Research on the Ownership Determination of Copyright of Artificial Intelligence Generated Works

Hanxue He
School of Law, Hainan University, Haikou, Hainan, 570228, China

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Abstract: Artificial intelligence technology's quick development has presented the legal system and legal positions with difficulties. Under the premise of recognizing that AI-generated works are copyrighted, in order to protect the legitimate rights and interests of copyright owners, the attribution of rights to AI-generated works is an issue worthy of in-depth study. After analyzing the advantages and limitations of each of the five attribution models: public domain model, developer model, artificial intelligence model, investor model and user model, it is concluded that it is more advantageous to attribute the rights of AI-generated objects to users. The user model is more in line with the principle of "who creates, who enjoys" in theory, and has been supported in judicial practice to provide legal basis. While attributing the artificial intelligence generation to the user, it is still necessary to think about how to maintain and reflect the legitimate interests of the other parties, in order to better adapt to the development of artificial intelligence.

1 INTRODUCTION

Since artificial intelligence technology has advanced so quickly, it can now produce creative works in a wide range of fields, including but not limited to literary creation, musical creation, painting, and musical creation. This phenomenon has triggered an important discussion on the determination of the ownership of AI-generated works. While the traditional copyright legal system is mainly set up around the works of human authors, works created by artificial intelligence pose new legal challenges and legal positioning issues.

Currently, there is a big controversy over the application of copyright law to works created by artificial intelligence, mainly focusing on the determination of originality, the division of labor between human beings and artificial intelligence in the process of creation, as well as the legal practices in different countries and regions. On the premise that the copyright of artificial intelligence-generated content is acknowledged, to whom should the copyright belong? Balancing the interests among various stakeholders, including users, investors, and developers of artificial intelligence, not only pertains to the legitimate rights and interests of copyright owners, but also has a bearing on the legal framework conducive to the healthy development of artificial intelligence technology (Yang & Zhao, 2024). Therefore, an in-depth study of the attribution of the rights of works generated by artificial intelligence not only helps to protect the legitimate rights and interests of creators, but also helps to promote the balance between technological development and intellectual property protection.

2 RELEVANT DOMESTIC STUDIES

Currently, there are various views in the academic and practical circles on the attribution of rights to AI-generated works, mainly including five paths: attribution to the public domain, developers, AI, investors and users. The following will analyze the rationality and shortcomings of each viewpoint one by one.

2.1 Vesting in the Public Domain

The public domain view holds that, based on the perspective of the stage of technological development, when entering the era of strong AI technology, AI-generated products are more

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appropriately placed in the public domain for free use by the public. Humans are the masters of the earth, copyright can only be granted to human beings, as for machine-generated "by-products" can only be used as a public resource for human beings, but do not have the qualification of the subject of the right. Because the machine always lacks subjective consciousness and understanding, and does not have the ability to bring infringement lawsuits, it is the most appropriate arrangement to place the generated products in the public domain. As Judge Yates, who holds the natural law theory of property, argues, the value of the abstraction itself does not constitute a sufficient condition for property, the idea automatically enters the public domain after it is published, and an individual cannot exclusively own it, and the idea does not constitute a person's exclusive property, and there is no conflict between the author receiving a reward for his labor and his inability to obtain a copyright (Drahos, 2017). Although placement in the public domain helps to promote knowledge dissemination, reduce copyright barriers, and lower the cost of public access, its potential negative effects cannot be ignored. Due to the lack of copyright incentives, the quality of generated works may vary, which in turn affects the overall knowledge ecosystem, leading to the phenomenon of bad money driving out good money, dampening the enthusiasm of AI investors and the enthusiasm of natural authors for creativity, and is not conducive to the orderly operation of the copyright law system.

