

Study on the Copyright Protection of Artificial Intelligence Generated Objects

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Abstract: With the emergence of a new round of scientific and technological revolution characterized by intelligence, China has made rapid progress in the field of artificial intelligence. However, this new concept of artificial intelligence has not yet been fully integrated into the existing legal system, leading to legal dilemmas and systemic obstacles such as unclear attribution of the work, uncertain subject of the right, and unclear path of protection for the content generated by it. The traditional copyright protection model, concerning the generation of artificial intelligence, shows obvious maladaptation in terms of copyright generation, protection period, and content. Hence, there is a need to explore a copyright protection model suitable for artificial intelligence, namely the neighboring rights protection model, while considering relevant legislative practices from other countries dealing with AI-generated content. This paper aims to investigate the neighboring right protection model, which is an adaptable copyright protection model for AI-generated objects, and to draw insights from overseas legislative practices on AI-generated objects.

Keywords: artificial intelligence, copyright, legal protection

1. Introduction

In today's digital era, Artificial Intelligence (AI) has garnered widespread attention across various fields due to its rapid development and diverse applications. AI's presence is increasingly prevalent in creative domains such as art, writing, and music, where it exhibits remarkable creativity and originality by generating diverse works like paintings, texts, and music. However, this progress is accompanied by complexity and controversy surrounding the copyright protection of AI-generated works. These works are not created by human authors but generated through algorithms and machine learning, giving rise to numerous legal, ethical, and creative rights and interests concerns. Consequently, addressing copyright protection for AI-generated works presents a highly intricate and contentious issue. Moreover, the protection of AI-generated works' copyright also intersects with social and cultural development [1]. The application of AI-generated works in the realms of art, literature, and music has yielded impressive outcomes, unlocking new possibilities for human creativity and aesthetic experiences. Therefore, safeguarding the copyright of AI-generated objects is not merely about protecting the rights and interests of individual creators but also about promoting cultural innovation, social progress, and ensuring the flourishing development of creative industries.

This article initially delves into the issues surrounding AI-generated objects' copyright, including problems of object definition, attribution, and infringement. It analyzes whether AI-generated objects should fall within the scope of protection under the Copyright Law, explores the possibility of attributing copyright to the developer or user of AI, and addresses the responsibility for infringement. Additionally, it examines legislative practices related to copyright protection for AI-generated objects in the EU, the UK, and the US, aiming to offer valuable insights for domestic legislation. Furthermore, building upon the study of the limitations of the traditional copyright protection model, this article explores an alternative copyright protection model tailored to AI-generated objects, namely the neighboring right protection model. It analyzes the rationale behind this approach while proposing pathways to enhance the protection of neighboring rights for AI-generated objects.

2. Copyright Challenges for Artificial Intelligence-generated Objects

2.1. The Issue of the Object of Copyright in AI-generated Objects

In domestic law, copyright protection traditionally applies to works created by human beings. This approach stems from the historical context of human creative activities, with the primary goal of safeguarding the rights and interests of creators and fostering innovation. However, the rise of artificial intelligence has led to the emergence of more AI-generated works, raising the question of whether these works should be eligible for copyright protection [1]. Currently, Chinese laws do not explicitly specify whether AI-generated works can be subject to copyright protection, making it a topic that necessitates in-depth study and discussion within the academic community. Nevertheless, considering that the primary purpose of copyright is to protect the rights and interests of creators and foster innovation, it seems reasonable to extend copyright protection to AI-generated works as long as they are original, regardless of whether they are created by humans or generated by AI [2]. This perspective contends that copyright protection for AI-generated works not only safeguards AI innovations but also encourages further AI-driven creative activities. Such an approach is in line with the spirit of China's copyright law, which aims to protect and encourage innovation.

