Intellectual Property Rights Issues in AI-Generated Content

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Abstract: *With the widespread application of AI-generated content across various fields, the issue of ownership of its intellectual property rights urgently requires resolution. This paper systematically analyzes the challenges posed by AI-generated content to the traditional intellectual property system, including the dilemma of identifying a subject and applying the originality standard. It further examines the limitations of theoretical debates such as the human authorship theory and the investment protection approach. Building on this analysis, the paper proposes systematic solutions, including establishing a tiered protection standard, constructing a rights allocation model that balances the interests of multiple parties, and improving the whole-chain safeguard mechanisms. These proposals aim to provide theoretical support for constructing an intellectual property governance framework adapted to technological development.*

Keywords: *AI-generated content; ownership of intellectual property rights; originality standard; rights allocation; legal challenges*

Introduction

The widespread emergence of AI-generated content is progressively reshaping the methods of content creation and dissemination, while simultaneously posing profound challenges to the traditional intellectual property system, which is founded upon human-centric principles. Its characteristics — algorithmic black-box nature, data-driven dependency, and the coexistence of reproducibility and randomness — create numerous theoretical conflicts and practical difficulties for existing legal frameworks when defining rights subjects and objects. Research into the ownership of intellectual property rights for AI-generated content is not only crucial for achieving a reasonable balance of interests among various parties in technological applications but also represents an inevitable requirement for the intellectual property system to adapt to the development of the intelligent era. This paper aims to systematically outline the impact of AI-generated content on the intellectual property system, analyze the applicability and limitations of existing theoretical approaches, and subsequently explore attribution schemes that align with both technological characteristics and legal logic, thereby providing references for relevant legislative and judicial practices.

1.1 Defining the Connotation and Classifying the Types of AI-Generated Content

AI-generated content refers to data outputs autonomously produced by artificial intelligence models based on algorithms, data, and predefined parameters, with limited or no direct human intervention, encompassing multimodal forms such as text, images, audio, and code. From a legal perspective, defining its connotation involves broad and narrow interpretations. Proponents of the broad definition argue that any output formed with the assistance of an AI system can be included in this category. In contrast, proponents of the narrow definition emphasize the autonomy of the generation process, asserting that only outputs resulting from a system's independent execution of structural creation towards a given objective constitute strictly defined generated content. This divergence in connotation directly impacts the subsequent characterization of legal relationships[1].

To facilitate effective academic discussion, it is necessary to categorize AI-generated content based on the degree of human intervention and the generation mode. A widely accepted classification divides it into three types: human-instruction-driven generated content, pattern-based content generated from specific training data, and autonomous creative content possessing a certain degree of randomness and adaptive capability. This typology not only helps clarify the boundaries of discussion but also lays a

theoretical foundation for subsequently analyzing the differences in intellectual property ownership across various generation modes. A precise grasp of its connotation and types serves as the logical starting point for systematically researching the intellectual property ownership issues pertaining to it.

1.2 Key Characteristics Distinguishing AI-Generated Content from Traditional Works

AI-generated content exhibits characteristics fundamentally different from traditional human-authored works in terms of its generation mechanism and output form, which constitute the root of legal challenges. The primary characteristic is the "algorithmic black-box nature" of the generation process. While the creation process of traditional works directly reflects the creator's subjective intent and mental activity, the generative logic of AI is embedded within complex neural network models. Its specific decision-making paths are often opaque and difficult to trace, hindering the application of the traditional "intent-expression" analytical framework.

Another core characteristic is "data-driven dependency." The creativity of AI models does not originate from internal inspiration or emotion but is built upon vast amounts of training data. Essentially, their output content involves learning, recombining, and re-expressing latent patterns within the training data. This creates intricate connections between the generated content and pre-existing works, readily triggering disputes concerning "derivative works" or "substantial similarity." Simultaneously, the generated results possess the distinctive feature of "coexistence of reproducibility and randomness." The same instruction may yield differentiated outputs due to variations in random seeds, challenging the traditional understanding of a work's "uniqueness" and "originality." These key characteristics collectively undermine the foundation of the human-author-centric intellectual property system.