2.2 Attribution to the Developer

According to the theory of developers' enjoyment, developers indirectly decide the birth of AI products, and AI can produce results because developers design the program framework and algorithm template, and AI itself is the fruit of developers' labor. In order to guarantee the seamless functioning of the copyright law system, granting copyright to creators can effectively address the issue of the products' subject matter being allowed within the parameters of the current copyright law. It can also give developers sufficient rewards and lower the possibility of ethical risks. It can also reduce possible ethical risks and maintain the smooth operation of the copyright law system. However, the design of the attribution of rights is not logically valid. Firstly, in terms of the source of the generation, the developer decides the birth of the AI software, but the generation of the AI generation does not originate from the developer, but from the AI with the ability of deep learning, and there is no necessary causal relationship between the developer and the generation directly. Second, in terms of subjective intent, the developer lacks the subjective intent to create the AI generator, and the developer's purpose is to design the AI software, not to directly produce the AI generator. Thirdly, from the perspective of economic incentives, treating developers as authors of artificial intelligence products may be seen as overly motivating, as the development of artificial intelligence software often requires significant investment in manpower, resources, and finances. If attributed to developers, it will dampen investors' investment enthusiasm and hinder the circulation of artificial products. For example, buyers and transferees of artificial intelligence may lack incentives due to the inability to obtain copyright.

2.3 Attribution to Artificial Intelligence

Authors in copyright law include two categories, one is natural person authors and the other is unit authors. The progressive freeze and the growing person in the topic of natural people are examples of how the scope of civil law has historically tended to broaden. There are currently precedents pertaining to artificial intelligence and its rights, such as the United States using a Google driverless car with using artificial intelligence system recognized as the "driver", Japan granting a pet robot Palo household registration, and Saudi Arabia granting citizenship to the artificial intelligence robot Sophia. A few scholars believe that this shows that artificial intelligence may also become the subject of rights. However, in terms of the current situation, artificial intelligence to becoming the subject of rights, there are still many obstacles, and the author prefers to deny the subject status of artificial intelligence.

First, there is a lack of basic theoretical support for civil law. People's National Code provides for three types of civil subjects, such as natural persons, legal persons and unincorporated organizations, which are in fact a collection of human beings. Although artificial intelligence increasingly embodies the characteristics of human-like, but artificial intelligence is ultimately a cold machine, so people's national law has not recognized artificial intelligence as the subject of rights, copyright law as a branch of civil law, should not be added without authorization as the subject of the rights of artificial intelligence, even if the artificial intelligence by the future law to give the qualification of the subject of the law, it is still necessary to safeguard the human subject status and the right to control the system level,

to prevent falling into the Misunderstanding of anthropomorphic thinking (Xu, 2023).

Secondly, it is impossible to give artificial intelligence an "electronic person" subject qualification. In 2017, the European Commission adopted a proposal on the civil subject status of robots, which gave automated robots the legal qualification of an electronic person, so that the robots can independently undertake relevant civil responsibilities. This triggered a discussion among scholars to establish the legal qualification of an electronic person for artificial intelligence, however, it does not have institutional feasibility and practical feasibility. The subject of law depends on the confirmation or creation of the law, if there are no legal norms there can be no norms of the subject of law (Xu, 2018). From the viewpoint of legislative practice, there is no national law to include artificial intelligence in the subject of law, although there are relevant discussions, but not yet implemented at the legal level.

2.4 Attribution to Investors

The path of protection for artificial intelligence-generated objects should be appropriate for the protection of works, and choose natural persons, legal persons or unincorporated organizations that are related to artificial intelligence or linked to the generated objects. Some scholars are of the view that, it is appropriate to pick the protection path that offers investors the rights to the established works in order to evolve to the current stage of social advancement in people's countries.

Assigning the investor's rights to the developed work is a method that aligns with the present society's development demands. As people know, from the initial output of a generative work to the realization of its commercial value, it is a process that involves a team of professionals in many fields. The core purpose of the copyright law is to protect the works is to protect the legitimate rights and interests of the owners of the works, to ensure that they are duly rewarded, and to stimulate their enthusiasm for creation and promote the prosperity of social culture. Therefore, attributing the rights of generated works to investors can effectively realize this goal (Li, 2022). After enjoying part of the commercial benefits brought by their own investment, investors will be more willing to increase the human and material resources invested in the relevant fields, forming a virtuous cycle of investment-profit, thus further improving the quality of generated content.

