

Research on Copyright Issues of Artificial Intelligence-Generated Works

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Abstract. With the advancement of artificial intelligence technology, artificial intelligence-generated works have been widely integrated into all aspects of social life. How to protect their copyright is an inevitable issue in contemporary legal practice. On the premise of meeting the requirements of originality, intellectual achievement attribute and tangible reproduction, artificial intelligence-generated works can constitute works in the sense of copyright law and have the rationality of being protected by copyright law. Taking the principle of closest connection and the principle of encouraging creation as the core, the copyright should be mainly attributed to the user. At the same time, a multi-dimensional mechanism including contract agreement, technical measures and liability sharing should be adopted to balance the interests among developers, investors and users, exert the maximum institutional efficiency, and enable it to continue to shoulder the mission of encouraging creation and prospering culture.

Keywords: Artificial intelligence-generated works; Copyright law; Work attribute; Right attribution.

1. Introduction

According to data in February 2025, the daily active users of AI applications such as DeepSeek have exceeded 30 million, setting a global growth record [1]. More and more people, based on artificial intelligence technologies such as deep learning and large language models, generate artificial intelligence-generated works with certain expression forms, such as texts, images, audio-visual contents and computer codes, through inputting instructions and then the algorithm system undergoes complex calculation, pattern recognition and content synthesis. It is pouring into all corners of social life at an unprecedented speed and scale, spawning a huge emerging market, forming a complete industrial chain including model development, platform operation, content generation and application services, and shifting knowledge production to public participation.

The rapid development of artificial intelligence-generated works has also brought unprecedented challenges to the traditional intellectual property system. In August 2025, the State Council issued the "Opinions on In-depth Implementation of the 'Artificial Intelligence +' Action", which specially emphasized "strengthening the protection, transformation and collaborative application of intellectual property rights", indicating that the copyright issue of artificial intelligence-generated works has become a key legal issue related to the construction of the innovation ecosystem; courts around the country have tried many cases involving whether artificial intelligence-generated works enjoy copyright. For example, in the first national copyright infringement case of "AI text-to-image" tried by the Beijing Internet Court in 2023 [2], the pictures generated by the plaintiff using Stable Diffusion were used without permission by the defendant. The court held that the plaintiff's personalized choices and intellectual contributions in prompt design, parameter adjustment and final selection were reflected in the process of generating the pictures, so the generated works should be regarded as works protected by copyright law. Similar to this case, the Nanshan District Court of Shenzhen identified AI-generated articles as corporate works in its 2020 judgment and granted them copyright protection [3]; the Yuehu District Court of Yingtian City also clearly pointed out in its 2024 judgment [4] that if the user only inputs simple prompts for "one-click generation" without reflecting original intellectual input, the generated content does not constitute a work and should not enjoy copyright protection.

The academic circle has conducted in-depth discussions on whether artificial intelligence-generated works can constitute works in the sense of copyright law and whether the right attribution should point to investors, developers or users [5]. On the basis of sorting out the theoretical differences in the academic circle, this paper intends to put forward the necessary conditions for artificial intelligence-generated works to constitute works under copyright law, and discuss the ownership of artificial intelligence-generated works regarded as works on this basis, in order to provide an operable legal identification path for the protection of the rights and interests of artificial intelligence-generated works and promote the healthy development of artificial intelligence technology and the creative industry.

2. Theoretical Controversies on Copyright of Artificial Intelligence-Generated Works

2.1. Theoretical Differences on Whether Artificial Intelligence-Generated Works Belong to Works

Whether artificial intelligence-generated works can be regarded as works in the sense of copyright law is the premise for the subsequent discussion on right attribution. In this regard, the academic circle has formed two major camps: affirmation and negation.

The affirmation theory [6] adopts a relatively open reader-centered and objectivist standard, holding that we should get rid of the constraint of subject qualification. As long as the generated works can meet public needs and serve cultural prosperity, we should not deny their work attributes because of the different generation procedures or creative tools. The so-called reader-centered theory means that when judging whether an intellectual output is a work, we should not only or mainly examine whether its creator has legal personality or subjective creative intention, but focus on the experience and perception of the audience of the output. Liang Zhiwen pointed out that "the aesthetic theory that interprets the meaning of works from the perspective of readers emphasizes that the meaning of works does not lie in the text itself or the author's consciousness, but in the audience's aesthetic activities" [7]. As long as the generated works have interpretable spiritual content and aesthetic feeling similar to works in the eyes of human readers and can produce aesthetic experience similar to human works, they can meet the requirements of works, regardless of whether their source is human or machine. This view shifts the anchor of judgment from who created it to how it is accepted and understood, thus opening the way for recognizing the work attribute of artificial intelligence-generated works. The objectivist standard emphasizes that when judging whether artificial intelligence-generated works have the originality required by copyright law, an external and observable measurement standard independent of the author's subjective intention should be adopted. Instead of delving into the internal operation mechanism of artificial intelligence or whether the user's instructions constitute "creative behavior", it focuses on the objective expression form finally presented by the generated works. Professor Yi Jiming once advocated establishing an objective standard for judging originality, namely the "sweat of the brow" [8] standard, proposing that even if artificial intelligence is not human, its generated works should be included in the object of copyright protection because sufficient labor, capital or intellectual resources are invested in the generation process.

