

## Article

# Comparative Study on the Ownership of Copyright of Artificial Intelligence-Generated Works

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## Abstract

This article studies the question of copyright ownership for works produced by artificial intelligence. Taking China, the United States, and the European Union as the research subjects, a systematic analysis of the legislative provisions, administrative practices, and judicial precedents in each jurisdiction is conducted, concerning the copyrightability of AI-generated works and the question of rights attribution. On the basis of comparative analysis, this paper offers a theoretical review of the core disputes from the standpoints of the Lockean labour theory, the Hegelian personality theory, and the utilitarian theory. It constructs an analytical framework for distinguishing AI-assisted works from works generated autonomously by AI, with the substantiality of human participation as the core criterion, and puts forward a system of recommendations centered on a hierarchical ownership model. It advocates attributing copyright to the users of AI-assisted works that involve substantial human participation, establishing a special rights system with a shorter protection term for purely AI-generated works, and promoting the achievement of international coordinated consensus within the framework of the World Intellectual Property Organization, in keeping with the call of the Initiative for open, fair, and effective governance of artificial intelligence by all states.

**Keywords:** artificial intelligence-generated works; copyright; comparative law research

## 1. Introduction

### 1.1. Research Background and Problem Statement

In recent years, generative artificial intelligence (Generative AI) technology has undergone unprecedented rapid development. Marked by the release of ChatGPT by OpenAI at the end of 2022, large language models (LLMs) have achieved a qualitative leap in the field of natural language processing, capable of generating logically coherent and fluently expressed textual content. Concurrently, image generation models represented by Stable Diffusion, DALL-E, and Midjourney, leveraging deep learning technologies such as latent diffusion, are now capable of autonomously generating high-quality visual artworks based on text prompts input by users. In the field of music composition, AI systems such as Amper Music and AIVA have likewise demonstrated remarkable compositional abilities. The rapid development of these technologies signifies that artificial intelligence has evolved from a traditional auxiliary tool into a technical system with a degree of autonomous



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creative capacity, and its outputs are formally indistinguishable from literary, artistic, and musical works created by humans (Gaidartzi and Stamatoudi 2025).

The emergence of a large number of works generated by artificial intelligence poses a fundamental challenge to the traditional copyright legal framework. Since the establishment of the modern copyright system by the Berne Convention, copyright law has consistently taken the protection of “the fruits of human creative intellectual labor” as its core value orientation. Whether it is the institutional design of the civil law system constructed based on the author’s moral rights theory or the protection framework of the common law system based on the utilitarian incentive theory, they all assume that the author is a natural person. However, the emergence of works generated by artificial intelligence has fundamentally shaken this premise. When a painting, a poem, or a melody is not created by human hands but is autonomously generated by a technological system driven by algorithms and data, all the core concepts in traditional copyright law need to be reexamined (Mazzi 2024).

In this context, this paper raises the following three interrelated core research questions. Do the outputs generated by artificial intelligence meet the constituent elements of a “work” as defined in copyright law? In other words, are they eligible for copyright protection? If the outcomes generated by artificial intelligence are protected by copyright law, then who should ultimately own the rights—the developers of the artificial intelligence system, the users, or the artificial intelligence itself? What stances do the major jurisdictions around the world take on the above issues, and what are the differences and convergence trends among them? These issues not only possess profound theoretical value in jurisprudence but also have direct and far-reaching impacts on the practical application of AI-generated content in the fields of business and culture (Gaffar and Albarashdi 2024).

### *1.2. Survey of Prevailing Theories*

Regarding the issue of copyright ownership for works generated by artificial intelligence, various theoretical viewpoints have been formed within the academic community. The first theory is the theory of artificial intelligence authorship. This theory holds that artificial intelligence systems should be regarded as the authors of the works they produce. Its core argument is that artificial intelligence undertakes the main intellectual activities during the creative process, while humans merely provide the initial instructions or triggering conditions. However, this theory confronts a fundamental issue, namely that artificial intelligence does not possess legal personality. Within the existing legal framework, artificial intelligence can neither enjoy rights nor assume obligations (Guo 2026; Aronov and Idrysheva 2025). In sharp contrast to this is the absolute authorship theory, which holds that copyright is a fundamental human right and that the authorship identity belongs exclusively to natural persons. Therefore, because they lack the direct creative participation of humans, AI outputs cannot be regarded as authored works within the scope of copyright law (Mazzi 2024; Gaffar and Albarashdi 2024). The U.S. Federal Court established in *Naruto v. Slater* that non-human entities cannot be “authors” under copyright law, and the 2023 *Thaler v. Perlmutter* case explicitly extended this principle to the field of artificial intelligence. The U.S. District Court for the District of Columbia ruled that images autonomously generated by the AI system Creativity Machine could not receive copyright registration due to the absence of human authorship (*Thaler v. Perlmutter* 2023).

The third theory is the theory of commissioned work production. By drawing an analogy to the employment relationship, this theory regards the artificial intelligence system as a kind of employee, and the output of the system belongs to its owner or operator, which is similar to the attribution mechanism of commissioned works under Section 201(b) of the U.S. Copyright Act. The advantage of this theory lies in its ability to resolve the issue of right

attribution to a certain extent without breaching the existing legal framework. However, the main challenge lies in the fundamental difference between artificial intelligence systems and employees. Artificial intelligence neither possesses legal personality nor can it establish an employment relationship with an employer within the scope of labor law (Aronov and Idrysheva 2025; Guo 2026).

