The Copyrightability Issue of AI-Generated Content: A Comparative Study (EU, US, China) and Legislative Responses

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Abstract. Artificial intelligence (AI) is advancing at an astonishingly rapid pace. The rise of generative artificial intelligence (Generative AI) has sparked numerous issues and challenges, as its creations pose a profound impact on the anthropocentrism and originality standards inherent in traditional copyright law. Currently, conventional copyright law is no longer adequate to address the challenges brought by Generative AI. The purpose of this study is to explore the similarities and differences in legal rulings and regulations regarding AI-Generated Content (AIGC) in the European Union, the United States, and China, and to investigate the issue of copyrightability of AI-generated outputs. Against the backdrop of globalization, this paper proposes approaches and relevant recommendations such as international collaboration, legislative updates, standard unification, and the establishment of new judicial framework. These measures are designed to address the challenges and opportunities brought about by Generative AI and content and content generation technologies, safeguard the innovative vitality and long-term development of the industry, and promote the technological advancement of Generative AI and economic growth.

Keywords: AIGC; Copyright Law; Copyrightability; Originality.

1. Introduction

Over the past decade, the rapid development of Generative AI has been driven by three factors: powerful computers, large amounts of available training datasets, and machine learning algorithms. This is reflected in the exponential growth of GenAI patents—from 733 patent families in 2014 to over 14,000 patent families in 2023—which not only indicates technological progress, but also a fundamental shift in the way creative content is produced [1]. This fundamental shift poses numerous challenges to the traditional human-centered copyright system, as large-scale production of AIGC has brought an immeasurable impact on current originality standards.

The widespread attention garnered by Artificial General Intelligence (AGI) has led people to marvel at the significant productivity improvements brought by AI. Unlike traditional search engines, AI has stronger capabilities in retrieval and integration, produces more accurate content, and operates more efficiently. At the same time, advances in the Transformer architecture within Large Language Models (LLMs) have accelerated the development of artificial intelligence from weak AI to strong AI, making it possible to develop and apply AI in more complex scenarios across different fields. The development of vertical AI is also highly anticipated. In an era where GenAI is bringing revolutionary changes, there are legal gaps and deficiencies in regulations regarding GenAI in various countries, and there are also significant differences regarding the copyrightability of AIGC, most directly reflected in the judicial precedents issued by judicial authorities in different countries.

2. The Theoretical Impact of AIGC on Copyright Law

Human authorship and the standards of originality are the cornerstones of the current copyright system. Article 3 of the *Berne Convention for the Protection of Literary and Artistic Works* explicitly states that "authors who are nationals of one of the countries of the Union." Here, it is clear that the definition of an author is human; any non-human entity (including AI, tools, animals, etc.) cannot be recognized as an author. Works should be created by humans and reflect human intellectual input and personalized expression. Originality requires that a work be the result of "author's own intellectual

creation" and reflect their individuality (EU standard) or exhibit a minimal level of creativity (US standard) [2]. However, in judicial practices across countries, the standard for human "intellectual input" in AIGC-related cases is difficult to unify. The same case may yield different judgments under different jurisdictions, and even similar cases may result in completely opposite rulings within the same jurisdiction.

There is an issue regarding the distribution of rights between users and developers in the ownership of AIGC. AIGC is inevitably influenced by training datasets, algorithms (developers' intellectual input), and user prompts (users' intellectual input). Developers train models to endow them with "expressive capabilities" by writing algorithms and selecting databases, while users choose and combine these expressive elements through inputting prompts or negative prompts. This leads to ambiguity in the ownership of AIGC. To illustrate the impact of developers' intellectual input, a simple example is that inputting the same prompt into different AIs produce different outputs. These differences may result from variations in the algorithms written by developers or differences in the databases chosen during AI training. If users are recognized as holding copyright, do developers similarly hold copyright over AIGC? Do developers hold rights to the "expressive capabilities" inherent in the models they create?