2.5 Attribution to Users

Based on the above, compared with the indirect participation of developers, the commercial orientation of investors and the obstacles to the rights of AI itself, the active input, repeated adjustments and finalization of the user in the creation process are the closest to the connotation of "creation" in copyright law. Therefore, attributing the rights of AI-generated works to users is not only in line with the logic of jurisprudence, but also practicable in reality.

On the one hand, from the basic jurisprudence, "who creates, who enjoys the rights" is the general principle of copyright law to determine the attribution of copyright. "Creation is both the basis for the author's enjoyment of benefits and the boundary of the author's rights" (Xu, 2024). In the process of AI generation, the user undoubtedly acts as the creator. Users materialize their own creativity into cue words, input creation instructions to the AI software, and finally form content that meets their requirements after repeated modifications and adjustments. On the other hand, the user attribution model can also eliminate the difference between machine-assisted and machine-autonomous generation. If the AI generation is attributed to a subject other than the user, it is necessary to distinguish whether the machine is assisting in the generation of the work or autonomously generating the work. This would obviously lead to difficulties and ineffectiveness of determination in practice. In addition, the relationship between humans and machines has been evolving due to technological advances. It is impossible to determine when a machine starts to escape from the status of an auxiliary tool and create works completely autonomously (Yang, 2021).

A similar idea has been held by the Chinese court in recent years regarding the intellectual property rights of artificial intelligence creation. For example, in the Dreamwriter case, the court held that when the user makes an original contribution, the AI generated material constitutes its work (Civil Judgment, 2019). In the AI AI-generated pictures case, the court also held that when the user's operation constitutes an original expression, the user is entitled to the copyright of the pictures generated by the AI. With regard to creative intent, some scholars believe that AI-generated behavior represents the will of the developer or trainer (Xiong, 2017). This view is debatable. As mentioned above, the developer will certainly ensure that the AI generation moves forward on the right value track by setting preferences during the R&D process, but specifically in the generation process, the user directly decides the direction of the

details of the generation, which will most likely be beyond the developer's preset scope.

It has also been argued that, although the AI generation reflects the subjective viewpoint of the user, the actual generation is not under the direct control of the user. Therefore, directly considering AI users as authors is inconsistent with the objective fact that generative AI presents "human-computer co-creation". To answer this question, we need to start from the aforementioned methods of AI content generation. First of all, the mode of creation of generative AI is human-computer interaction, and therefore, the generated product has the appearance of a cooperative work of right. However, the generative AI is not the subject of creation and it does not create. Secondly, it is not in line with the logic of copyright law to deny the status of a creative subject on the basis of the unpredictability of the user. As the court judgment in the Dreamwriter case pointed out, "the automatic operation of Dreamwriter software is not unprovoked or self-conscious, and the way it operates automatically reflects the plaintiff's choice" (Xiong, 2017). In summary, taking into account the possibility of judicial practice, the user attribution model is preferable.

3 CURRENT STATUS OF FOREIGN RESEARCH

In the research context of this paper, special attention is paid to the exploration of copyright attribution and protection in the United States and its inspiration to other countries. As a global leader in science and technology innovation and the cultural industry, the U.S.'s copyright attitudes and protection methods for AI-generated works are exemplary for the development of international copyright law.

