. However, this does not mean that AI cannot have copyright over creations. The key lies in overcoming the legal personality barrier of AI.

Firstly, civil law stipulates that legal subjects include natural persons, legal persons, and other organizations. In the field of civil law, where "freedom prevails in the absence of specific provisions," AI is not explicitly excluded from legal subjectivity. Secondly, Article 9 of the Copyright Law states that the copyright holder includes two categories: authors and other citizens, legal persons, or organizations that are entitled to copyright under the law. Since legal persons and other organizations, as non-natural persons, can have legal personality and be "created" by law, AI can also acquire legal personality through "creation." Finally, the reason for the legal recognition of legal personality for legal persons and other organizations is based on the relationship between

natural persons and entities such as companies. [14]

Similarly, based on the relationship between natural persons and AI, copyright can be attributed to AI. After copyright is attributed to AI, it can be transferred to other natural persons, legal persons, or entities according to the relevant rules of intellectual property rights transfer.

## **5. Conclusion**

In conclusion, as we enter the era of artificial intelligence, AI creations possess copyrightability, and there is a necessity and feasibility to protect their copyright. The necessity of copyright protection for AI creations is mainly reflected in incentivizing artistic and literary creations, promoting economic development, and maintaining a stable copyright market. The feasibility of copyright protection for AI creations can be demonstrated through several aspects of the criteria for judging works: AI creations are expressions protected by copyright law, rather than mere ideas; AI creations already possess objective originality and can be replicated. Based on this, the copyright system should promptly protect the copyright of AI creations and regulate the emergence of new types of works in this field to ensure the forward-looking nature of copyright law. For example, copyright protection for AI creations can be achieved through appropriate adjustments to the criteria for judging originality, the establishment of a copyright registration system for AI creations, and the resolution of copyright ownership issues. In adjusting the criteria for originality, human creation should not be treated as a necessary condition for originality, and separate standards for originality should be established for AI works to differentiate them from human works. In establishing a copyright registration system, reference can be made to the more mature trademark registration system for effective management and protection. In terms of copyright ownership, it is necessary to break away from the traditional notion that copyright of AI works cannot be attributed to AI itself and separate the ownership of rights from the exercise of rights.

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## **Conflicts of Interest**

The author declares no conflicts of interest.

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