In foreign countries, diverse positions are taken concerning copyright protection for AI-generated works. For instance, U.S. law dictates that only works created by humans qualify for copyright protection, thereby excluding AI-generated works from such protection. This stance reflects the traditional understanding of U.S. copyright law, where only human-created works are deemed eligible for copyright protection [3]. Moreover, this perspective aligns with U.S. copyright law's objective of protecting the rights and interests of creators and fostering human creative activities. Conversely, English law asserts that as long as a work is original, irrespective of whether it is created by humans or generated by AI, it should be eligible for copyright protection. This position reflects the broad understanding of the object of copyright protection under UK law, wherein all works exhibiting originality are deemed worthy of copyright protection, regardless of whether the creator is a human or an AI. It also signifies the UK law's commitment to protect innovations, regardless of their origin from humans or AIs.

2.2. Attribution of Copyright in AI-generated Objects

According to Chinese copyright law, copyright is granted to the creator of the work. However, for AI-generated works, the creator is the AI itself, which lacks legal subjectivity and, therefore, cannot claim copyright. This raises the question: to whom should the copyright of AI-generated works be attributed? One plausible solution is to attribute the copyright of AI-generated objects to the developer or user of the AI. This viewpoint contends that while AI-generated works are autonomously created by AI, the development and use of AI are conducted by human beings,

thereby entitling them to enjoy the copyright of these works. This perspective aligns with the spirit of China's copyright law, which aims to protect the rights and interests of creators and foster innovation [3].

However, this view encounters challenges. Firstly, in some cases, the developer and the user of the AI may not be the same individual, necessitating a determination of who should be attributed the copyright. Secondly, if copyright of the AI-generated works is attributed to the developer or user of the AI, the issue of the scope and duration of copyright protection needs addressing. This is because the law usually determines the scope and duration of copyright protection based on the nature of the work and the creator's life cycle [1]. Yet, AI-generated works differ significantly from those created by human beings, making it inappropriate to simply apply existing regulations to determine the scope and duration of protection.

2.3. Copyright Infringement of AI-generated Objects

In China, when a work infringes upon another person's copyright, it constitutes an infringement. However, for works generated by artificial intelligence, the issue of infringement becomes more intricate. This is due to the fact that the law typically requires the infringer to possess subjective fault, meaning the infringer knows that their actions will infringe on the rights and interests of others, but they still proceed with such behavior [1]. Nonetheless, AI lacks subjective awareness and, consequently, cannot demonstrate subjective fault. This raises the question: how should infringement by AI-generated objects be addressed? One possible solution is to attribute the infringement of AI-generated objects to the developer or user of the AI. This perspective argues that while AI-generated works are automatically created by AI, the development and use of AI are executed by human beings, making humans responsible for any infringement related to these works. This viewpoint aligns with the spirit of the tort law, which aims to protect the rights and interests of right holders and uphold social justice.

However, this perspective also faces challenges, such as the issue of assuming tort liability. This is because, in the law, tort liability is usually determined based on the degree of fault exhibited by the tortfeasor and the outcomes of the tort. However, the degree of fault and the consequences of tortious behavior concerning AI-generated objects differ significantly from those of human beings. Therefore, their tort liability cannot be solely determined based on existing provisions [2].

3. Overseas Legislative Practices on Copyright of Artificial Intelligence-generated Objects

3.1. EU Legislative Practice

The European Union (EU) classifies AI-generated objects into two categories: those created by assistive AIs and those created by highly autonomous AIs. In 2016, the EU Parliament's Legal Affairs Committee proposed a motion to grant highly autonomous AI the status of "electronic persons." Consequently, the EU has established a registration system for "electronic persons," along with a compensation fund and mandatory insurance mechanism to address infringements concerning them [3]. As a result, the EU exhibits a positive approach towards copyright protection for AI-generated objects. Highly autonomous AI robots are granted an independent legal status and individual copyrights for the works they create.