1.3 The Impact of AI-Generated Content on the Intellectual Property Subject System

The existing intellectual property subject system is built upon a dual structure of "juridical persons" and "natural persons," with the core being human creators possessing will and consciousness. The emergence of AI-generated content poses a fundamental challenge to this subject framework. The core of this impact lies in the hollowing out of "author" identity. When content is autonomously generated by algorithms, there is a lack of a natural person behind it who can embody original thought and personal expression, rendering traditional rules for identifying authorship difficult to apply.

Recognizing the AI system itself as the author faces jurisprudential obstacles. Legal personality is typically conferred upon entities with rights capacity and capacity for conduct, whereas AI is currently still regarded as a tool or property, unable to bear legal liability or hold rights. The ensuing problem is a break in the chain of rights attribution. If AI cannot be the author, then to whom should the rights initially belong — the programmer, the provider of the training data, or the user who issued the generation instruction? This uncertainty intensifies the tension between investment incentives and rights protection[2]. The ambiguity within current law in determining a qualified rights subject has become one of the primary legal obstacles hindering the legitimate circulation and utilization of AI-generated content.

1.4 Challenges Posed by AI-Generated Content to the Standards for Intellectual Property Objects

At the level of the object of protection, AI-generated content poses a serious challenge to the cornerstone of intellectual property protection — the "originality" standard. Originality traditionally comprises two elements: "independent creation" and a "minimum level of creativity." Regarding "independent creation," although AI-generated content does not constitute plagiarism, its heavy reliance on training data complicates the judgment of whether it constitutes creation "independent" of that data. A more fundamental impact lies in the challenge to the "creativity" requirement.

In most legal jurisdictions, creativity requires a work to reflect the author's personality and intellectual judgment. However, the output of AI is the result of mathematical calculation and pattern recognition, a process devoid of human-like thought or emotion. There is no scholarly consensus on whether the frame of reference for judging its creativity should be a human standard or a machine standard. If the human standard is applied, almost all AI-generated content may fail to meet the creativity requirement due to the lack of a human author's intellectual imprint. Conversely, creating a new machine standard could fundamentally subvert the philosophical foundations of copyright law. This dilemma not only concerns whether individual AI-generated outputs can be protected but also

touches upon the fundamental question of whether the intellectual property system requires a paradigm shift in the age of artificial intelligence.

2. Theoretical Foundations and Key Controversies Regarding Intellectual Property Ownership of AI-Generated Content

2.1 The Continuation and Applicability Challenges of the Human Authorship Theory

The human authorship theory, grounded in personality-based philosophy, regards a work as an extension of the author's personality and a product of the author's mind, emphasizing the unique personality and intellectual will embedded in the original expression. This theory forms the core of traditional copyright law. In the context of AI-generated content, some viewpoints attempt to extend this theory, arguing for the attribution of rights to human participants who exert substantial influence over the generation process, such as users who set generation objectives, select key parameters, or perform post-generation modifications. These actions are viewed as an indirect manifestation of human creative will with the assistance of AI[3].

However, this theory faces fundamental challenges in its application. The autonomy and black-box nature of the AI generation process make it exceptionally difficult to precisely trace and prove the "creative" portion of specific human contributions. When human instructions remain at an abstract and simplistic level, it is challenging to establish a direct causal link between this input and the complex final output that meets the traditional standard of authorship. Forcibly applying the human authorship theory to highly autonomous AI generation behaviors risks overextending the theory's boundaries, thereby diluting the core status of authorial personality and leading to a disconnect between legal fiction and technological reality.

2.2 The Investment Protection Approach: An Analogy to the Legal Regime of Corporate Works

In contrast to strictly adhering to the human-centered authorship theory, another approach involves drawing an analogy from the legal regimes governing corporate works or works made for hire. This approach shifts the focus from the act of creation itself to the investment and organizational activities that enable creation. Its jurisprudential basis is the utilitarian incentive theory, which posits that legal protection should be granted to the entity that can maximize social welfare. In the context of AI-generated content, programmers, model trainers, or platform operators invest significant capital, technical resources, and computational infrastructure, serving as the economic source of the final output.