The fourth theory is the collaborative creation theory. This theory posits that both the developers and users of artificial intelligence are considered joint authors and jointly hold the copyright of works generated by artificial intelligence. In the RAGHAV case in 2020, the Indian Intellectual Property Office was the first to recognize an artificial intelligence system as a co-author of a painting. Although this practice has sparked extensive controversy in the field of intellectual property academia, it has pioneered the exploration of possible paths for copyright attribution in the collaborative creation between humans and machines (Aronov and Idrysheva 2025).

The fifth theory is the public domain theory. This theory holds that since the outcomes generated by artificial intelligence do not have a truly human author, these outcomes should be placed in the public domain, and anyone can freely use them without needing permission or paying any fees. This theory is the most logically coherent; however, it may give rise to certain negative impacts, such as insufficient investment incentives for the research, development, and innovative application of artificial intelligence technology (Wang 2026; Sun and Zhou 2026).

The final theory is the special rights theory. This theory advocates the establishment of a special legal protection system for the outcomes generated by artificial intelligence, which is distinct from traditional copyright. It grants these outcomes a shorter protection period and limited rights scope in order to strike a balance between legal certainty and public interests. The institutional inspiration for this theory derives from the sui generis right protection model established for non-original database compilers under the EU's 1996 Database Directive (Directive 96/9/EC). Each of the six theories outlined above has its own jurisprudential basis and practical limitations; no single theory can independently provide a fully satisfactory solution, which is precisely the fundamental reason why the issue of copyright ownership of AI-generated works continues to provoke academic debate (Mazzi 2024; Gaffar and Albarashdi 2024).

### *1.3. Research Gaps and Contributions of This Paper*

Although the theoretical schools outlined above provide rich analytical perspectives on the copyright ownership of AI-generated works, the existing literature still suffers from several notable deficiencies. Most studies focus on the analysis of a single jurisdiction or merely compare two jurisdictions, lacking a systematic comparative study of China, the United States, and the European Union, the three jurisdictions most typically representative in the field of artificial intelligence. China, as one of the most active countries in global AI industry development, has received insufficient attention and in-depth analysis in international academic discussions regarding its judicial practice, particularly the Beijing Internet Court's pioneering recognition of the copyrightability of AI-assisted works in the 2023 Li v. Liu case (Beijing Internet Court 2023).

Furthermore, there is insufficient scholarly attention to the originality of text prompts. In the process of AI-assisted creation, whether the prompts input by users constitute independently copyrightable expression, and whether a causal relationship in the copyright law sense exists between prompts and AI output, these questions directly relate to the legal distinction between "AI-assisted works" and "AI-generated works," and this distinction is precisely the logical prerequisite for resolving the issue of copyright ownership. The U.S. Copyright Office's partial revocation of copyright registration for the image portions in

the Zarya of the Dawn case, and its refusal of copyright registration for the Midjourney-generated image in the Théâtre D’Opéra Spatial case, both involve judgments on the “sufficiency” of user prompt contributions, yet existing theoretical frameworks have yet to propose a convincing measurement standard ([U.S. Copyright Office 2023a](#)).

The innovation of this paper lies in revealing the differences in institutional logic among jurisdictions on the issue of copyright ownership of AI-generated works through a systematic comparative study of the three major jurisdictions of China, the United States, and the European Union. This paper not only examines the legislative provisions of each jurisdiction but also places particular emphasis on analyzing the most recent judicial case law, including the Li v. Liu case in China ([Beijing Internet Court 2023](#)), Thaler v. Perlmutter in the United States and the S.Š. v Taubel Legal case within the EU, striving to provide a clearer analytical framework for the legal distinction between “AI-assisted works” and “AI-generated works” from a comparative law perspective and, on this basis, proposing institutional recommendations for constructing a “hierarchical ownership model” and an international coordination mechanism ([Municipal Court in Prague 2023](#); [Gaidartzi and Stamatoudi 2025](#)) reiterating the principal arguments, identifying research limitations, and outlining future directions ([Gaidartzi and Stamatoudi 2025](#); [Ambartsumian and Cannon 2025](#)).

## 2. The Impact of Artificial Intelligence on the Traditional Copyright Legal Framework

The following Section examines how generative artificial intelligence affects the traditional copyright framework. Three jurisdictions are surveyed because each has adopted a distinct path to attributing copyright in AI-generated content. The United States bases protection on originality and fixation under 17 U.S.C. §102(a), and on the idea–expression dichotomy under 17 U.S.C. §102(b). The U.S. Copyright Office Compendium §306 further limits authorship to a human being. The European Union relies on the standard of the author’s own intellectual creation, established by the Court of Justice of the European Union in Infopaq International A/S v. Danske Dagblades Forening (Case C-5/08) and continued in Painer and Levola Hengelo. Article 6 bis of the Berne Convention sets out the international source of moral rights for natural persons. China grounds protectability in Article 3 of the [Copyright Law of the People’s Republic of China \(2020\)](#), which defines a work as an intellectual achievement that is original and capable of being expressed in tangible form. Article 11 of the same statute assigns authorship to the natural person who creates the work. A legal person or unincorporated organization may be deemed an author when the entity organizes the creation, the work represents the entity’s will, and the entity bears responsibility for the work. Article 15 of the Supreme People’s Court Interpretation Concerning the Application of Laws in the Trial of Civil Disputes over Copyright (2002, revised 2020) further requires independent creation and a minimal degree of creativity. All three regimes share a basic commitment to human authorship. Their criteria, however, differ in flexibility and in the way each ties human input to the eligibility of a work ([Hugenholtz and Quintais 2021](#); [Gaidartzi and Stamatoudi 2025](#)).