3.2. British Legislative Practice

The United Kingdom's Copyright, Designs, and Patents Act 1988 addresses computer creations specifically. Section 9(3) of the Act stipulates that "In the case of a written, musical, dramatic, or artistic work created by a computer, the author shall be the person who has made the necessary

arrangements for the creation of the work." Additionally, Section 178 of the Act defines "computer-generated work" as a work created by a computer with no human author involved. It is evident from the UK's 1988 Copyright Act that a person is considered an author if they have made the "necessary arrangements" for a computer-generated work [3]. However, there is no precise definition of what constitutes these "necessary arrangements," leaving room for judicial discretion in determining who can be recognized as the author. The Copyright Act acknowledges the copyright attributes of AI-generated works, but lacks detailed provisions on the specific copyright attribution for such works, leading to a considerable degree of interpretation in judicial practice.

3.3. Legislative Practice in the United States

The 1976 U.S. Copyright Act requires three conditions to be met for creative works to obtain copyright protection: fixation in a tangible medium, originality, and authorship. Consequently, the exploration of copyright for AI-generated works must adhere to these three elements [4].

3.3.1. Artificial Intelligence Fixed on Tangible Media

The "idea-expression dichotomy" is a central concept in copyright law, affirming that copyright protects expression, not specific ideas. Therefore, the expression and fixation of ideas on tangible media are fundamental to copyright protection. The requirement for fixation in a tangible medium means that the work exists in a permanent or relatively long-lasting form, allowing for perception, reproduction, or communication [4]. AI works easily meet this requirement, as their works can be output in a digital format and fixed on paper or virtually any medium available to human creators. For instance, since the Associated Press partnered with Automated Insights in 2014, they have generated over 3,000 financial reports using their AI technology, the Wordsmith platform, which analyzes big data. Moreover, they have used the AI platform to automate stories about minor league baseball. These AI-generated pieces are published digitally on major websites or printed in booklets, both satisfying the requirement of fixation in a tangible medium.

3.3.2. Definition of AI Ingenuity

In many cases, AI-generated works meet the criterion of originality. The 1903 case of *Bleistein v. Donaldson Lithographing Co.* first defined originality, asserting that a work is original as long as it fits into the statutory categories set forth in copyright law and was independently created by the author [4]. However, the 1991 U.S. Supreme Court decision in *Feist* overturned the *Bleistein* standard and adopted a new standard of independent creation plus originality.

Prior to *Feist*, U.S. courts generally followed the common-law "sweat of the brow" standard, which considered the input of labor as the only requirement for originality. After *Feist*, while creativity became an essential factor in determining whether a work was original, the courts set a minimum requirement for originality, demanding that the author created the work independently, without copying from others, and that only a minimal degree of creativity was necessary (modicum of creativity). Consequently, U.S. copyright law does not require a high level of originality, and currently, many AIs are considered to possess some degree of originality.

3.3.3. The Question of Subject Matter Eligibility for Artificially Intelligent Creations

However, despite AI-generated works satisfying the above objective requirements, legally insurmountable difficulties persist in defining the subject of copyright - the author. Through a series of legal cases, the United States clarified the definition of the creator in Section 101 of the Copyright Act of 1976, stating that copyright belongs to the creator of the work. As early as 1956,

mathematicians Klein and Bolitho of the Burroughs Corporation in the United States attempted to register a copyright for the song "Push Button Bertha," created by the datatron computer. The U.S. Copyright Office outright rejected their application, clarifying that computer-created songs could not be protected by copyright because the creator of the work must be a human being and cannot be a non-human computer [4].

Subsequent cases, such as *Community for Creative Non-Violence v. Reid* and *Urantia Foundation v. Maaherrall*, heard by the Ninth Circuit, reiterated that only the person who orchestrates and coordinates a work can be recognized as the author. Furthermore, federal courts have emphasized the core concept of creative inspiration, asserting in *Bleistein v. Donaldson Lithographing Co.* that unique human creativity and response to nature distinguish human beings from non-human entities such as animals and machines. Such creative inspiration is the heart and essence of what qualifies a work for copyright protection, and granting copyright to non-human authors goes against the spirit of authorial works.

