

The status quo and countermeasures of copyright protection for artificial intelligence products

HaoRan Dai

Anhui University of Finance and Economics, Bengbu 233030, China
Email: 363384060@qq.com

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Abstract

This study investigates copyright protection for AI-generated content. With the rapid advancement of AI technology, its application in creative fields has expanded significantly, transforming AI-generated works into a new form of creation that lowers entry barriers. However, this transformation also presents challenges such as copyright ownership disputes, disagreements over originality determination, and uncertainty in protection models. Addressing these issues is crucial, as strengthening copyright protection for AI-generated content respects creators' efforts, incentivizes innovation, enhances market incentives, boosts researchers' enthusiasm, and drives the development of AI and tech-cultural industries. The paper explores current copyright protection practices for AI-generated content and proposes countermeasures including clarifying copyright recognition criteria, establishing statutory registration systems, reasonably determining copyright ownership, and improving relevant legislation. Through comprehensive analysis of multiple challenges in AI-generated content copyright protection, and by referencing domestic and international legal frameworks, the study develops localized standards and protection pathways for AIGC (Artificial Intelligence-Generated Content) originality determination. These findings aim to establish a robust legal foundation for AI-generated content copyright protection, thereby promoting the healthy development and practical application of AI technologies.

Keywords

artificial intelligence; artificial intelligence generation; copyright; copyright protection

1. Overview of AI-generated products

1.1. Definition of AI-generated products

AI-generated content refers to material created by artificial intelligence systems through deep learning and big data training using algorithmic templates. This category encompasses various forms including poetry, prose, novels, paintings, and mu-

sis, with its core lying in AI's autonomous learning and creative capabilities. Technically, AI systems analyze massive data inputs using machine learning and neural network algorithms to identify patterns, ultimately producing content that combines creativity with practicality. AI-generated content can be categorized into two types: free-form generation and non-free-form generation. Free-form generation refers to content automatically produced by AI systems without human intervention, such as self-composed novels or poems. These outputs are treated as purely automated tools in this process. Non-free-form generation involves AI-generated content produced under human control and guidance, which formally resembles "works" created by human intellect, including literary pieces like poetry, songs, novels, films, and news articles. Technologically, the development of AI-generated content benefits from advancements in computer science, machine learning, and deep learning. By simulating human cognitive processes and intelligent behaviors, AI systems process and analyze data to achieve autonomous learning and creation. Throughout this process, these systems continuously optimize algorithms to enhance the quality and innovation of generated content

1.2. Features of AI-generated products

Artificial intelligence (AI)-generated works exhibit unique characteristics in content creation, processing, and copyright ownership. First, the content generation process of AI-generated works differs from traditional human creation, relying on massive data input and complex algorithmic processing. In this process, AI not only imitates human creative styles but also autonomously completes key creative components through technologies like machine learning. The emergence of this creative approach has made the originality and innovativeness of AI-generated works a focal point in copyright law protection discussions. During the creation process, AI-generated works can be categorized into three types: fully AI-generated works, partially AI-generated works, and entirely AI-generated works. Among these, fully AI-generated works use AI merely as a computational tool, with the creative outcomes remaining human-owned. Partially AI-generated works and entirely AI-generated works demonstrate AI's dominant role in the creative process, complicating the definition of copyright ownership and legal liabilities. Regarding copyright ownership, the protection of AI-generated works has sparked numerous controversies. On one hand, according to China's Copyright Law, works automatically gain protection upon completion without requiring any formal procedures. However, given the unique characteristics of AI-generated works, existing automatic protection principles appear inadequate. Therefore, some argue for establishing a statutory registration system similar to trademark registration for AI-generated works, requiring such creations to be registered with statutory authorities like the National Copyright Administration before obtaining copyright protection. Furthermore, the determination of originality for AI-generated works remains a crucial issue in copyright law protection. Given that these creations are fundamentally based on massive

data inputs, establishing independent legal frameworks with clear evaluation criteria and implementation mechanisms is essential. This requires not only assessing the replicability and originality of AI-generated content but also ensuring it demonstrates creativity surpassing human intellectual output. In summary, AI-generated works exhibit unique characteristics in content creation, production processes, and copyright attribution. These distinctive features not only challenge traditional copyright theories but also spark extensive debates about whether such works should receive copyright protection. As AI technology advances and legal frameworks evolve, the issue of copyright protection for AI-generated content will undergo increasingly comprehensive and in-depth discussions.