### 2.1. The Traditional Copyright Framework Centered on Anthropocentrism

#### 2.1.1. The Human-Centric Nature of Authorship

The basic premise of traditional copyright law, that the author is a natural person, constitutes the logical foundation of the entire copyright system. Although the Berne Convention for the Protection of Literary and Artistic Works, concluded in 1886, does not explicitly exclude non-human authors in its provisions, its institutional design, from the moral rights stipulated in Article 6bis to the protection term system based on the author’s lifespan under Article 7, is predicated on the human creator as its core object. At

the international law level, this anthropocentric conception of authorship constitutes the common foundation of copyright legislation across major jurisdictions (Mazzi 2024; Gaffar and Albarashdi 2024; Guo 2026; Berne Convention 1886).

Under U.S. law, the Copyright Act (17 U.S.C. §102) provides that copyright protection extends to “original works of authorship fixed in any tangible medium of expression,” but does not define the term “author.” The U.S. Copyright Office, in its Compendium of U.S. Copyright Office Practices (Third Edition) §306, explicitly states that “the Copyright Office will register an original work of authorship, provided that the work was created by a human being,” further clarifying that “copyright law only protects the fruits of intellectual labor that are founded in the creative powers of the human mind.” In 2023, the U.S. District Court for the District of Columbia in *Thaler v. Perlmutter* confirmed this administrative position through a judicial decision, holding that “human authorship is a bedrock requirement of copyright”; in March 2025, the D.C. Circuit Court of Appeals upheld this ruling (U.S. Copyright Office 2021; *Thaler v. Perlmutter* 2023).

Under EU law, the Court of Justice of the European Union (CJEU) established through case law that the “author’s own intellectual creation” is the unified originality standard for copyright protection. Prior to the *Infopaq* decision, the standard was sectorally anchored in three early instruments: Article 1(3) of the Software Directive, (originally Directive 91/250/EEC, now codified as Directive 2009/24/EC) Article 3(1) of the Database Directive (Directive 96/9/EC), and Article 6 of the Copyright Term Directive (Directive 2006/116/EC, in respect of photographs), each of which conditioned protection on the work being the “author’s own intellectual creation,” while member state law continued to operate with divergent thresholds outside those three categories, ranging from the British “skill, labor and judgment” standard to continental European “personal stamp of the author” requirements (Margoni 2016; Hugenholtz and Quintais 2021; Mazzi 2024). This sectoral standard was initially applicable only to fields such as computer programs, databases, and photographic works, but was extended in the 2009 case of *Infopaq International A/S v. Danske Dagblades Forening* (Case C-5/08) to apply to all types of works covered by the Information Society Directive (Directive 2001/29/EC). The core import of this standard is that the subject matter of copyright protection must be the product of the author’s individual intellectual creative activity and must reflect the author’s personal characteristics. Although neither the EU directive system nor CJEU case law explicitly excludes non-human authors, the inherent requirement of human intellectual participation within the expression “author’s own intellectual creation” effectively precludes purely machine-generated content from entering the scope of copyright protection (*Infopaq International A/S v. Danske Dagblades Forening* 2009; Margoni 2016).

In China, Article 3 of the Copyright Law of the People’s Republic of China (amended 2020) defines a “work” as “an intellectual achievement that is original and can be expressed in a certain form in the fields of literature, art, and science.” While this provision does not explicitly limit authorship to natural persons, the term “intellectual achievement” is generally interpreted in Chinese legal theory and judicial practice as presupposing human intellectual participation. Furthermore, Article 11 of the law defines an author as “the natural person, legal person, or unincorporated organization that creates a work,” where authorship of legal persons and unincorporated organizations is based on legal fiction rather than actual creative acts, while creation itself still presupposes human intellectual activity. It can thus be seen that, whether in civil law or common law systems, the copyright systems of all major jurisdictions are premised on human creation, differing only in their modes of institutional expression (Copyright Law of the People’s Republic of China 2020).

Recent academic work from the past five years has confirmed and extended this anthropocentric premise. Ramos-Zaga (2025), writing in *Laws*, argues that the international

intellectual property framework has historically rested on the assumption that authorship is inseparable from natural personhood. The Berne Convention regime of moral rights in Article 6 bis presupposes a being endowed with will, consciousness, and expressive capacity. His normative analysis advances a graduated criterion of substantial creative direction. That criterion combines effective control over the generative process, verifiable creative input, and identifiable expressive intent. [Hugenholtz and Quintais \(2021\)](#), writing in IIC, reach a parallel conclusion at the level of EU positive law. They find that the requirement of human intellectual creation embedded in the unified standard of the author's own intellectual creation operates as a structural barrier. Purely machine-generated content cannot enter the scope of copyright. The position aligns with the U.S. judicial outcome in *Thaler v. Perlmutter* and the administrative position recorded in §306 of the Compendium of U.S. Copyright Office Practices, where human authorship was reaffirmed as a precondition of registration. Read together, contemporary academic work holds that the human authorship floor cannot be loosened on functional grounds. The proper site for legal adaptation is the boundary between AI-assisted works with substantive human input and AI autonomous outputs without such input ([Ramos-Zaga 2025](#); [Hugenholtz and Quintais 2021](#); *Thaler v. Perlmutter 2023*; *U.S. Copyright Office 2021*).