4. Study on the Copyright Protection Model of Artificial Intelligence-generated Objects

4.1. The Traditional Model of Copyright Protection

The traditional model of copyright protection centers on works created by human authors, aiming to safeguard the fruits of their intellectual labor and stimulate innovation and creativity. Under this model, copyright automatically arises upon the creation of a work, without requiring registration. This protection preserves the author's creative freedom and fosters innovation. The subject of copyright in the traditional model is exclusively human authors [5]. Creation is seen as a product of human intellectual labor, requiring innovative thinking and unique personal expression. Copyright encompasses property rights, encompassing reproduction, distribution, rental, exhibition, performance, projection, broadcasting, information network transmission, etc., and personal rights, including attribution, modification, and the right to protect the integrity of the work.

Generally, copyright protection extends for the life of the author plus 70 years, a widely accepted term worldwide. In cases of copyright infringement, the traditional model usually seeks legal liability for the infringer, encompassing civil liability (compensation for damages) and criminal liability (fines or imprisonment). This traditional copyright protection model has played a significant role in cultural and artistic creation, effectively safeguarding the rights and interests of authors and encouraging social innovation and development [6]. However, with the emergence of artificial intelligence, this traditional copyright protection model faces new challenges.

4.2. Limitations of the Traditional Copyright Protection Model

4.2.1. The Question of the Mode of Copyright Generation

The traditional model of copyright protection tightly links copyright generation to the creative process of a work. Upon creation, copyright arises automatically, without the need for registration or application. This model suits human-authored works as the creative process is usually evident, and the completion of creation is relatively easy to ascertain. Yet, when applied to AI-generated works, several issues arise [7]. Firstly, the creation process of AI-generated works is often opaque. AI generates works through technologies like machine learning and big data analysis, which typically occurs continuously and seamlessly, lacking a clear beginning or end. Consequently, determining when the creation of the work was completed, and thus when copyright arose, becomes challenging.

Secondly, the creation process of AI-generated works is often unpredictable. AI, through continuous learning and optimization, may generate new works at any given time. Adhering to the

notion of generating copyrights at the completion of creation might lead to frequent creation and disappearance of copyrights, posing substantial difficulties in copyright protection and management. Furthermore, the creation process of AI-generated works is often complex. AI may gather data from multiple sources and synthesize it to generate a new work. This complicates the attribution of copyright, as determining which data providers should be recognized as co-authors of the work becomes necessary [8].

4.2.2. The Question of the Duration of Copyright Protection

The traditional model of copyright protection usually sets the term of copyright protection as the lifetime of the author plus 70 years. This provision aims to protect the rights and interests of authors, foster innovation, and consider the public's interests, allowing the work to enter the public domain for free use after a certain period. However, AI, being a non-human entity, lacks a life cycle, making it impossible to determine the duration of copyright protection. Following the lifetime plus 70 years rule could result in the copyright of AI-generated works existing indefinitely, disadvantaging the public's interests [6].

Additionally, the rate of innovation in AI-generated works often surpasses that of human authors. AI can work 24/7, learn and optimize rapidly, and generate numerous new works in a short span. Following the lifetime plus 70 years rule might lead to a vast number of new works never entering the public domain, hampering societal innovation and development [7]. Moreover, the value of AI-generated works typically ties closely to time. AI usually generates works based on the latest data and information, with the value of these works becoming evident within a short period. Following the lifetime plus 70 years rule might extend the copyright protection far beyond the work's valuable period, negatively impacting copyright protection and management.

4.2.3. The Question of the Content of Copyright

The traditional copyright protection model encompasses two major parts of copyright content: property rights and personal rights. Property rights concern the use and exploitation of works, while personal rights involve the author's reputation and dignity [9]. When applied to AI-generated works, certain issues arise. Firstly, personal rights are rooted in human dignity and reputation, fundamental human rights. AI, being a non-human entity, lacks dignity and reputation, thus cannot enjoy personal rights.