Through legal fiction, regarding these organizations or investors as the "author" in the legal sense aims to provide them with clear rights expectations, thereby incentivizing continued investment in the research, development, and application of AI technology. The advantage of this path lies in its resolution of the issue of clarifying the rights subject, facilitating subsequent market transactions and rights management. However, its point of contention is that it may excessively favor capital interests and, in effect, hollow out the traditional copyright law's requirement for an act of "creation," potentially transforming intellectual property protection into a mere tool for investment return and raising concerns about an imbalance in rights allocation.

2.3 The Scholarly Debate on the Rights of AI Programmers versus Users

At the specific level of rights attribution, the academic community is engaged in a theoretical debate between programmer-centric theory and user-centric theory. Programmer-centric theory posits that the creative capability of artificial intelligence is rooted in its underlying algorithms, model architecture, and training data — core elements all designed and implemented by the programmers. Programmers are likened to musicians who tune the instrument and compose the score; their intellectual labor predetermines the AI's "creative potential" and stylistic boundaries, and therefore, rights should originate from this source.

In contrast, user-centric theory emphasizes that the user's operational instruction is the crucial "trigger" that activates the AI's creative behavior. Through prompt engineering, parameter adjustment, and iterative optimization, the user guides and shapes the specific form and direction of the final content. Their role is analogous to an orchestra conductor, bearing direct responsibility for the artistic expression of the final output. The conflict between these two viewpoints is essentially a debate over

whether "creative potential" or "creative actualization" deserves greater legal protection. The former focuses on the contribution of the toolmaker, while the latter emphasizes the agency of the tool user. Each position has its own jurisprudential foundation, making a simple choice between them difficult[4].

2.4 The Controversy Surrounding the Public Domain Theory and the Construction of New Intellectual Property Rights

Confronted with the aforementioned attribution dilemma, a radical viewpoint advocates for directly placing AI-generated content into the public domain. This theory holds that since a human author conforming to traditional standards cannot be identified, and granting monopoly rights might hinder the free flow of information and subsequent innovation, the choice most aligned with the public interest is to forgo intellectual property protection. This approach is seen as the most straightforward solution to avoid legal disputes and promote the dissemination of knowledge.

However, opponents point out that completely abandoning protection could stifle industrial investment and lead to a "tragedy of the commons." As a compromise or alternative, proposals have emerged to construct a new type of intellectual property right. This new right might differ from traditional copyright by having a shorter protection term, a narrower scope of rights, and a lower originality threshold. Its core objective would be to ensure investors can recoup their costs while guaranteeing the public can freely use the content at an earlier stage. The controversy surrounding this proposal centers on its necessity and feasibility: opponents argue it would overcomplicate the legal system and create new barriers; supporters view it as an inevitable choice for responding to the technological revolution and achieving precise legislation. This debate profoundly reflects the inherent tension within the intellectual property system between its fundamental goals of incentivizing innovation and sharing knowledge.

3. Resolving the Dilemma of Intellectual Property Ownership for AI-Generated Content

3.1 Establishing Clear Legal Standards for the Protectability of AI-Generated Content

The primary prerequisite for resolving the dilemma of intellectual property ownership for AI-generated content lies in establishing clear legal standards for its protectability. The traditional originality standard within copyright law exhibits limitations in interpretation in this context. A viable approach involves constructing a tiered assessment system that takes the degree of human intervention in the generation process and the objective expressive form of the final output as its core considerations. For content generated with a high degree of autonomy, the assessment of its protectability should focus primarily on examining the output itself. This involves determining whether its expression transcends mere factual arrangement or templated output, demonstrating an external form possessing a minimum level of uniqueness that cannot be directly predicted from the input instructions.

This standard does not require investigating the AI's "creative intent." Instead, based on an objectivist stance, it examines the degree of expressive differentiation between the generated content and the existing body of knowledge. Concurrently, for generation processes involving deep human participation through guidance and iterative optimization, one could consider combining the human intellectual contribution with the generated content as a basis for holistically assessing its originality. The significance of clarifying this legal standard is to provide an operable analytical framework for judicial adjudication. This aims to prevent inconsistent adjudication across individual cases due to vague standards and to establish a logical prerequisite for subsequent rights attribution[5].