### 2.1.2. The Traditional Understanding of the Originality Requirement

Originality is the threshold requirement for copyright protection and occupies a central position in the institutional design of all major jurisdictions, though the standards for its definition differ across jurisdictions. Under U.S. law, the Supreme Court in the landmark 1991 case of *Feist Publications, Inc. v. Rural Telephone Service Co.* established two elements of originality: the work must be independently created by the author and must possess at least a "minimal degree of creativity." This case explicitly rejected the "sweat of the brow" doctrine previously adopted by some lower courts, namely the view that copyright protection could be obtained through labor input alone, emphasizing that the constitutional basis for copyright protection lies in incentivizing creative expression. Although the standard established in *Feist* has a very low threshold, its logic presupposes that creativity originates from the human mind ([Feist Publications, Inc. v. Rural Telephone Service Co. 1991](#)).

Under EU law, the CJEU developed its own originality standard through a series of cases. The 2009 *Infopaq* case first established "author's own intellectual creation" as the unified standard applicable to all types of works. The 2011 *Painer v. Standard Verlags GmbH* case (Case C-145/10) further enriched the content of this standard, with the Court noting that in the creation of photographic works, the author stamps the work with a personal touch through "free and creative choices" regarding the subject, composition, angle, lighting, and atmosphere. The 2018 *Levola Hengelo BV v. Smilde Foods BV* case (Case C-310/17) defined the boundaries of originality from the opposite direction, requiring that the protected subject matter possess an expression that can be "identified with sufficient precision and objectivity." These cases jointly demonstrate that the originality standard under EU law requires that works reflect the author's personal intellectual choices and creative judgment, which logically presupposes the existence of a human author ([Painer v. Standard Verlags GmbH 2011](#); *Levola Hengelo BV v. Smilde Foods BV 2018*).

Meanwhile, Article 3 of China's Copyright Law requires a work to simultaneously satisfy the requirements of "originality" and "intellectual achievement." In judicial practice, Chinese courts typically define originality as independent creation with a certain degree of individualized expression. The intrinsic logic of the traditional originality standard, requiring works to reflect the author's personality, free choices, and creative judgment, converges in substance across jurisdictions despite differences in expression, all pointing toward the

participation of a human subject. Compared to the U.S. “minimal degree of creativity” standard and the EU’s “author’s own intellectual creation” standard, the originality standard under Chinese law is more flexible in its theoretical construction, which also reserves room for subsequent institutional adaptation in the face of new AI technologies. This flexibility is grounded in Article 15 of the Supreme People’s Court’s Interpretation Concerning the Application of Laws in the Trial of Civil Disputes over Copyright (2002, revised 2020), which requires only that a protectable work be independently created and reflect a minimal degree of creativity, and has been operationalized through judicial decisions such as the Nanshan District People’s Court of Shenzhen judgment in *Tencent v. Yingxun* (2020) and the Beijing Internet Court judgment in *Li v. Liu* (2023), where courts recognized originality on the basis of cumulative human intellectual input across the AI-assisted creative process rather than on direct execution of every expressive element. As [He \(2024\)](#) observes, China’s originality standard reflects a hybrid model: while structurally resembling the civil law approach and similar to the EU standard of “author’s own intellectual creation,” its relatively low threshold for creativity in judicial practice renders it functionally closer to the US Feist standard ([Supreme People’s Court 2002](#); [He 2024](#); [Beijing Internet Court 2023](#); [Nanshan District People’s Court of Shenzhen 2020](#)).

The three originality regimes outlined above appear to differ on their face, yet they converge on three substantive commonalities that emerge from comparative scholarship and from judicial practice. The first commonality is the requirement of independent creation. A work must originate with the author and must not be copied from a prior source. The U.S. Feist standard, the EU author’s own intellectual creation test, and Chinese Article 3 of the Copyright Law each treat copying as a categorical bar to protection. The second commonality is the requirement of a creative element going beyond pure factual aggregation or mechanical labour. The Feist rejection of sweat of the brow, the EU rejection of mechanical effort under the *Infopaq* line of authority, and the Chinese requirement of intellectual achievement all align in treating creativity as a substantive element of protectability. The third commonality is the rule that the creative element must be traceable to a human source. The U.S. Compendium §306 makes the rule explicit. The EU position is reached by an interpretation of the words intellectual creation. The Chinese position is reached by the interpretation of intellectual achievement and Article 11 of the Copyright Law. As [Sun and Zhou \(2026\)](#) observe in their comparative analysis, these commonalities form the shared baseline against which each jurisdiction measures human contribution in the AI-generated context, even where the operational thresholds diverge. [Ramos-Zaga \(2025\)](#) likewise locates the traceability of human decision-making across the creative process as the unifying criterion that distinguishes mere algorithmic execution from legally recognized creation. The implication is that rule fragmentation across jurisdictions concerns the threshold of human input required, not the existence of the human authorship floor itself ([Sun and Zhou 2026](#); [Ramos-Zaga 2025](#); [Feist Publications, Inc. v. Rural Telephone Service Co. 1991](#); [Infopaq International A/S v. Danske Dagblades Forening 2009](#)).