Secondly, property rights hinge on the author's labor and innovation, serving as a reward for their efforts. However, AI-generated works do not result from AI's labor and innovation, but rather from the labor and innovation of AI's developers and users. Consequently, granting property rights to AI might overlook and violate the rights and interests of the developers and users. Additionally, exercising property rights in AI-generated works is problematic [8]. The traditional copyright protection model assumes that property rights are based on a person's will, a voluntary act. AI, as a non-human entity, lacks a will and cannot perform voluntary actions, thus incapable of exercising property rights.

4.3. Exploration of Copyright Protection Model Adapted to Artificial Intelligence-generated Objects - Neighboring Rights Protection Model

Articles 36 to 46 of the Copyright Law currently in force in China encompass "rights related to copyright", which are broadly considered as copyright and commonly referred to as "neighboring rights". As a cutting-edge global technology, AI requires appropriate regulation and protection to ensure its orderly development [3]. In China's Copyright Law, adopting the neighboring rights

model stands as the most effective approach to regulate AI products, striking a balance between the "work protection model" and the "no protection model".

4.3.1. Neighboring Rights Extend Beyond Protecting Work Distributors

With the growth and maturation of the cultural industry, the role of cultural product purveyors has evolved, and their rights have become more comprehensive. The Copyright Law established neighboring rights to comprehensively safeguard the rights and interests of these purveyors. Over time, forms of content expression have continually innovated. Neighboring rights were established to protect the investment in unoriginal labor and other aspects by the subject of neighboring rights, rather than original intellectual expressions [5]. The intellectual labor invested by the subject of neighboring rights often aids the author in expressing their thoughts, rather than showcasing individuality. The nature of these two types of labor differs significantly. The investment typically includes technology, material, etc., and does not constitute original intellectual expression like that of the author's work. For instance, publishers are entitled to layout rights, not because they have introduced entirely new forms of expression to their works, but because they have invested in the copyright of others' works, thereby incurring certain responsibilities.

While the intellectual labor they invest may share some similarities with creators, they cannot be treated the same way - their contributions typically pertain to technical and material aspects. Scientific innovations and technological advancements are driving legal system improvements. Neighboring rights should gradually encompass intellectual achievements unrelated to the dissemination of works but produced with a certain amount of labor or capital [10]. This approach enables the reasonable protection of a more diverse range of objects while promoting the development of a thriving market for literature and the arts.

4.3.2. Neighboring Rights Protection Model Facilitates Balancing Interests

In evaluating whether a particular product requires protection, it is essential to consider not only its inherent value but also public policy and legislative objectives. Since the Copyright Law can protect the rights of AI subjects, and AI-generated content offers advantages in terms of high quality, efficiency, quantity, and cost, the level of protection for AI-generated products should not be overly high [5]. On the other hand, if the degree of protection is too low, it may dampen developers' enthusiasm and motivation to innovate AI technology. Therefore, a neighboring rights model with a medium level of protection is more suitable for striking a balance between the interests of individuals and society.

Compared to copyright holders, neighboring rights holders generally receive less protection under the Copyright Act. Copyright holders enjoy not only property rights but also personal rights. In China's Copyright Law, it is stipulated that, with the exception of performers, other types of neighboring rights holders do not enjoy personal rights. Furthermore, the scope of rights of neighboring right holders usually encompasses only reproduction acts, excluding deduction acts, which is obviously narrower than that of copyright holders [7]. In reality, AI programs themselves may receive protection under the Copyright Law as computer software, and they may also be legally protected under the Patent Law of the People's Republic of China or the Law of the People's Republic of China Against Unfair Competition, due to the highly strategic value of AI technology. Additionally, AI research and development involve significant costs and require substantial manpower and capital. As AI generation does not meet the originality standard in the Copyright Law and cannot obtain legal protection under the work model, the neighboring rights model, serving as an option between high protection and no protection, stands as the most reasonable choice at present.