However, some scholars believe that works must be original expressions of human thoughts or emotions, and human creation is the premise and foundation of works. The content generated by artificial intelligence is only the result of applying algorithms, rules and templates, lacking creative intention, which is essentially different from creation based on unique personality and emotion, so it does not constitute works in the sense of copyright law [9]. Some views hold that from the perspective of the historical evolution of copyright law, the legal system has always been constructed around human creators. Whether it is the author's moral rights emphasized by the civil law system or the copyright economic value concerned by the common law system, the subject of rights points to natural persons or conscious legal fictional subjects, not unconscious machine systems [10], so artificial intelligence-generated works should not obtain copyright protection. Scholars of the negation theory further explain that the originality protected by copyright law not only requires

independent completion, but also emphasizes creativity, which is closely related to human intellectual activities, personality choices and judgments. Even if the content generated by AI may show novelty objectively, as long as its generation process lacks direct and substantial intellectual guidance from humans, it cannot meet the requirement of originality [11]. For example, if the user only inputs simple and mediocre prompts and then the AI system automatically generates content, then in this process, the human intellectual contribution is weak or even absent, and its output can only be regarded as the result of program operation. Some scholars distinguish this situation from human creation with weak artificial intelligence as an auxiliary tool. The latter can constitute works because humans are in a dominant position in the entire creation process. Therefore, from the perspective of human centralism, the key to judging the copyrightability of AI-generated works lies in examining whether humans play an irreplaceable creative role in the generation process.

The two views of affirmation and negation respectively represent two value orientations of copyright law in the face of emerging technologies. The value of the affirmation theory lies in its forward-looking and practicality. It sees the similarity between AI-generated works and human works in objective form and their potential to meet public cultural needs, providing a relatively clear and operable standard for judicial practice. However, both the affirmation theory and the negation theory are difficult to fully cope with all possible situations in the complex practice of generating artificial intelligence works. On the one hand, the affirmation theory entrusts the judgment of whether it is a work to objective results and reader perception, dilutes the classic connotation of creation and works, and challenges the traditional boundary of copyright law protecting human intellectual creation. From this perspective, the negation theory is more principled, and its emphasis on the role of human creativity leads the discussion to a deeper level of how to define the substantial contribution of humans in AI-assisted creation. But in the face of complex AI systems with unpredictable output results, the standard of substantial human intellectual guidance is often vague and difficult to accurately grasp in practice, which is actually not conducive to the protection of the legitimate rights and interests of copyright owners.

2.2. Theoretical Differences on the Attribution of Copyright of Artificial Intelligence-Generated Works

On the premise that the generated works can constitute works, who the copyright should belong to is a more complex issue of interest distribution. At present, the views in the academic circle can be mainly summarized into four representative views: user theory, investor theory, developer theory and multi-dimensional interest distribution theory.

The "user theory" [12] advocates based on the principle of closest connection that the copyright of artificial intelligence-generated works should belong to the natural person user who has the closest connection with the generation process and makes substantial intellectual input to the generation process, and the role of artificial intelligence in it can be regarded as an advanced tool used by the user. On this basis, Song Chunyu further explained the relationship between tools and creative subjects, pointing out that "in the era of weak artificial intelligence, artificial intelligence only undertakes the role of an auxiliary tool to execute human instructions, and the presented work content is only the personalized expression of the user" [13], which means that the essence of current artificial intelligence is no different from traditional brushes or typewriters, and the copyrightability of its output results depends on the user's creative instructions and interventions. Zhu Mengyun pointed out that the user is the foundation and premise for the generation of artificial intelligence-generated works, and also the helper to fix them on tangible carriers. Therefore, according to the labor value theory, the labor paid by the artificial intelligence user makes it reasonable for him to claim copyright in the artificial intelligence-generated works [14]. In addition, scholars holding this view focus on analyzing the specific contributions of users in the generation process. They point out that in the generation process, the user inputs prompts reflecting personalized creativity, sets key parameters, repeatedly iterates and screens initial results, and even makes subsequent modifications and arrangements. This series of behaviors constitute "intellectual activities" in the sense of copyright law. At the same time,

from the perspective of incentive effect, scholars supporting the user theory propose that attributing rights to users is more conducive to encouraging and promoting them to produce more content and generate better social effects than attributing rights to investors or designers.

However, scholars who do not support this view believe that the user of artificial intelligence has no substantial control over the final form of artificial intelligence generation. Compared with the creative behavior of artificial intelligence itself and the creative behavior of programming designers, the efforts and labor they pay are not proportional to the benefits they can enjoy. Therefore, if the user of artificial intelligence is given exclusive copyright, it is not conducive to social fairness and justice. Therefore, some scholars turn their attention to the source of artificial intelligence technology [15], holding that the creative potential of the generated works has long been embedded in the algorithm design, model architecture and training data of the artificial intelligence system, and the intellectual labor of the developer is the underlying foundation and premise for generating all content, and the developer's contribution is fundamental. Scholars supporting this view believe that "for artificial intelligence-generated works, in the whole process of their being the creative expression achievements of artificial intelligence, the programming designer is the only human who contributes his own intellectual creation and efforts" [16]. But the great question facing this view is that it almost strips the user's immediate contribution in the specific generation link, which may lead to one-time development and permanent confirmation of rights, making the developer enjoy double intellectual property rewards for one intellectual labor creation, which is not conducive to further promoting the development and progress of artificial intelligence technology, and will also prevent more people from benefiting from the intellectual property system, which deviates from the original intention of copyright law to encourage the generation of specific expressions. Another problem arising from this view is that on what basis does the software developer have copyright in the work? Copyright protects the author's creative expression. When others use the artificial intelligence developed by the software developer to complete a work, does it reflect the expression of the other person or the software developer? [17] From the perspective of the operation mechanism of artificial intelligence, it is only a special way to generate content. The expression of the software developer does not enter the work through the user's use, and he has "separated" from the artificial intelligence after completing the development of the artificial intelligence. In addition, the same model can be used by countless users, and attributing the rights of the generated works to the developer in general will lead to irreconcilable conflicts in logic and practice.