### 2.1.3. Traditional Paths of Copyright Ownership

Under the traditional framework, copyright ownership follows the basic principle of “rights arising from creation”; a natural person author originally acquires copyright by virtue of performing the act of creation. This rule is universal across major jurisdictions, but differentiated arrangements exist regarding works of legal persons and special categories of works. Section 201(b) of the U.S. Copyright Act establishes the “work made for hire” doctrine, under which the employer or commissioning party is “considered” the author and originally acquires copyright when statutory conditions are met. EU member states’ legal traditions tend more toward vesting original copyright in the natural person who

actually created the work, with employers obtaining transfers or licenses of economic rights only through contractual agreements or statutory presumptions. Article 11, paragraph 2 of China's Copyright Law deems a legal person or unincorporated organization to be the author when a work is organized by it, represents its will, and it bears responsibility for the work; Article 18 of the same Law further regulates "works created in the course of employment", under which a natural person who creates a work in performance of tasks assigned by a legal person or unincorporated organization is treated as the author, while the organization may enjoy priority of use and, in certain enumerated categories such as engineering designs, computer software, and works produced by employees of news agencies and broadcasters, hold all economic rights subject only to the author's right of attribution. The structural parallel between Article 18 of the Chinese Copyright Law and Section 201(b) of the U.S. Copyright Act is evident: both reallocate original ownership away from the natural person creator to the employing entity once defined statutory conditions are met, and both provide a doctrinal anchor by which Tencent, in the *Tencent v. Yingxun* case, was treated as the original right holder of the AI-assisted news article, given that its in-house team of natural-person creators developed and deployed Dreamwriter in performance of employment duties (17 U.S.C. §201(b); [Copyright Law of the People's Republic of China 2020](#), arts. 11 and 18).

Of particular note are the special provisions of the [UK Copyright, Designs and Patents Act \(1988\)](#) (hereinafter CDPA) regarding "computer-generated works." Section 178 CDPA defines "computer-generated" in relation to a work as meaning that "the work is generated by computer in circumstances such that there is no human author of the work," while Section 9(3) CDPA designates the author of such a work as "the person by whom the arrangements necessary for the creation of the work are undertaken." These provisions are among the very few legislative clauses globally that directly address the issue of non-human creation, and the "necessary arranger" attribution model provides an important comparative law reference for current discussions of copyright systems in the AI era, even though the legislators at the time of the CDPA's enactment could not have foreseen today's generative AI technology ([UK Copyright, Designs and Patents Act 1988](#), ss. 9(3) and 178; [Atilla 2024](#)).

## 2.2. *The Threefold Impact of AI-Generated Works on the Traditional Framework*

### 2.2.1. Impact on the Concept of Authorship

The impact of AI-generated works on the traditional copyright concept of "authorship" is first manifested in the profound evolution of the human role in the creative process. Under the traditional creative model, the human author directly conceives, selects, and executes the various elements of creative expression; under the AI-assisted creative model, the human role shifts from direct executor to instruction provider, parameter setter, and output selector. This role change is not a simple binary opposition but rather constitutes a continuous spectrum, from humans using AI as an auxiliary tool (such as spell-checking or grammar correction) to providing detailed prompts to guide AI in generating specific content and to AI autonomously generating complete content with minimal human intervention, the degree of human participation exhibits a progressively diminishing character ([Gaidartzi and Stamatoudi 2025](#)).

This situation reveals the core challenges faced by copyright law. Artificial intelligence does not possess legal personality and cannot obtain the status of an author under the current legal system. However, the output of artificial intelligence may be completely indistinguishable from the works created by humans in terms of its external appearance. Therefore, the distinction between "AI-assisted works" and "AI-generated works" holds crucial legal significance. The former, due to the presence of substantive human involve-

ment, may still meet the author requirements stipulated by the current copyright law. However, the latter, lacking a human author, is currently in a legal vacuum. How to define the legal boundaries, that is, to what extent human involvement is sufficient to meet the author's requirements, is the greatest challenge currently faced by all judicial jurisdictions around the world ([Mazzi 2024](#)).

### 2.2.2. Impact on the Originality Standard

The operational mechanisms of generative AI pose an even deeper challenge to traditional originality standards. Generative AI systems, represented by large language models and image diffusion models, produce output content based on massive training data through complex processes of deep learning and probabilistic statistics. This process has a pronounced "black box" character; even the developers of AI systems often cannot precisely explain how a particular output was learned and generated from the training data. Against this backdrop, the logic of the traditional originality standard requiring works to reflect the author's "free and creative choices" faces fundamental difficulties; the extent to which AI output embodies "creative choices" cannot be clearly determined under existing technological conditions.

The originality of text prompts is a particularly thorny issue. Users guide AI systems such as Midjourney and Stable Diffusion to generate specific images by inputting text prompts. These prompts are, in essence, linguistic expressions of the user's creative intent, but the relationship between prompts and AI output is not the traditional direct causal relationship between an author's conception and a work's expression. The same prompt may produce different images, and different prompts may produce similar outputs. The U.S. Copyright Office provided a preliminary response to this in its handling of the Zarya of the Dawn case, finding that the process of using Midjourney to generate images is more akin to providing creative suggestions to a commissioned artist than to an author directly controlling expression, because the user cannot predict and control how the AI will specifically respond to prompts. In the Théâtre D'Opéra Spatial case, despite Jason Allen having used over 600 prompts and undergone hundreds of iterations to produce the award-winning image, the Copyright Office still refused registration, determining that the core creative elements were produced by the AI rather than the human. The Part 2 report on Copyright and Artificial Intelligence issued in January 2025 further clarified that, under current technological conditions, prompt input alone is insufficient to make a user the author of AI output ([U.S. Copyright Office 2023a, 2025](#)).