2. Current status of copyright protection for AI-generated products

2.1. International copyright protection status

Globally, legal records regarding AI-generated content predate domestic regulations in foreign countries. The copyright protection of AI-generated works is currently undergoing complex and multifaceted development. Different nations and regions exhibit varying legal attitudes and provisions based on their legal systems, industrial development needs, and socio-cultural contexts. In the United States, while statutory laws lack explicit provisions on AI-generated content copyright protection, Section 306 of the U.S. Copyright Office's Practical Work Manual indicates that copyright law only protects intellectual creations made by humans, implying that AI-generated works fall outside its scope. In March 2023, the U.S. Copyright Office issued Title 37, Part 202 of the Federal Regulations, explicitly stating that copyright protects only content created through human creativity. Works entirely generated by AI are not eligible for copyright registration, while collaborative works between AI and humans receive case-by-case recognition and registration for the human-created portion. In August of the same year, a U.S. court ruled that the illustration "The Closest Approach to Heaven" lacked copyright protection due to its complete AI generation without human creative input. However, driven by considerations such as promoting AI innovation and preventing legal lag behind technological progress, the U.S. adopts a "industry-first, legislation-later" approach, relying on public opinion, corporate self-regulation, and post-facto judicial-administrative responses to resolve related disputes. Several AI large model developers, including OpenAI and Google, have pledged to cover users' legal costs in copyright disputes related to model usage, aiming to boost industry development. UK law explicitly denies artificial intelligence legal personhood, stipulating that copyright for AI-generated works belongs to the party making essential arrangements—whether natural persons or legal entities. The UK Copyright, Design and Patent Act specifies that authors of computer-generated works are those who made necessary arrangements for their creation. In various scenarios, developers, investors, and users of AI

applications may qualify as "essential arrangement parties" to obtain copyright protection; when multiple parties collaborate, such creations become collaborative works. The EU is accelerating legislation requiring AI to disclose copyright information during training. Current EU regulations mandate that copyright holders can opt to prevent AI training of their works, compelling AI companies to remove relevant materials from training datasets. In 2017, the European Commission's Legal Affairs Committee proposed granting "electronic human" status to intelligent robots, though the proposal never took effect, signaling the EU's intent to recognize AI as legal entities. In Asia, India and New Zealand follow similar approaches, establishing regulations linking AI-generated works' copyrights to their creators.

From the perspective of international judicial practice, determining whether AI-generated content possesses copyright protection hinges on assessing whether human originality was involved. Content entirely self-generated by AI without human contribution is generally not considered copyrightable. However, in specific cases, judicial rulings vary across different countries and regions due to differing interpretations of concepts like "originality" and varying standards for judgment.

Overall, while most countries still adhere to traditional copyright protection models, the rapid development of artificial intelligence has sparked extensive international discussions on the legal status and rights attribution of AI-generated content. In the future, relevant legislation will continue to improve, and technological advancements will drive the establishment of clearer legal frameworks for copyright protection of AI-generated works. This will help balance multiple aspects such as encouraging innovation, protecting rights holders' interests, and promoting the healthy development of the AI industry.

2.2. Current situation of domestic copyright protection

With the rapid advancement of artificial intelligence technology, AI-generated content has seen increasingly widespread applications in creative fields, while copyright ownership and protection issues have gradually become focal points of legal and academic attention. In China, copyright protection for AI-generated works remains in a phase of continuous exploration and gradual refinement. Currently, there are no explicit legal provisions specifically addressing the copyright of AI-generated content in China, though legislative efforts are progressing and several judicial precedents have emerged with reference value. From a legislative perspective, the "Interim Measures for the Management of Generative Artificial Intelligence Services" issued in 2023 stands as a significant regulatory document in China's AI domain. The measures propose principles such as balancing development and security, implementing inclusive prudence and categorized tiered supervision for generative AI services. They stipulate that providers must legally conduct pre-training and optimization training data processing activities, use data with legitimate sources and foundational models, and refrain from infringing upon others' legally entitled intel-