However, the developer theory also faces questions, which directly point to the theoretical foundation of the developer theory that "the developer is the source of artificial intelligence". With the increasing R&D cost of high-tech products and the increasing uncertainty risk brought by R&D, it is difficult for individual designers to bear the huge costs and risks. The participation of investors helps solve this problem, but while investors bear huge economic risks, they also expect to recover investment and obtain returns through subsequent intellectual property income [18]. Secondly, the manufacturing process of artificial intelligence is cumbersome and complex, which cannot be undertaken by one person. In the stage of moving from weak artificial intelligence to strong artificial intelligence, the demand for capital and resource investment is huge. Therefore, investors need strong incentives, and attributing copyright to investors is of practical urgency. This theory regards artificial intelligence as the product of a major capital investment, focusing on protecting investors. It holds that compared with designers, users and other subjects, investors play a more core role in maintaining the R&D, operation and subsequent dissemination chain of the artificial intelligence system. Allocating copyright to investors to make their huge costs equal to investment risks is in line with the legislative purpose of copyright law to encourage investment and promote the dissemination of works, and can realize the maximization of resource allocation efficiency, thus continuously encouraging technological innovation and industrial upgrading, and helping to achieve a virtuous cycle of "technological progress - investment return - re-innovation" [19]. The "multi-dimensional interest distribution theory" [20] advocates adopting a more flexible and elastic perspective to distribute rights and interests among multiple subjects such as developers, investors and users according to specific

situations. Scholars holding this theory believe that as a thing, artificial intelligence not only has its creator, but also has new owners generated after the change of real right, as well as its users. This actually results in that the achievements generated by artificial intelligence involve multiple subjects. The developer of the artificial intelligence program, or the manufacturer and owner equipped with the artificial intelligence program or equipment, and the user of this program or equipment are all closely related to the generated content, and these subject identities may overlap. Therefore, the principle for determining the ownership of copyright of artificial intelligence-generated works should also be analyzed on a case-by-case basis, rather than a one-size-fits-all approach [21]. The positive significance of this view is that it jumps out of the traditional thinking of simply attributing rights to a single subject, and acknowledges that all parties such as developers, investors and users have made substantial contributions in different links such as data supply, algorithm design, capital investment, creativity stimulation and final generation. It is more adaptable to the current collaborative production mode of the artificial intelligence industry, taking care of the majority and avoiding major disputes. However, the problem of this view is that there is currently no clear and unified right distribution standard and legal identification rule. If it is improperly applied in practice, it may lead to new uncertainties. It is still necessary to further refine the measurement factors of contribution through legislation or judicial practice, and build a clear and predictable hierarchical and multi-dimensional protection rule.

3. Identification of the Work Attribute of Artificial Intelligence-Generated Works

Whether artificial intelligence-generated works constitute works in the sense of copyright law is the logical starting point for solving their copyright issues. In the above introduction to the theoretical differences on whether artificial intelligence-generated works belong to works, the affirmation theory downplays the internal connection between intellectual achievements and creative behaviors and avoids the source of the generated works; the negation theory adheres to a relatively pure concept of direct creation by natural persons, ignoring that in the context of AI as an advanced tool, human creative behaviors may change from direct writing to a new mode of guidance, setting and optimization. The debate between these two views just shows that for the identification of the work attribute of artificial intelligence-generated works, it is necessary to return to the classic definition of the connotation of works in the "Regulations for the Implementation of the Copyright Law" and conduct a hierarchical analysis.

According to Article 2 of the "Regulations for the Implementation of the Copyright Law of the People's Republic of China", a work refers to an intellectual achievement in the fields of literature, art and science that has originality and can be reproduced in a certain tangible form. It can be seen that to become an object protected by the "Copyright Law", it must meet the following three necessary conditions: first, the work should be an intellectual achievement; second, it has a certain degree of originality; third, it can be reproduced in a certain tangible form. "Being reproducible in a certain tangible form" emphasizes the possibility of being reproduced, that is, the work can be fixed in a perceptible objective form. So far, many artificial intelligence-generated works, whether generated beautiful pictures or articles, when these generated works are fixed on a certain carrier, they have corresponding forms of existence, such as CDs, books, pictures, etc., which can be actually contacted and copied by people, naturally meeting the requirement of reproducibility, and can be stably copied and disseminated through storage, transmission, printing and other methods. The technical feasibility of this condition is no longer controversial. Therefore, this paper does not specifically explain the copyrightability of artificial intelligence-generated works from this perspective. Only with the help of other conditions can we accurately judge whether artificial intelligence-generated works can become works in the sense of copyright law.

3.1. Analysis of the Originality Requirement

Originality is the core standard for the identification of works, which can be divided into two connotations: "independent completion" and "creativity". On the one hand, "independent completion" requires that the work originates from the author himself, rather than being copied or plagiarized from existing works. It focuses on the source and creative process of the work, emphasizing independence rather than uniqueness. Independence emphasizes that the creative behavior is completed independently by itself without plagiarizing existing works, but it does not require the creative achievement to be a unique work, allowing it to be highly similar to possible works. For example, if two photographers take highly similar photos at the same location without knowing each other, as long as their operations are completed independently by themselves without plagiarizing each other, both photos meet the requirement of independent completion. For artificial intelligence-generated works, the key focus of the "independent completion" condition is whether the natural person user independently leads the output of an unpreset result through his own intellectual activities. If the generation process of the generated works reflects the user's independent choices and arrangements, and uses unique instructions instead of directly copying and imitating the prompts and operations that others have used to produce specific outputs, it can be considered to meet the "independent completion" condition.