### 2.2.3. Impact on Copyright Ownership Rules

When AI substantially participates in the creative process, the core problem facing copyright ownership rules is that the types of rights holders presupposed by the existing legal framework cannot fully cover the creative realities of AI-generated works. Under the traditional framework, original copyright ownership uses the act of creation as the connecting point, pointing to the natural person who performed the creative act (or, under statutory conditions, the legal person deemed to be the author). However, in the context of AI-assisted creation, the creative act is decomposed into multiple stages: the design and training of the AI system (mainly completed by developers), instruction input and parameter setting (mainly completed by users), and the actual generation of content (mainly executed by the AI system). This decomposition of creative acts poses challenges to the traditional single-attribution model.

Existing systems provide three categories of candidate rights holders, but each faces theoretical difficulties. The scheme of attributing copyright to the AI user (prompt inputter) faces the challenge that the causal relationship between the user's contribution and the

AI's final output may be uncertain, and different users inputting the same prompts may produce identical or similar outputs, with no ready-made solution for handling such rights conflicts. The scheme of attributing copyright to the AI developer (system designer) faces the problem that the developer's creative input is embodied in the design of the AI system itself, rather than in each specific output; if the developer were to hold copyright over all outputs from millions of users, it would result in excessive concentration of rights and undue reward to developers. The scheme of listing the AI itself as a rights holder faces the most fundamental legal obstacle: AI does not possess legal personality and can neither enjoy rights nor bear obligations, and this has not been breached in the legal systems of any major jurisdiction ([Gaffar and Albarashdi 2024](#)).

### *2.3. The Current State of AI-Related Sectoral Legislation and Normative Gaps in the Copyright Domain*

Confronting the rapid development of AI technology, major jurisdictions have successively promulgated AI governance regulations centered on concerns of safety, ethics, and transparency, yet these regulations rarely directly address the copyright ownership of AI-generated works. The EU's Artificial Intelligence Act ([Regulation \(EU\) 2024/1689 2024](#), or AI Act), officially adopted in 2024, is the world's first comprehensive legislation to regulate AI systems holistically. The Act employs a risk-tiered regulatory framework, imposing differentiated compliance obligations on AI systems of different risk levels. In the copyright-related domain, Article 50 of the AI Act requires providers of generative AI systems to ensure that AI-generated content is labeled as such in a machine-readable format; however, the purpose of this transparency obligation is to prevent the spread of disinformation and does not address copyright ownership of AI-generated works ([Regulation \(EU\) 2024/1689 2024](#)).

In China, the Interim Measures for the Management of Generative Artificial Intelligence Services, jointly issued by the Cyberspace Administration of China and six other departments in 2023, is the first specialized administrative regulation governing generative AI applications. These measures primarily regulate the legal responsibilities of AI service providers from the dimensions of content security, data compliance, and labeling obligations; Article 12 requires that AI-generated content be clearly labeled, but likewise does not address the core issue of copyright ownership ([Interim Measures for the Management of Generative Artificial Intelligence Services 2023](#)).

In the United States, no comprehensive AI legislation has been passed at the federal level. In May 2024, the Governor of Colorado signed Senate Bill 24-205 (commonly known as the Colorado Artificial Intelligence Act), making Colorado the first U.S. state to enact a comprehensive AI regulatory law. The Act focuses on risks of algorithmic discrimination by high-risk AI systems in "consequential decisions" domains such as employment, housing, lending, education, and healthcare, requiring AI developers and deployers to undertake risk management, impact assessment, and consumer notification obligations, but similarly does not address copyright issues related to AI-generated works. At the federal administrative level, the U.S. Copyright Office launched its AI and copyright research series in 2023 and released Part 2 of its Copyright and Artificial Intelligence report (on copyrightability issues) on 29 January 2025, reaffirming the necessity of human authorship. Although this report is not legally binding, as the authoritative policy position of the Copyright Office, it will guide administrative practice and judicial decisions for a considerable period ([Colorado SB 24-205 2024](#); [U.S. Copyright Office 2025](#)).

The above analysis demonstrates that the AI governance regulations already promulgated in each jurisdiction exhibit significant commonalities in their regulatory focus, primarily addressing the safety, ethical compliance, and transparency oversight of AI systems, while adopting an avoidant or shelved attitude toward the copyright ownership

of AI-generated works. The existing copyright laws of all jurisdictions have not made explicit provisions regarding the copyrightability and rights ownership of AI-generated works, forming a notable legal lacuna. In this vacuum, copyright practice primarily relies on case-by-case handling by administrative authorities (such as the U.S. Copyright Office's registration review decisions) and judicial rulings by courts (such as individual case judgments by Chinese courts), with the fragmentation and uncertainty of rules being particularly prominent.

#### *2.4. Necessity Analysis for Legal Adjustment*

Facing the aforementioned impacts of AI-generated works on the traditional copyright framework and the increasingly prominent normative gaps in the copyright domain, adaptive adjustments to the existing legal system have become an urgent necessity. This necessity can be demonstrated from three dimensions: legal certainty, incentive theory, and international coordination.