3.2 Constructing a Rights Attribution Model that Balances Investors and Users

On the basis of establishing protectability, constructing an attribution model capable of balancing the core interests of all parties is a key step. An absolute, single-subject attribution model struggles to address complex generation scenarios. One approach involves drawing on the institutional logic of neighboring rights to create a specific right tailored to AI-generated content. This right would initially vest in the entity bearing investment risks and organizational responsibilities, such as the developer of the AI system or the platform provider, thereby safeguarding their basic expectation of recouping R&D costs and obtaining economic returns.

Simultaneously, it is essential to protect user rights through legal mechanisms. Statutory licenses or contractual default rules could be employed to grant users who provide substantively creative

instructions during the generation process statutory rights of use or even rights to share in proceeds. This rights allocation model jurisprudentially integrates investment incentive theory with the principle of rewarding contribution, attempting to establish a balance of interests between the source investor and the process contributor. This model does not seek to identify a single "author." Instead, based on economic efficiency and fairness principles, it assigns corresponding legal rights to contributions of different natures, forming a multi-subject, tiered bundle of rights structure.

3.3 Perfecting the Whole-Chain Legal Safeguard Mechanism from Generation to Utilization

Determining rights attribution is merely the first step; supporting legal mechanisms are required to ensure these rights can be clearly defined and effectively exercised throughout their lifecycle. At the generation stage, strengthening recording and traceability mechanisms is crucial. Through technical means such as digital watermarking, metadata recording, and blockchain-based evidence preservation, the generation time, the model version used, and key input parameters should be fixed to provide factual basis for subsequent rights claims and infringement determinations[6].

At the circulation and utilization stages, a transparent framework for rights disclosure and licensing needs to be established. When licensing rights to external parties, rights holders should clearly inform licensees that they are granting rights related to AI-generated content and define the scope and limitations of use. For unauthorized use, infringement determination rules require greater refinement, focusing on analyzing the degree of substantial similarity at the expressive level between the accused content and the generated content in which the plaintiff holds rights, while also considering the legality of the training data source. This whole-chain safeguard mechanism aims to transform static rights attribution into dynamic, operable legal relationships, thereby reducing uncertainty in market transactions.

3.4 Exploring a Flexible Intellectual Property Rule System Adapted to Technological Development

The pace of iteration in artificial intelligence technology far exceeds the cycle of legal revision. Therefore, a future-oriented rule system must possess sufficient flexibility. Overly specific and rigid legal provisions may quickly become obsolete. One coping strategy is to adopt a "technology-neutral" legislative principle, defining functional standards rather than enumerating specific technological forms within core legal clauses, thereby leaving room for judicial interpretation. For example, the use of open legal concepts such as "substantial contribution in the generation process" allows adjudicators to exercise discretion on a case-by-case basis according to the specific technological context.

Simultaneously, industry self-regulation can be encouraged. Through community norms, standard contracts, and best practice guidelines, supplementary norms to statutory law can be formed. At the legal level, certain delegated legislative power can be reserved for administrative regulatory agencies, enabling them to issue corresponding detailed regulations tailored to specific stages of technological development. The core advantage of this multi-layered, flexible rule system lies in its ability to maintain the stability of the legal framework while retaining a degree of adaptability and evolutionary capacity through subordinate norms and judicial practice. This ensures the intellectual property system continues to fulfill its fundamental functions of resolving disputes and incentivizing innovation amidst technological transformation.

Conclusion

The issue of intellectual property ownership for AI-generated content fundamentally reflects the deep-seated tension in the interaction between technological innovation and the legal system. Through an analysis of its conceptual characteristics, theoretical controversies, and potential solutions, this paper argues that resolving this issue hinges on transcending the limitations of the traditional authorship theory and constructing a multi-tiered attribution model that balances efficiency with fairness.

Future research should further examine the ongoing impact of evolving generative AI technology on content production models. By integrating international legal harmonization with domestic institutional practices, scholars should deepen the exploration of issues such as the boundaries of rights, allocation of responsibilities, and ethical rules. This will facilitate the development of a more adaptive and forward-looking intellectual property governance framework, providing institutional safeguards for incentivizing innovation and establishing order in the age of artificial intelligence.

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