On the other hand, "creativity" is a more substantial layer in the concept of originality. It does not simply require that the user does not plagiarize or copy during the generation process, but requires that the work must contain a minimum degree of creativity. It cannot be mediocre and common, but must be creative, sparking and distinctive, bearing the unique mark of the author's intelligence. It can be seen that this theory focuses on the quality and inherent attributes of the work. In other words, investing a certain amount of labor does not necessarily mean generating creativity. For example, copying an existing book once requires a lot of labor input, but it is completely without creativity. For artificial intelligence-generated works, to judge whether they meet the "creativity" condition, it is necessary to focus on whether the user's personality choices, aesthetic judgments and intellectual ideas can be reflected in links such as prompt design, iteration process and result screening, so that the final generated works can reflect the user's unique personality mark. If artificial intelligence only executes a simple instruction, such as "draw a dog", the resulting featureless and templated result is considered to have no creativity.

In the above two conditions for judging originality, the judgment of the "independent completion" condition is relatively simple, as long as it is ensured that there is no plagiarism in the creative process. However, the judgment of "creativity" is still controversial in the academic circle. The focus of the controversy mainly revolves around two aspects. First, in terms of the benchmark for judgment, should creativity focus on the author's subjective intention or the objective expression of the work? At present, there are two views in the academic circle: subjectivism and objectivism. Scholars supporting subjectivism believe that creativity should be closely linked to the author's subjective creative intention. A work must be the external expression of the author's thoughts, emotions and personality. Artificial intelligence has no consciousness, emotions and creative intention, and its generation process is only a mechanical output driven by algorithms, lacking human spiritual creative activities. Therefore, no matter how creative the generated works seem, they lack creativity because their source lacks subjective intention [22]. This paper holds that this view is too rigid. With the rapid development of artificial intelligence, when humans can use artificial intelligence for complex creation, the artificial intelligence here should be regarded as an advanced tool, not as a subject of rights or a "author" of creation, so it is meaningless to discuss whether it has consciousness, emotions and creative intention. On the contrary, scholars supporting objectivism advocate looking from the perspective of external observers [23]. As long as the external representation of human behavior in the generation process reflects a certain degree of uniqueness, and the final expression form of the generated works reflects a minimum spark of creativity and has identifiable differences from existing works, it can be identified as having creativity. This paper supports the objectivist view, that is, focusing on the external differences of the expression itself, rather than excessively exploring the

inherent personality or emotions of artificial intelligence as a generation tool, avoiding the theoretical dilemma similar to subjectivism which cannot guess "machine thinking", and repositioning the focus of legal evaluation on the external representation of human behavior and the objective expression generated by it.

Through the above analysis, it is concluded that the judgment of the creativity of artificial intelligence-generated works should focus on the external representation of human behavior and the objective expression generated by the generated works. Then, in terms of the judgment standard, to what extent can the user make the output content have creativity? In recent years, judicial practice has made explorations. In the first national "AI text-to-image" case [24], the plaintiff Li input prompts through the open-source software Stable Diffusion to generate the involved pictures and published them on the Xiaohongshu platform. The defendant Liu used the pictures as illustrations for poems in his Baijiahao account without permission and cut off the plaintiff's signature watermark. The plaintiff claimed that the defendant infringed his right of signature and right of information network dissemination. When determining whether the involved pictures constitute works, the Beijing Internet Court focused on examining multiple operation links of the plaintiff from conception to complete generation. For example, in the prompt design link, the plaintiff designed detailed instructions on art type, subject details, environment and composition style; in the parameter adjustment link, the plaintiff set parameters such as iteration steps, picture height and random number seeds, adjusted the model weight and prompt content many times, and gradually optimized the generation results; in the final selection link, the plaintiff selected pictures from multiple generation results, reflecting the author's substantive choices on picture beauty and detail consistency. Based on the above review, the court held that the generation process of the involved pictures reflected the plaintiff's arrangement and substantive selection of the expression content of the generated works, the output content contained the direct and substantive intellectual guidance and personality choices of humans, and presented identifiable differences, which met the requirements of "works" in the "Copyright Law" and belonged to works of fine art. At the same time, the plaintiff, as a natural person who directly made intellectual input, enjoyed copyright. As a comparison, in a case tried by the Yuehu District Court of Yingtian City in 2024, the plaintiff Cui generated pictures with one click by inputting text in the "Jimeng Picture Generation" software and published them on his personal social account. The defendant company used the pictures in its official WeChat account. Cui required the defendant company to stop infringement and compensate for various losses. Different from Li's obvious intellectual input and personality choices in the generation process in the above case, Cui highly relied on the software's own technical functions in the creative process, only made simple language descriptions, and did not make manual modifications and parameter adjustments. Therefore, the court held that the involved pictures lacked the author's original expression, so they did not belong to original works protected by copyright law, and ruled to dismiss the plaintiff's claim.

By comparing the different judgment results of the above two cases, it can be found that for whether artificial intelligence-generated works have creativity and can become "works", the user's multiple interventions and sufficient personalized expressions in the generation process are the key identification basis. That is, the creativity of artificial intelligence-generated works is rooted in the user's extensive guidance and control over the algorithm model. Only when the generation process fully reflects human intellectual input and personalized choices can its achievements be included in the protection scope of copyright law, which provides an important reference for copyright protection in similar technical scenarios. These cases also confirm that the identification of originality is highly dependent on evidence support. Users must be able to prove that they have exerted substantial intellectual influence on the generated content through links such as prompts and parameter settings, and the output content has the user's unique personality mark. Therefore, creators should establish a sense of process traceability and retain detailed generation records as the basis for claiming rights.

In addition, if the technology can give users a wide range of choices and adjustment space, such as large models, which have a huge number of parameter setting conditions, users are more likely to create expressions reflecting their unique personality; on the contrary, if the tool has single functions

and the generation results are the same, it is difficult to form works protected by copyright law. This also explains why current AI applications based on large models are more likely to generate copyrightable content.