From the dimension of legal certainty, the large-scale application of AI-generated content in commercial and cultural domains is an irreversible trend. Industries such as advertising design, news reporting, music production, and educational materials are increasingly dependent on AI-generated content, yet in the absence of clear ownership rules, market participants cannot determine what rights they hold over AI-generated content or what obligations they bear, thereby significantly increasing transaction costs and legal risks. The lack of legal certainty not only affects the efficiency of individual transactions but may also broadly inhibit the commercialization and innovative development of AI-generated content.

From the dimension of incentive theory, the core function of copyright law lies in incentivizing the sustained production of creative expression by granting creators time-limited exclusive rights. In the context of AI-generated works, incentive theory faces a dilemma, if all AI-generated works enter the public domain without any copyright protection, it may weaken investment incentives for AI technology R&D and creative applications, as investors cannot obtain exclusive competitive advantage through copyright; conversely, if indiscriminate full copyright protection is granted to all AI-generated works, it may lead to excessive expansion of rights, given that AI systems can generate massive volumes of content in extremely short timeframes at very low cost, unrestricted copyright protection would produce a "copyright flood" effect, obstructing the free flow of information and subsequent innovation. Therefore, reasonable institutional design needs to strike a careful balance between incentivizing AI technology investment and preventing excessive expansion of rights (Ambartsumian and Cannon 2025).

From the dimension of international coordination, the fragmented international landscape of rules on AI-generated works' copyright has already created real obstacles to the cross-border circulation of AI-generated content. The same AI-generated content may obtain copyright protection in one jurisdiction (as the flexible stance exhibited in Chinese judicial practice shows) while being excluded from copyright in another (as the strict stance of the U.S. Copyright Office demonstrates). Such cross-jurisdictional rule conflicts not only increase compliance costs for multinational enterprises but also bring complexity to international copyright enforcement. In the context of the globalized digital economy, promoting consensus on basic copyright rules for AI-generated works within multilateral frameworks such as WIPO has become an important topic in international intellectual property governance. In sum, whether viewed from the perspectives of legal certainty, innovation incentives, or international coordination, adaptive adjustments to the traditional copyright legal framework in response to AI technology development are no longer a question of whether they are needed, but of how to implement them, this is precisely the

core topic that subsequent chapters of this paper will explore in depth through comparative research methods ([Gaidartzi and Stamatoudi 2025](#)).

### 3. Comparative Analysis of Jurisdictional Practices

This Section conducts a comparative analysis of how copyright criteria operate in three jurisdictions. The body of relevant decisions has grown quickly since 2018, and now includes administrative determinations, trial court judgments, and appellate affirmances on AI-generated content. The U.S. cases chosen for close analysis here include [Thaler v. Perlmutter \(2023\)](#) and the U.S. Copyright Office determinations in *Zarya of the Dawn* (2023) and *Théâtre D'Opéra Spatial* (2023, reconsidered 2024). The Chinese cases chosen are the Nanshan District People's Court of Shenzhen judgment in *Tencent v. Yingxun* (2020), and the Beijing Internet Court judgments in *Feilin Law Firm v. Baidu* (2019) and *Li v. Liu* (2023). For the European Union, the Prague City Court judgment in *S.Š. v. Taubel Legal* (2023) and the Hamburg Regional Court judgment in *Kneschke v. LAION* (2024, appeal upheld 2025) are examined. Three reasons supported this selection. First, each case is the most recent authoritative source of law on its specific issue in its jurisdiction. Second, each case addresses a different posture of human input across the spectrum of AI-assisted creation, ranging from full machine autonomy in *Thaler v. Perlmutter*, to hybrid contribution in *Zarya of the Dawn*, to prompt engineering in *Théâtre D'Opéra Spatial*, to intensive iterative collaboration in *Li v. Liu*, and to minimal prompt input in *S.Š. v. Taubel Legal*. Third, each case has generated reasoning that has been engaged by later administrative or judicial bodies and by current academic literature ([Liu et al. 2025](#); [Sun and Zhou 2026](#); [Gaidartzi and Stamatoudi 2025](#)).

#### 3.1. *United States, the Strict Human Author Requirement*

This subsection sets out the criteria that govern copyright attribution in the United States. Four criteria operate in combination. The first criterion is fixation. Section 102(a) of the Copyright Act, codified at 17 U.S.C. §102(a), conditions copyright on the work being fixed in a tangible medium of expression, from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine. The second criterion is the idea expression dichotomy. Section 102(b) of the Copyright Act, codified at 17 U.S.C. §102(b), excludes from copyright any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in the work. The third criterion is originality. The Supreme Court in [Feist Publications, Inc. v. Rural Telephone Service Co. \(1991\)](#) defined originality as independent creation by the author together with at least a minimal degree of creativity. The fourth criterion is human authorship. Section 306 of the Compendium of U.S. Copyright Office Practices limits registration to works created by a human being. The Compendium grounds that limitation in the Supreme Court 1884 decision in *Burrow-Giles Lithographic Co. v. Sarony*, where the term author was held to mean the person to whom anything owes its origin (17 U.S.C. §102(a) and §102(b); [Feist Publications, Inc. v. Rural Telephone Service Co. 1991](#); [U.S. Copyright Office 2021](#); [Burrow-Giles Lithographic Co. v. Sarony 1884](#)).