In the current era of rapid AI development, a new conflict has emerged between algorithmic transparency and the protection of trade secrets. The existing intellectual property framework systematically favors source code confidentiality, allowing developers to enjoy multiple forms of intellectual property protection without the obligation to disclose their source code. This sharply conflicts with the increasing public demand for transparency in governance in the algorithmic age, as confidentiality impedes the review of algorithmic bias [3]. Algorithmic opacity also leads to opacity in AI's "thinking process" and "decision-making process." Even when the same prompt is given to the same AI, different outputs may be generated. Users' inputs do not provide direct control over AIGC, and cannot determine the expressive elements of the generated content. The shift in creative content production methods brought about by AI compels us to rethink and redefine the standard of "originality."

3. Comparison of AIGC regulations in the US, Europe, and China

3.1 The European Union

Although EU copyright law does not explicitly stipulate that copyright requires a human creator, its "human-centered" focus is self-evident in legal practice. The principle of originality forms the foundation of copyright protection in the legal systems of European countries. This standard determines whether a work qualifies for copyright protection. The EU's standard of "author's own intellectual creation" requires that the subject matter must be the author's own (i.e., not plagiarized) and must be an "intellectual creation." This dual requirement is commonly referred to as "originality." This standard of originality does not require the work to have aesthetic or economic value; it only requires that the author freely and creatively chooses how to express their ideas during the creation process [4].

Whether copyright protection can be obtained does not depend on what tools humans use to create a work, but on the standard of "originality": whether there are human creative choices involved in the creation process. If the creation of the work leaves no room for human creative choices and is entirely determined by databases and algorithms, the work lacks originality and runs counter to the view that "human authorship matters." Therefore, works generated purely by AI cannot receive copyright protection. However, AI-assisted works with substantial human creative contributions may be eligible for protection, as humans make free and creative choices when using AI tools, causing the final work to reflect human intellectual input and individuality.

3.2 The United States

In January 2025, the United States Copyright Office (USCO) released Copyright and Artificial Intelligence, Part 2: Copyrightability, which explores the copyrightability of AI-Generated content (AIGC), clarifies the USCO's stance, and puts forward key recommendations. In the USCO report, a cautious position is clearly evident, aiming to apply existing copyright principles to new technologies and challenges. The USCO recognizes AI as a potential creative tool rather than merely a replacement for human creativity [5].

In the cases of Thaler v. Perlmutter and Naruto v. Slater, both the USCO and the courts rejected the notion that non-human entities can be authors. In the United States, outputs purely generated by AI without any human creative input are also not eligible for copyright protection. However, when AI is used as an assisting tool, and humans input identifiable creative expression to AI (such as images, text, etc.), and this expression is visible in the output, that portion is protected by copyright. Similarly, human choices, arrangement, and modifications of AI-generated content that are creative can constitute copyright protection for the human intellectual contribution. The use of AI-generated content in a work does not affect the work's eligibility for copyright protection. For example, using AI to create special effects in a film does not prevent the film itself from being protected as a copyrighted work.

It is worth noting that USCO indicates that the act of users providing prompts to AI is insufficient to establish the user's authorship. Prompts are essentially "ideas" or "instructions" and do not constitute copyrightable expression. Even if users inputting prompts or negative prompts multiple times, they are still unable to fully control the output content. Under this assertion, he 2023 "AI Text-to-Image" copyright case in China would likely result in a completely opposite judgment.

3.3 China

In China, there is currently no legislation explicitly regulating copyright issues related to AIGC. However, two cases that occurred three years apart have received widespread attention and scholarly discussion. The " Feilin v. Baidu Artificial Intelligence" copyright case (2019) and the "AI Text-to-Image" copyright case (2023) both involve AIGC, but there are two key differences: first, the artificial intelligence principles involved are different; second, the degree of human participation is different. In the " Feilin v. Baidu Artificial Intelligence" copyright case, the software involved preset templates, and by inputting data and related keywords, generated the content in question. The software did not leave space for user creativity and did not reflect the user's individualized expression, so the generated content did not qualify as a work. In contrast, in the "AI Text-to-Image" copyright case, the plaintiff adjusted and controlled the AI's output through actions such as selecting the model, choosing prompts and negative prompts, and setting generation parameters. The generated images embodied the plaintiff's intellectual labor and reflected their individualized expression, so the generated content qualified as a work [6].