3.2. Analysis of the Intellectual Achievement Requirement

On the assumption that an artificial intelligence-generated work has originality due to the user's independent completion and sufficient intellectual input in the creative process, this section will demonstrate that the generated work belongs to the intellectual achievement required by copyright law. The word "intellectual" in the intellectual achievement condition traditionally emphasizes that the work must originate from human intellectual activities, not natural forces or mechanical reproduction. The generation of artificial intelligence-generated works is based on the conception provided by the user, and then the algorithm model parses, reconstructs and extends the semantics, integrating the expression elements generated by artificial intelligence based on training data and calculation logic. In this process, the user's input of the ideological framework and personality choices will inevitably reflect human intellectual activities, and the final output content is not a mechanical copy of human intellectual achievements due to the participation of artificial intelligence. Therefore, when judging whether such generated works can constitute intellectual achievements in the sense of copyright law, it is necessary to study whether the part participated by artificial intelligence can be regarded as intellectual achievements, that is, the core issue of discussion is whether to recognize that "intellectual achievements" can be jointly generated by human and non-human subjects, that is, users and artificial intelligence. Yang Lihua proposed that the goal of building artificial intelligence is to imitate and execute certain intellectual activities of the human brain, and in English terms, both "intelligence" and "intellect" can be expressed as the word "intellectual", which indicates that the meanings between artificial intelligence and human intellectual activities are common [25]. Although it is a little far-fetched to demonstrate a legal issue only from the perspective of etymology, it implies that there seems to be no insurmountable gap between artificial intelligence and human intelligence. To a certain extent, artificial intelligence-generated works, as knowledge products formed by imitating human intellectual activities, are reasonable to be identified as intellectual achievements required by copyright law. Specifically, it can be understood from the following two dimensions.

First, the essence of artificial intelligence-generated works is the digital realization of human intellectual goals, and the addition of algorithms does not affect their compliance with the essential requirements of intellectual achievements. In the complete generation process, the user's prompt conception, parameter debugging, and screening and optimization of output results make the generation process run through the user's knowledge accumulation, aesthetic judgment and creative intention; on the basis of digesting human input, artificial intelligence understands, recombines, deduces and extends information through algorithm logic, thus producing expression effects beyond the user's initial input. Although the participation of artificial intelligence leads to the generated works not being pure human mental activity achievements, from a technical perspective, the operation logic of the part participated by artificial intelligence is still rooted in the model architecture and data training preset by humans, and its operation mechanism itself is a high simulation of the human thinking process, the systematic collation and injection of human knowledge system, which embodies the multi-level intellectual contribution of humans, and can realize the imitation and substitution of human intellectual activities. Therefore, the part participated by artificial intelligence has the "intellectual" component consistent with human intellectual achievements, and the artificial intelligence-generated works, as composite intellectual achievements formed by the joint action of human intelligence and artificial intelligence, should be considered to meet the "intellectual achievement" condition.

Second, regarding such composite content formed by the joint action of human intelligence and artificial intelligence as intellectual achievements does not violate the legislative purpose of China's copyright law. According to Article 3 of China's "Copyright Law", a work is defined as "an intellectual achievement with originality and expressed in a certain form in the fields of literature, art

and science". This definition highlights the object attribute of the work, that is, the focus of legal protection is whether the work itself contains traces of human intellectual activities, rather than emphasizing the specific identity of the "author" participating in the creation. Therefore, in the context of China's copyright law, copyright law protects the "expression" of human intellectual activities, not the "purity" of the creative process. In other words, the judgment of the intellectual achievement condition does not strictly require the work to be completely completed by humans independently. If the work is required to be completely completed by natural persons, it is equivalent to denying the legality of all tool-assisted creation, which is obviously inconsistent with the reality of technological progress. This institutional design in China's copyright law also reflects a pragmatic attitude towards encouraging innovation. In recent years, judicial practices affirming the copyright protection of artificial intelligence-generated works have further strengthened this logic.

After clarifying the above issues, we can further deconstruct two key logical levels in copyright law: the first is the issue of right attribution involved in "authors creating works", and the second is the issue of protection object qualification pointed to by "copyright protecting works". Although these two levels are interrelated, they are legal issues at different levels and should be examined separately in legal evaluation. From the perspective of right attribution, "authors creating works" focuses on the corresponding relationship between the creative subject and the enjoyment of copyright, solving the problem of who enjoys the copyright. Article 11 of China's "Copyright Law" stipulates that "copyright belongs to the author", and does not require the author to be a subject "completely independently completing the creation by natural persons", nor does it deny the participation of advanced tools; from the perspective of protection object qualification, "copyright protecting works" focuses on whether the object meets the legal requirements of works. The core of this condition judgment is whether the external representation of human behavior in the generation process reflects sufficient intellectual input, and whether the final expression of the output content reflects the user's unique wisdom mark so as to have identifiable differences, rather than the purity of the creative process. Therefore, in the judgment of the copyrightability of artificial intelligence-generated works, we should not entangle with "whether the work is completely completed by natural persons" as a constituent element of intellectual achievement. As long as natural persons play a substantial leading role in the formation of the final expression, even if the expression is generated through artificial intelligence tools, it should be included in the protection scope of copyright law to fully encourage innovation and adapt to the needs of technological development.