5. Improvement Path of Neighboring Rights Protection for Artificial Intelligence-generated Objects

5.1. Clearly Defining the Scope of Neighboring Rights for Subjects

Developers and investors in AI have various avenues to generate revenue, such as through rights transfer and licensing. Likewise, right holders can obtain financial benefits by charging license fees to Internet content distribution platforms or entering agreements for others to use the relevant works. To facilitate the exercise of rights by right holders, Germany's practice of establishing an AI creation neighboring rights authorization platform for authorization management can serve as a reference [10]. Balancing the interests between copyright owners and neighboring rights holders, the Copyright Law stipulates that the exercise of rights by neighboring rights holders requires the consent of the copyright owner, who also holds the right to participate in the distribution of remuneration from the exercise of neighboring rights. However, for investors in AI innovations, except in the case of a license contract, the consent of the software copyright holder is usually not required for creation, and the software copyright holder is typically not entitled to participate in the distribution of the relevant benefits.

5.2. Appropriate Limitation of the Duration of Protection for AI-generated Objects

Drawing from the existing 10-year protection period for neighboring rights to layout designs and 15-year protection period for neighboring rights to databases, it is important to recognize that most of these contents are generated by computers. Artificial intelligence-generated content has more similarities with databases, therefore, the author suggests that the period of protection of neighboring rights for artificial intelligence-generated content should be set at 15 years, calculated from the day the content is generated, and if the content is not distributed within 15 years of its completion, it will automatically enter the public domain [10].

The limited duration of protection for neighboring rights to AI-generated material is crucial as it enables the owner of AI's rights to control its primary profit market. Setting reasonable limits on the period of protection accounts for AI's ability to challenge human creativity and rapidly update content, preventing the undue restriction of the public's free expression if the protection period is excessively long.

5.3. Granting AI-generated Objects the Right of Attribution

Though artificial intelligence lacks originality and is thus not encompassed by the scope of personality rights protection, the author contends that it should be granted the right of attribution. In cases where the identity of the creator is unknown, distinguishing whether the content was created by a human or an AI can be challenging. Attribution can aid in clearly defining and effectively distinguishing between AI-generated content and human-created works, preventing the overprotection of AI-generated works [11]. Moreover, attribution serves as a bridge between AI and the content it generates, facilitating the identification of the various types of content created by AI. AI generated by multiple designers can exhibit different creative styles and appeal to diverse audiences, ultimately increasing the market value of AI-generated content.

The development of artificial intelligence will bring about unprecedented changes in society, impacting all fields. In the legal domain, scientific and technological innovation and the development of intellectual property law are interrelated, with scientific and technological advances promoting the innovation of the copyright system [10]. Protecting AI innovations requires balancing the interests of designers, users, and investors, promoting the healthy growth of the industry, and ensuring specialized institutional design. Only through this approach can a legal

foundation be provided for the positioning of AI-created content and, in turn, the favorable development of the industry can be fostered.

6. Conclusion

As artificial intelligence continues to advance, its applications will expand into various scenarios, leading to an exponential increase in the number of AI-generated works. Therefore, protecting the copyright of AI generators and establishing a favorable legal environment for AI is of utmost importance. Particularly in China, where the relevant legal framework is still evolving and being refined, it becomes imperative to adapt to the changing times and enhance and perfect the relevant legal provisions.

This paper has provided a fresh perspective on the copyright protection of works generated by artificial intelligence, challenging the traditional copyright protection model, and offering potential solutions to the practical challenges faced in safeguarding the copyright of AI-generated works. The journey towards effective copyright protection for AI-generated works requires continuous research and dedication from academia to promote the flourishing development of AI-generated works in China. As the field of artificial intelligence continues to evolve, the legal framework must evolve in tandem to ensure fair and effective protection for creators and foster innovation in this exciting realm of technology.

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