lectual property rights when involved. This provides certain management guidelines for copyright issues related to AI-generated content, but does not offer direct or clear regulations regarding the copyright ownership and specific rights definition of AI-generated works themselves. In judicial practice, representative cases have emerged. In November 2023, the Beijing Internet Court concluded a copyright case involving "AI-generated literary and artistic works." The court ruled that the AI-generated images in this case possess "originality" as essential elements reflecting personalized human expression, thus qualifying as "works" protected under China's Copyright Law. In this case, the plaintiff explicitly labeled the accompanying images as AI-generated, a practice endorsed by the court in its judgment as consistent with the principle of good faith. This ruling holds pioneering significance in China, partially clarifying that AI-generated content meeting originality requirements may receive copyright protection under specific circumstances. In 2025, the Hangzhou Intermediate People's Court adjudicated a copyright infringement and unfair competition dispute involving generative AI services. An AI writing tool provided note-taking text generation products and services tailored to Xiaohongshu's platform features, which the platform operators deemed violated its rules and harmed their interests. The court determined that when applying AI technologies commercially on specific platforms, providers must respect platform regulations and fulfill corresponding due diligence obligations. While not directly addressing copyright ownership of AI-generated content, this case elucidates judicial interpretations regarding regulatory compliance and liability delineation in AI application scenarios, offering significant reference value for rights protection in related services.

3. Copyright protection challenges for AI-generated products

3.1. Legal challenges

With the rapid advancement of artificial intelligence (AI) technology, AI-generated works have increasingly captured public attention, while the intellectual property issues they raise have become more prominent. The existing legal framework faces unprecedented challenges in adaptability, copyright ownership, and liability determination. Firstly, regarding copyright attribution, the originality and innovation of AI-generated works qualify them as protected subjects under copyright law, yet AI itself cannot be recognized as a copyright holder. This necessitates reasonable institutional arrangements for rights attribution in AI creations, requiring copyright law theory to be grounded in human readership rather than solely focusing on human authors or inventors. Secondly, defining liability involves multiple contributors in AI creation processes—including developers, users, and third-party service providers—significantly expanding the scope of liable parties. Current legal frameworks lack clarity in liability allocation, particularly concerning data providers, model developers, and users. Furthermore, as AI technology evolves, some plat-

forms' "personalized recommendation" services allow users to customize model training and share trained models with others. This model involves processing sensitive data such as personal privacy and trade secrets. Assigning liability solely to internet service providers clearly cannot comprehensively cover all potential responsible parties. In judicial practice, controversies over identifying liable entities have emerged, and how to reasonably delineate responsible parties remains a challenge requiring further legal exploration. In conclusion, the intellectual property challenges posed by AI demand swift legal reforms. This includes revising legislation to clarify copyright standards for AI-generated content, establishing evaluation frameworks, and reshaping patent examination criteria for AI inventions through dedicated review guidelines to ensure precise patentability assessment. These adjustments will not only resolve ownership disputes but also incentivize industry R&D investments, maintain brand market order, and promote the healthy development of AI technology.

3.2. Social challenges

When examining the development of the artificial intelligence (AI) industry and its societal impacts, we inevitably encounter a series of challenges at the societal level. These challenges extend beyond technological progress itself to include public perception, interest balancing, and ethical considerations. First, public perception issues arise when AI technology's widespread adoption exceeds ordinary people's comprehension, leading to misconceptions and fears about AI. This cognitive gap may hinder the acceptance and application of AI technologies, potentially triggering social unease and resistance. Therefore, enhancing public understanding of AI technology and promoting AI literacy have become crucial for advancing the industry. Second, interest balancing issues emerge from AI's development involving multiple stakeholders: developers, investors, users, affected labor markets, and copyright-protected content creators. These conflicting interests require coordination through legal frameworks, policies, and social agreements. For instance, AI applications in creative fields raise copyright ownership concerns—how to strike a balance between protecting creators' rights and fostering technological innovation remains a societal challenge. Ethical issues are even more complex, as AI's use in decision-making, healthcare, and judicial systems may involve fairness, liability attribution, and privacy protection concerns. The decision-making process in AI technology often operates as a "black box" lacking transparency, making it difficult to trace responsibility and implement corrections when AI decisions deviate or err. Therefore, establishing a comprehensive ethical framework and regulatory mechanism to ensure AI applications align with social ethical standards is essential for promoting its healthy development. In summary, the advancement of the AI industry presents not only technical challenges but also societal challenges. To achieve sustainable AI development, governments, enterprises, and all sectors of society must collaborate

through educational initiatives, legal regulations, ethical reviews, and other measures. Only by doing so can we ensure that AI technology brings convenience and progress to society while gaining public acceptance and support, ultimately achieving harmonious coexistence with human society.