4. Analysis of the Copyright Attribution of Artificial Intelligence-Generated Works

If it is determined that an artificial intelligence-generated work has become an object protected by China's "Copyright Law" by meeting the above three conditions, then there is no clear provision in the legislative level as to whether this right should belong to the developer, investor or user, and there are many differences of opinion in the academic circle. The current user theory, investor theory and developer theory proposed in the academic circle all provide justification from specific perspectives, but they all have insurmountable theoretical limitations. The user theory completely and exclusively attributes the copyright to the user, ignoring that the birth and operation of the artificial intelligence system are rooted in the long-term and complex intellectual labor of the developer and the huge capital risks and market uncertainties borne by the investor. These inputs are the basic premise for the generation of the generated works; the investor theory places industrial policy considerations above the legislative purpose of copyright law [26], blurring the boundary between copyright and other intellectual property rights protecting investment, and the creative enthusiasm of ordinary users will also be severely frustrated; the developer theory attributes the rights to the developer, which means that the developer can enjoy the value of all achievements generated by countless users using their tools, which is equivalent to claiming double intellectual property protection for one labor [27]. This is not only extremely unfair to the user who pays specific operations and creativity, but also makes the developer's income no longer dependent on developing better tools, but on the monopoly of user output, which will fundamentally weaken the motivation for continuous technological innovation.

Compared with simply assigning rights to a single subject, a more reasonable and practically feasible path is to draw on the flexible perspective of the "multi-dimensional interest distribution theory", on the basis of acknowledging the contributions of all parties, take the principle of closest connection and the principle of encouraging creation as the main basis to attribute the copyright to the user, and at the same time build an interest balance mechanism for other participating subjects such as investors and developers.

4.1. The Principle of Closest Connection and the Principle of Encouraging Creation

The principle of closest connection, in its origin, is a key principle developed in the field of private international law to solve the conflict of laws in foreign-related civil legal relations. It means that when choosing and determining the governing law of a certain legal relationship, instead of deciding the applicable law according to the original single and mechanical connecting factors, we comprehensively analyze various factors to determine which country or region's law has the most substantial, close and inseparable connection with the facts of the case and the parties, and then use the law of that place as the basis for ruling on the dispute [28]. Its prominent characteristics are its flexibility, openness and pursuit of substantive justice, avoiding the results of handling deviating from the actual situation due to too rigid rules. In demonstrating the attribution of copyright of artificial intelligence-generated works, we can draw on the legal logic of this principle to study the attribution of copyright of artificial intelligence-generated works, that is, when judging the attribution of rights, the essence lies in exploring which link's participant's input forms the most substantial, close and inseparable connection with the result that the generated work can constitute a work required by copyright law in the whole process of the birth of the generated work.

In the creative chain of artificial intelligence-generated works, the main subjects involved are the investors, developers of the artificial intelligence model and the users who use the artificial intelligence tool for generation. First, the investor's contribution is mainly reflected in the provision and control of funds, infrastructure and strategic direction in the early stage of artificial intelligence tool incubation, bearing the financial risks and market uncertainties in the process of project promotion. Without the capital investment of investors, the construction of large-scale computing power, the acquisition of massive data resources and the establishment of top R&D teams will be difficult to achieve. Therefore, we do not deny that the investor's contribution is basic and premise. However, this kind of contribution occurs at the front-end and macro level. The focus of investors is on the feasibility of technology, market return rate and the overall progress of the project. The investment behavior itself does not directly carry out personalized intellectual shaping for the specific content, style or expression form of a certain artificial intelligence-generated work, nor does it interfere with the specific aesthetic choices or ideological expression of the output content. Therefore, the connection between the investor's input and the specific "work" finally generated is indirect and intermediary, which does not meet the requirements of the principle of closest connection. After that, after obtaining the investment, the developers clean and label massive data through algorithm architecture, set complex model parameters and continuously optimize the training process, endowing the artificial intelligence system with the core ability of content generation. Their intellectual labor is embodied in the generation potential of the model. Once the model training is completed and delivered for use, the developer cannot predict and control what prompts the user will input in specific application scenarios, what parameter fine-tuning will be carried out, and how to screen and optimize the initial generation results. Therefore, the developer's contribution is reflected in creating a "tool capable of creation" itself, and the creative connection with the specific generated work finally produced is potential and instrumental, which also does not meet the requirements of the principle of closest connection. Finally, for the user who gets the creative tool, in order to obtain the desired output content, the user needs to clarify his creative intention and convert it into a series of accurate and enlightening prompts, repeatedly adjust the parameter settings, screen and optimize the initial generation results. This means that the final expression form, style and even the artistic conception it hopes to convey of the generated work are deeply branded with the user's intellectual choices and input. The user's intellectual activities form a direct and internal causal connection with the specific

content finally generated, which meets the specific requirements of the principle of closest connection. Therefore, the copyright of the artificial intelligence-generated work should be mainly attributed to the user.

The content of the principle of encouraging creation is that as an institutional tool to encourage information production and dissemination through right allocation, the significance of copyright law is to ensure that the copyright owner has exclusive control over his work, so that he can benefit from the use of the work, thereby encouraging him to continue to create [29]. In the AI generation chain, the input and expected return of each participant are different. First, for investors and developers, their expected return does not come from claiming copyright on a specific generated work, but from occupying market share through technological leadership, and finally achieving large-scale and sustainable commercial returns through technology authorization, service subscription, cloud services and the resulting platform economic effect. Therefore, the incentives for these two subjects, investors and developers, are already built into the business model. If the copyright is assigned to these technical parties again, it will bring duplicate returns and excessive incentives, which violates the essence of fairness pursued by law. In addition, if the copyright of specific generated works is given to investors, it is not only not highly related to their business model, but also may generate extremely high transaction costs due to their claiming rights to countless generated works, which will hinder the application and dissemination of technology, which undoubtedly deviates from the original intention of incentives. On the contrary, as the final content creator and value realize, the user's expected return is closely related to the value of the generated work itself. They expect the artificial intelligence-generated works produced through their intellectual labor to be recognized, and realize value realization through selling pictures, obtaining video copyright, authorizing use, or directly using them as part of their own business to obtain traffic and business opportunities. If the results obtained through their intellectual labor cannot be confirmed and protected by copyright law, users will have the uncertainty that their creative results may be arbitrarily copied and disseminated without any legal remedy, which will greatly inhibit their willingness to invest time and energy in high-quality and innovative creation. On the contrary, if the copyright is attributed to the user, it can reduce the uncertainty of subsequent transactions, provide clear expectations for the market, promote the effective dissemination and utilization of generated content, and further stimulate creative enthusiasm. Therefore, assigning the copyright of artificial intelligence-generated works mainly to users can achieve precise incentives and get twice the result with half the effort, which is most in line with the requirements of the principle of encouraging innovation, and also best realizes the important institutional goal of the copyright system to encourage creative activities and promote social and cultural prosperity through the protection of rights and interests.