In both cases, Chinese courts' focus on "intellectual input" represents an effort to uphold a human-centered copyright framework by exploring human agency in the creative process of GenAI. China's core regulatory philosophy regarding artificial intelligence also adheres to a people-oriented stance, considering that copyright law protects human creation, and at present, generative AI models lack free will and are not legal subjects, meaning AI cannot be a copyright holder. The ruling in the "AI Text-to-Image" copyright case will have a profound impact on future adjudications of AIGC-related cases. The court recognized that users hold the copyright to AI-generated images involved in the case, encouraging innovation through copyright protection, and, while considering utilitarian incentives, it also emphasized users' creative contributions [7]. However, the standard for originality set in the judgment was too low. It incorrectly analogizes AI to a camera and comparing human use of AI in creation to commission-based creation, ignoring the huge transformations brought by AI as a new form of productive force, which differs fundamentally from the former in both operational principles and content output. Hastily granting AIGC copyright could lead to serious consequences (deepfakes, stifling human creativity, intensifying platform monopolies, etc.).

4. Discussion

All three jurisdictions deny copyrightability to content generated entirely by AI. However, they differ in the stringency of their "originality" standards, and there are discrepancies between theory and judicial practice.

The European Union tends to protect the act of creation itself rather than just the outcome. Even when creation is assisted by AI, issues such as opaque decision-making and algorithmic black boxes exist. As long as the final work aligns with the author's initial intention and reflects their aesthetic or intellectual judgment, it may meet the protection standard. This approach continues the civil law system's respect for droit d'auteur.

The United States emphasizes human control over the creative process and specific expression. Merely inputting prompt words is considered providing ideas or giving instructions, not expression, as ideas and instructions cannot exert actual control over the AI generation process. If texts, images, or other materials provided by humans are reflected in AI-generated content and exhibit originality, the human contribution portion can be protected by copyright.

China demonstrates a certain degree of practicality and flexibility at the judicial level, but a unified standard has not yet been established. In the "AI Text-to-Image" copyright case, it was held that when humans use AI to create pictures, fundamentally, it is still humans using a tool to create, with the intellectual contribution throughout the creation process coming from humans rather than AI. However, the ruling did not clearly define the standard for "intellectual contribution," nor did it address the relationship between AI-generated decisions, the "black box" problem, and human expression. Therefore, there is considerable space for improvement in legal consistency and the rigor of standards.

While maintaining legal stability, the European Union focuses on adapting judicial practices to technological development, and its system reflects a combination of principled and flexible characteristics. The United States adopts a cautious and gradual adjustment policy stance. The USCO report aims to extend existing copyright principles to AI scenarios to prevent technological changes from undermining the traditional copyright foundation. Its strict standards are also intended to prevent the misuse of the copyright system, reflecting a strong pragmatic orientation. China consistently emphasizes a people-oriented concept in AI governance, but it is still in the stage of judicial exploration and policy formation, striving to balance the dual goals of "encouraging innovation" and "protecting human creation."

5. Recommendations

The emergence of AI has significantly lowered the barriers to creation, and its productivity is beyond imagination. If the characteristics of AI are not properly utilized, it can lead to serious consequences, such as low-quality AIGC disrupting databases, copyright trolling, and exacerbating the algorithmic divide. Therefore, courts should avoid hastily granting copyright to AIGC, and legislative bodies should engage in in-depth discussions with stakeholders, prioritizing the development of a comprehensive regulatory plan. This plan does not necessarily need to be centered on copyright and could consider technical measures (such as mandatory watermarking/labeling) [8]. While focusing on AI output, greater attention should be paid to the AI's thinking and decision-making processes to ensure that users maintain control over the results. This approach would be conducive to unifying the standards of "intellectual contribution."