4. Suggestions for copyright protection of AI-generated products

4.1. Legal countermeasures

When discussing artificial intelligence (AI) in artistic creation and copyright ownership, we must first recognize that traditional copyright laws have become inadequate for emerging AI creative domains due to rapid technological advancements. This necessitates comprehensive legal reforms to establish clear legal safeguards for AI-generated artworks. First, improving legal frameworks remains the primary solution to copyright attribution issues in AI art. Current regulations lack clarity regarding rights ownership and frequently result in infringement disputes. To address this, we should expedite the development of specialized laws that define copyright ownership and ethical standards. This includes establishing copyright protections for AI-generated content, optimizing tools' performance and user experience, and enforcing penalties for infringements. Second, clarifying rights attribution is crucial. In AI art creation, ownership involves multiple stakeholders including developers, designers, and users. Within legal boundaries, we should compensate researchers for their investments and contributions during AI development. Such measures not only protect individual interests but also incentivize continued exploration in AI research. Furthermore, strengthening the crackdown on intellectual property infringements is a crucial measure to safeguard copyright ownership in AI-generated artistic creations. In the field of AI art creation, frequent infringement incidents not only harm rights holders' interests but also hinder technological advancement and social progress. Therefore, we need to intensify efforts in combating and penalizing such violations to protect the legitimate rights of AI art creators. In summary, proposals including improving relevant laws and regulations, clarifying ownership rights, and enhancing enforcement against infringements provide solutions for resolving copyright issues in AI-generated artworks. Through these measures, we can establish clearer legal safeguards for AI art creation, protect individual interests, encourage researchers to explore AI-related innovations, thereby driving technological development and social progress.

4.2. Social response

In the age of artificial intelligence, the principle of interest balancing in copyright law has become particularly crucial. With the widespread adoption of AI-generated works, conflicts between individual interests and public welfare have become increasingly prominent. The intellectual contributions of developers, capital invest-

ments from investors, and time commitments from users collectively form the valuation of AI creations. However, the value of these three elements is difficult to estimate, asset proportions remain unclear, and disputes often arise during profit distribution. Moreover, the emergence of AI-generated works has disrupted the equilibrium of cultural markets. Works not protected by copyright imply free access—yet their content quality rivals paid intellectual property, leading consumers to abandon traditional works. This gradual decline in cultural markets diminishes the value of human-created traditional works. Copyrights possess dual attributes of personal and property rights. Protecting copyright holders' interests through reasonable and lawful material incentives for intellectual labor remains an effective approach. In judicial practice regarding AI-generated works, full consideration should be given to researchers' investments and efforts during system development. Within legal permitted boundaries, appropriate compensation should be provided to incentivize scientific innovation. Regarding whether AI-generated works deserve copyright protection, some scholars advocate using neighboring rights. However, this approach contradicts both the nature of neighboring rights and the essence of AI-generated works themselves. Traditional neighboring rights—including performers' rights over their performances, producers' rights over sound recordings, and broadcasting organizations' rights over programs—are all derived from the reproduction and dissemination of works. Therefore, the human activities that generate these rights do not constitute creative creation but rather qualify as "non-creative inputs". In contrast, AI-generated content is better protected under copyright law. This is because AI developers intentionally create original works through dedicated equipment, algorithm development, and learning data selection to achieve creative purposes. The advent of the AI era necessitates corresponding behavioral norms. Ethical standards, formed through long-term societal development, inherently possess prescriptive characteristics that can address gaps in legal frameworks. Guided by the principles of current copyright law, we should leverage ethical norms to resolve legal disputes arising from AI-generated content, advance the AI industry, and ultimately foster the prosperity of China's technology and cultural industries.

Moreover, initiatives such as raising public awareness, strengthening industry self-regulation, and promoting balanced interests are equally crucial for the development of the AI era. With the advancement of strategic planning, the operation of open market economies, and the precision-driven R&D and application of AI technologies, the number of intelligent creative robots in modern society will continue to grow. In the future, AI-generated works will proliferate extensively in cultural creation fields. Therefore, improving copyright protection for AI-generated creations holds significant importance.

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