4.2. Construction of the Path for Balancing the Interests of Multiple Subjects

As discussed earlier, investors, developers and other participating subjects do not meet the principle of closest connection and the principle of encouraging innovation, and the rights should be mainly attributed to users. However, the user's creative activities are highly dependent on a technical platform supported by investment and R&D, and a prosperous creative ecology must be built on an advanced, reliable and easy-to-use platform. If the legal rules only reward the users in the terminal link and completely ignore the contributions of the early developers and investors, in the long run, it will seriously dampen their enthusiasm for long-term, huge and high-risk investment in underlying technologies, making the user's creative tools themselves lose the source of evolution, which is extremely unfavorable to the sustainable and healthy development of the generative artificial intelligence industry, and also does not conform to the goal of the copyright system to encourage creative activities and promote social and cultural prosperity. In view of the undeniable huge contributions made by other participating subjects such as developers and investors to the development of generative artificial intelligence, we can draw on the multi-dimensional distribution model of copyright of film and television works [30], and on the basis of clarifying that the main rights belong to users, build a multi-dimensional interest balance mechanism to take into account the interests of multiple subjects, so as to build a more fair and efficient copyright system.

In practice, investors and service providers can share part of the rights and interests through various legal measures. First, contract agreement is one of the important tools to achieve interest balance. The platform can stipulate through the user agreement that while the user enjoys the copyright, the platform is allowed to use the generated content within a certain scope; or stipulate a hierarchical revenue sharing model. In the scenario of personal non-commercial use, the rights belong to the user, while in a specific commercial cooperation model, the platform and the user share part of the rights and interests or obtain revenue sharing. This arrangement based on autonomy of will not only respects the user's status as a creator, but also respects the personalized needs of different business models, realizing the refined allocation of interests. Second, from a technical perspective, investors and developers can also indicate the source of content by embedding electronic watermarks, digital fingerprints or copyright management information in the generated content, reducing public misunderstanding, and at the same time providing certain brand exposure and technical recognition for service providers. However, it should be noted that the application of technical measures should not affect the normal appreciation and use of the work, and the principle of moderation should be followed, and the watermark should be as hidden as possible; the copyright management information should not overemphasize the contribution of the technical party, weaken the user's author status and thus damage the user's legitimate rights and interests.

From this, based on the principle of integration of rights and responsibilities, in terms of the distribution of tort liability, a similar primary-secondary liability sharing mechanism can also be built. That is, the user mainly bears the liability. In addition, since the developer of the service undertakes the important function of data entry and control, it should be required to establish an effective identification and processing mechanism for infringing content, take necessary measures in a timely manner when informed, and bear corresponding liability within the scope of reasonable duty of care.

5. Conclusion

With the large-scale application of generative artificial intelligence, the texts, images, codes, audio and video and other contents produced by it have been deeply embedded in cultural creation, technological innovation, commercial operation and other activities. How the law responds is not only related to the vital interests of countless creators, but also related to whether a healthy and efficient legal environment can be built to stimulate innovation vitality and promote the prosperity and development of socialist culture. Focusing on the copyright protection of artificial intelligence-generated works, this paper systematically discusses the qualitative determination and right attribution of generated content, in order to respond to the challenges brought by the rapid development of artificial intelligence technology to the traditional intellectual property system, and provide a legal basis and operable judicial practice guidance for the implementation of the national "Artificial Intelligence +" strategy.

The starting point of the research lies in clarifying whether artificial intelligence-generated works can constitute works in the sense of copyright law. For the discussion of this issue, we should return to the classic definition of works in the "Regulations for the Implementation of the Copyright Law", focusing on the two key conditions of originality and intellectual achievement. In the analysis of the originality condition, it can be deconstructed into two levels: independent completion and creativity. The former examines whether the user independently leads the generation process through his own intellectual activities, while the latter can focus on the external representation of human use behavior and the uniqueness of the objective expression of the final generated work based on the objectivist standard. In the analysis of the intellectual achievement condition, the essence of artificial intelligence is the imitation and execution of human intellectual activities, and its operation logic is rooted in the model and data preset by humans. Its generation process can be regarded as the digital realization of human intellectual goals. This kind of composite intellectual achievement is classified as the intellectual achievement required by copyright law, which is not only logical, but also does not violate the legislative purpose of copyright law. On the basis of establishing that artificial intelligence-generated works can constitute works under specific conditions, taking the principle of closest

connection and the principle of encouraging creation as the core, the user can be regarded as the main owner of the copyright. At the same time, to ensure the healthy development of the artificial intelligence industry and take into account the legitimate rights and interests of developers and investors, an attribution path of building a multi-dimensional interest balance mechanism is proposed.