AI, like any powerful tool, has a dual nature. We cannot throw the baby out with the bathwater and stop the development of AI technology, but we must take precautions and establish a multidimensional, systematic governance framework to ensure its positive development. Before reaching a global consensus on the copyright issues of AIGC, we should focus more on how to regulate the use of AI and reduce potential harm to others when using AI. Only in this way can we protect human rights against the backdrop of AI's profound impact on traditional copyright.

The key to reducing harm caused by AI lies in empowering responsible users and restricting and punishing malicious users. In scenarios such as school education and vocational training, emphasis should be placed on AI ethics education, learning about AI bias, privacy protection, social responsibility, and other related topics, to improve users' morals and literacy, and make them aware of the serious consequences of misusing AI. For high-risk AI applications (such as deepfakes and large-scale automated operations), strict implementation of identity verification and content digital watermarking technologies should be applied to increase the cost of malicious actions and ensure traceability after the fact.

Regulating AI usage requires building a comprehensive governance system composed of law, technology, industry self-discipline, and social supervision. It is necessary to establish laws and regulations that match the characteristics of AI. For example, China issued the Regulations on the Management of Deep Synthesis of Internet Information Services, which require that AI applications in high-risk areas must conduct security assessments (conducted independently or by commissioned professional institutions) according to the law, and mandates prominent labeling of information content generated or edited by AI [9]. On the level of technical ethics and design, efforts are made to develop Explainable AI (XAI) to ensure that every decision made in the machine learning process can be tracked and explained, improving model transparency and interpretability, making the AI decision-making process understandable, increasing users' control over generated content, and reducing the risks and costs of model governance [10]. Industry organizations are encouraged to strengthen self-discipline, establish and improve industry standards, and have companies jointly formulate and adhere to AI ethics codes to regulate AI development and application. Platforms providing AI services must take responsibility for content review and management and cannot evade or shirk regulatory responsibilities. AI governance is a societal and global challenge, requiring the public and media to report and expose illegal AI use, and encouraging scholars from all fields to study AI's impact on various industries, providing different perspectives and independent, objective advice for policy-making.

6. Conclusion

In the era of rapid AI development, the emergence of AIGC has challenged human-centered copyright law. Under the existing framework, it is necessary to explore whether AIGC can obtain copyright in order to safeguard human-centered rights and promote the long-term and healthy development of the AI industry. Regarding the issue of author identification, the international community has reached a preliminary consensus: artificial intelligence cannot be considered an author in the sense of copyright law. The view that "AIGC generated purely by AI is ineligible for copyright protection" has also been widely recognized. Currently, debates and research mainly focus on the threshold of a work's "originality" and the standard of human "intellectual contribution." If a work involves a significant degree of creative labor and judgment from humans during its generation, AI-assisted works may be eligible for copyright protection.

The threshold of "originality" and the extent of "intellectual contribution" in the creation process require clearly unified standards for judgment. Such standards not only involve judicial interpretations from different legal systems but also relate to cultural differences and cultural policy coordination among countries, international organizations, and regional organizations. Therefore, cross-border, multi-stakeholder, and multi-field cooperation is extremely necessary. Through international conventions, industry consensus, or bilateral and multilateral agreements, it is possible to jointly establish relatively unified guidelines and production norms to promote the healthy development of AI within the legal framework, regulate the lawful generation and dissemination of AIGC, balance technological innovation with copyright protection, and safeguard the common interests of all humanity.

The current research attempts to maintain the replication paradigm by seeking ways for human intervention in the AI creation process. However, this approach fails to address the fundamental

challenge: AI systems are capable of producing works that functionally replace human-created content without engaging in traditional forms of copying. In the future, we need to consider whether copyright law should go beyond addressing issues of reproduction to tackle problems related to market substitution and economic impacts.

Existing research attempts to maintain the "reproduction paradigm" by identifying ways of human intervention in the AI creation process. However, this approach fails to address the fundamental challenge: AI systems can create works that are functionally substitutable for human-created content, without engaging in "reproduction" in the traditional sense. In the future, we need to consider whether copyright law should go beyond addressing issues of reproduction to tackle problems related to market substitution and economic impacts.

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