Numerous American academics have studied the future reasonable arrangements and ownership of AI copyright in great detail in order to address the rapid advancements in AI over the past few decades. This has created a useful conceptual basis for better protecting AI works in the United States. According to some American academics, artificial intelligence-generated works can be broadly categorized as either interpretative or non-interpretative. In the category of deductive works, if the generated work belongs to the deductive works of AI program, the programmer should own the copyright. If the generated work belongs to the deductive work of some basic works provided by the user, the user or the copyright owner of the basic works should own the copyright. In view of the fact that artificial intelligence is a result of the development of computer technology, many scholars believe that the definition and scope of deductive works can be expanded and interpreted, and artificial intelligence and computer creation can be regarded as an extension of the source code, and the process of creation is a process of deduction of the source code. This proposal has generated controversy in the academic community, primarily because the program's outputs are fundamentally different from the original code and truly lack the logic that generates them, so they do not necessarily fall under the purview of deductive works. In the category of non-deductive works, in the case of AI non-independent generators, the copyright belongs to the user of the AI. In the case of AI-independent creations, these works are not protected by copyright under current U.S. copyright law. In practice, however, these works qualify for copyright, and it is not reasonable to place the works in the public domain. Copyright can be granted to the owner of the AI, the AI itself, or the company that owns the AI. Given the negative impact of AI-generated works on the copyright market, some other scholars have argued for a copyright registration system and an annual fee, as well as a full dispute resolution mechanism, as the only way for them to obtain copyright protection. In such a registration process, a new standard of scrutiny could be used. In addition, some American scholars have further studied the copyright empowerment model of AI-generated works in the context of their own legal and judicial systems. They also proposed a retroactive rights attribution model and discussed the possible impact of this model on innovation encouragement and copyright protection (Li, 2020).

Some court cases in the United States judicial practice, such as Slater v. NOVAK, also provide important references for the legislation and practice of other countries, in particular with regard to the criteria for determining "creative contribution" and "instrumental use".

Therefore, the exploration of the United States in the copyright protection of works generated by artificial intelligence not only provides the possibility of dynamic adjustment for its own legal system, but also provides valuable experience and inspiration for other countries. The copyright law of the United States has been constantly adapting to the development of new technologies on the issue of copyright for works generated by artificial intelligence. As technology continues to advance, these explorations and revelations will continue to influence the direction of international copyright law.

When China explores the mode of copyright attribution of AI-generated works, it can also draw on the useful ideas of the United States regarding the determination of copyright ownership of AI-generated works according to specific national conditions.

4 CONCLUSION

With the development of AI technology, its role in the creative process has been expanding, triggering new issues and challenges regarding copyright attribution. The research field of attribution of AI-generated works has shown a diversified development, with different theoretical and practical paths reflecting the complexity and innovation of the field. Scholars from different countries and regions have proposed a variety of solutions, including but not limited to adjusting existing copyright laws, establishing new tenure arrangements, and managing this emerging field through contractual design. Through interdisciplinary cooperation, international dialogues and flexible legal innovations, strong legal support and guidance can be provided for the development of this emerging field.

While attributing AI-generated objects to the user, exceptions should also be set; if there is an agreement between the subjects on the attribution of copyright in the work, the agreement shall be followed. Artificial Intelligence Generated Substance meets the formal and substantive requirements of a work, and can be included in the copyright law for protection. As for the attribution of rights of the work, according to the current copyright law, the attribution of copyright of the work is based on legal provisions or contractual agreements, and the copyright law belongs to the field of private law, so it can be based on the principle of priority of the agreement to determine the attribution of rights of the relevant subjects first. The allocation of copyrights among different subjects through autonomy of meaning can give more flexibility to the rules of rights allocation. According to the agreement, users, investment companies, developers and other subjects can flexibly adjust the cooperation relationship and the proportion of rights and interests to adapt to changes in market demand, creation costs and technical input. Each subject can form a closer collaborative relationship in this process, which is conducive to the creation of more and more valuable works. From the perspective of balancing interests, investors can sign contracts with AI developers and users to complete the prior distribution agreement, reducing the possibility of interest disputes through the autonomy of the subjects, so that all subjects can maximize the benefits.

Scholars have put forward a variety of theories and proposals regarding the attribution of rights to AI-generated works, including the differentiated empowerment model, the attribution of investors' rights, the attribution of users' rights, and the platform autonomy model. These different theoretical and practical approaches reflect the exploration of the balance between the development of AI technology and copyright protection under the current legal framework. In the future, how to further clarify the details of the identification of AI-generated works and how to improve the identification of the attribution of the rights of different subjects of AI-generated works in the traditional copyright law are still directions to be considered. The people need to ensure both the driving force of technological innovation and the realization of fairness and justice; the people need to protect human creativity while also preventing excessive protection of ACGI crops. Future theoretical research and practice should focus more on how to protect innovation while avoiding conflicts of interest and unfairness.

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