Looking forward to the future, the copyright protection of artificial intelligence-generated works is still an open and rapidly evolving field, and there are many issues to be further explored. Faced with the profound changes brought by artificial intelligence, copyright law can only continue to fulfill its era mission of encouraging creation and nourishing civilization by remaining open, pragmatic, flexible and forward-looking.

References

- [1] Data on daily active users of AI applications such as DeepSeek, February 2025.
- [2] Beijing Internet Court, (2023) Jing 0491 Min Chu No. 11279, available at Pkulaw.
- [3] Nanshan District Court of Shenzhen, (2019) Yue 0305 Min Chu No. 14010, available at Pkulaw.
- [4] Yuehu District Court of Yingtian City, <http://ytyhfy.jxfy.gov.cn/article/detail/2025/04/id/8805317.shtml>, accessed on April 17, 2025.
- [5] For the attribute of works, see Xu Xiaoben, On the Copyrightability and Copyright Attribution of Algorithm-Generated Works, East China Law Journal, No. 3, 2021, p. 41; Wang Qian, On the Qualification of AI-Generated Content in Copyright Law, Science of Law (Journal of Northwest University of Political Science and Law), No. 5, 2017, pp. 148-157. For the right attribution, see Chen Xinyue, Research on the Attribution of AI-Generated Works, Collection of Rule of Law Culture, Vol. 1, 2024, pp. 45-56; Wu Kai, Li Jinhui, Wang Zengxu, Analysis on the Copyrightability and Right Attribution of AI-Generated Works from the Perspective of Copyright Law, Special Zone Economy, 2022, pp. 103-106; Dang Xi, Wang Liquan, Research on the Copyright Attribution of AI-Generated Works, Journal of Zhejiang Sci-Tech University (Social Sciences Edition), 46(06), 2021, pp. 713-720; Liu Fang, The Legislative Dilemma of Copyright Attribution of AI-Generated Works, Journal of China Brand and Anti-Counterfeiting, No. 13, 2025, pp. 66-68.
- [6] Xu Xiaoben, On the Copyrightability and Copyright Attribution of Algorithm-Generated Works, East China Law Journal, No. 3, 2021, p. 41; Li Mengfei, Research on the Right Attribution and Protection Path of Generative AI-Generated Works in the Field of Copyright, East China Law Journal, No. 5, 2024, p. 192; Ji Aitong, Copyright Protection and Proof Elements of AI-Generated Content, China Publishing Journal, No. 8, 2025, pp. 53-60; Wu Handong, Institutional Arrangements and Legal Regulation in the Age of Artificial Intelligence, Science of Law (Journal of Northwest University of Political Science and Law), No. 5, 2017, pp. 128-136.
- [7] Liang Zhiwen, On the Legal Protection of AI-Generated Works, Science of Law (Journal of Northwest University of Political Science and Law), 35(05), 2017, pp. 156-165.
- [8] Yi Jiming, On the Objective Standard of Originality in Copyright Law, Journal of Tsinghua University (Philosophy and Social Sciences), No. 3, 2020, pp. 158-168.
- [9] Wang Qian, On the Qualification of AI-Generated Content in Copyright Law, Science of Law (Journal of Northwest University of Political Science and Law), No. 5, 2017, pp. 148-157; Liu Yinliang, On the Status of AI Works in Copyright Law, Political Science and Law, No. 3, 2020, pp. 2-14; Li Yiwen, Liu Yu, On the Non-Copyright Attribute of AI-Generated Works and Their Protection Path, Journal of Changchun University of Science and Technology (Social Sciences Edition), No. 4, 2021, pp. 28-34.
- [10] Intellectual Property Center of Chinese Academy of Social Sciences, Do "AI-Generated Works" Have Copyright?, CNBRC, April 4, 2018.
- [11] Thoughts on Copyright of AI-Generated Content, Social Sciences in China Network, April 16, 2025.
- [12] Chen Xinyue, Research on the Attribution of AI-Generated Works, Collection of Rule of Law Culture, Vol. 1, 2024, pp. 45-56; Wang Changzheng, On the Basis of the User as the Copyright Owner of Generative AI Works, Journal of Shanghai University of International Business and Economics, No. 6, 2024; Tang Yili, Niu Sihan, On the Subject of Rights and Copyright Attribution of AI-Generated Works, Fujian Tribune (Humanities and Social Sciences Edition), 2023, pp. 107-122.
- [13] Song Chunyu, Strengthen Copyright Protection of AI-Generated Works to Escort the Accelerated Development of New Quality Productivity, Democracy and Legal System Times, April 25, 2024.
- [14] Zhu Mengyun, Institutional Design for the Copyright Attribution of AI-Generated Works, Journal of Shandong University (Philosophy and Social Sciences), No. 1, 2019, pp. 118-126.
- [15] Wu Kai, Li Jinhui, Wang Zengxu, Analysis on the Copyrightability and Right Attribution of AI-Generated Works from the Perspective of Copyright Law, Special Zone Economy, 2022, pp. 103-106; Zhu Mengyun, Institutional

Design for the Copyright Attribution of AI-Generated Works, Journal of Shandong University (Philosophy and Social Sciences), No. 1, 2019, pp. 118-126.

- [16] Zhu Mengyun, Institutional Design for the Copyright Attribution of AI-Generated Works, Journal of Shandong University (Philosophy and Social Sciences), No. 1, 2019, pp. 118-126.
- [17] Wang Qian, On the Qualification of AI-Generated Content in Copyright Law, Science of Law (Journal of Northwest University of Political Science and Law), No. 5, 2017, pp. 148-157.
- [18] Dang Xi, Wang Liquan, Research on the Copyright Attribution of AI-Generated Works, Journal of Zhejiang Sci-Tech University (Social Sciences Edition)