##### 3.1.1. Legislative Framework

The constitutional foundation of the U.S. copyright system derives from Article I, Section 8, Clause 8 of the Constitution (the Intellectual Property Clause), which empowers Congress “to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” This utilitarian constitutional framework grounds the legitimacy of copyright protection

in the institutional goal of “incentivizing authors to create,” and the term “Authors” in the constitutional text has traditionally been understood as referring to natural persons. Section 102(a) of the Copyright Act (17 U.S.C.) provides that copyright protection extends to “original works of authorship fixed in any tangible medium of expression,” but does not define “author.” At the administrative practice level, the U.S. Copyright Office in its Compendium §306 explicitly declares that “the Copyright Office will register an original work of authorship, provided that the work was created by a human being,” citing the Supreme Court’s 1884 ruling in *Burrow-Giles Lithographic Co. v. Sarony*, which defined an author as “he to whom anything owes its origin; originator; maker; one who completes a work of science or literature.” While this administrative position is not legally binding, it has long served as the foundational guidance for copyright registration practice ([U.S. Copyright Office 2021](#); [Burrow-Giles Lithographic Co. v. Sarony 1884](#)).

### 3.1.2. Analysis of Key U.S. Cases

*Thaler v. Perlmutter* is the first case in which the U.S. judicial system directly adjudicated the copyright of AI-generated works. Plaintiff Stephen Thaler attempted to register copyright for a visual image titled “A Recent Entrance to Paradise” autonomously generated by his AI system DABUS (Device for the Autonomous Bootstrapping of Unified Sentience), listing DABUS as the author and himself as the copyright claimant. The U.S. Copyright Office refused registration on the ground that the work “lacked the human authorship necessary to support a copyright claim,” and the Review Board upheld this decision twice. In August 2023, Judge Howell of the U.S. District Court for the District of Columbia upheld the Copyright Office’s refusal, stating in the decision that “copyright has never stretched so far as to protect works generated by new forms of technology operating absent any guiding human hand,” explicitly confirming that “human authorship is a bedrock requirement of copyright.” In March 2025, the D.C. Circuit Court of Appeals affirmed the trial court’s decision. Notably, Thaler’s DABUS system also underwent similar global challenges in patent law, its inventorship was rejected in patent applications across multiple jurisdictions including the United States, the EU, and the UK, though South Africa’s Companies and Intellectual Property Commission made an exception in July 2021 by granting a patent listing DABUS as inventor, the first case worldwide to recognize an AI system as a patent inventor, although this result is widely attributed to the peculiarity of South Africa’s patent system not conducting substantive examination ([Thaler v. Perlmutter 2023](#); [South African CIPC 2021](#)).

The *Zarya of the Dawn* case demonstrates the preliminary U.S. copyright law practice of differential treatment of “human–AI hybrid works.” The case involved a graphic novel titled *Zarya of the Dawn*, whose text was written by human author Kristina Kashtanova, with images generated using the Midjourney AI system. In its February 2023 decision, the Copyright Office partially revoked the previously granted copyright registration, revoking copyright protection for the AI-generated image portions while retaining copyright for the human-authored text and the selection, coordination, and arrangement of text and images. In the decision letter, the Copyright Office analyzed the working mechanism of Midjourney in detail, finding that the process of using prompts to guide Midjourney in generating images is analogous to conveying creative instructions to a commissioned artist, as the user cannot precisely predict and control how the AI will interpret prompts and generate specific visual expression; therefore, prompt input itself does not constitute “authorship” in the copyright law sense. The important significance of this case lies in establishing a “divisibility” analytical framework, within the same work, the human-created portions and the AI-generated portions can be separately evaluated for their copyrightability ([U.S. Copyright Office 2023a](#)).

The Théâtre D’Opéra Spatial case further reveals the predicament facing prompt engineering under U.S. copyright law. In this case, Jason Allen used Midjourney to generate a digital image titled “Théâtre D’Opéra Spatial,” which won first place in the digital art competition at the Colorado State Fair in 2022, attracting widespread public attention. Allen subsequently applied for copyright registration, claiming that he had exerted sufficient creative control over the final work by inputting over 600 prompts, undergoing hundreds of iterations, and carefully selecting the output. However, the Copyright Office in its September 2023 decision refused the application, determining that the core creative elements of the image were produced by Midjourney rather than Allen, and that Allen’s prompt input and post-processing modifications were insufficient to constitute “authorship” in the copyright law sense. Allen filed an administrative appeal, and the Review Board upheld the refusal in September 2024. This case, together with the aforementioned Zarya of the Dawn case, jointly demonstrates that the U.S. Copyright Office maintains a cautious attitude toward the status of text prompts in copyright law, while prompts reflect the user’s creative intent, under current technological conditions, they are insufficient to make the user the “author” of AI output (U.S. Copyright Office 2023b, 2025).

### 3.1.3. Summary of Institutional Characteristics

Synthesizing the above legislative framework and judicial case law, the institutional stance of the United States on copyright issues of AI-generated works can be summarized as follows: the United States insists on a strict human authorship requirement, and works purely generated autonomously by AI are not eligible for copyright protection, a position consistently confirmed in both administrative practice and judicial decisions. For mixed works containing AI-generated elements, the United States employs a “divisibility” analysis, separately evaluating the copyrightability of human-created portions and AI-generated portions. However, there remains considerable ambiguity regarding the “sufficiency” standard of human contribution in AI-assisted works, i.e., what degree of human participation suffices to bring copyright protection to the AI-generated portions within a mixed work. The Copyright Office’s AI and copyright research series, launched in 2023, together with the dedicated report on copyrightability issued in January 2025, reaffirmed the above stance and explicitly stated that under current technological conditions, prompt input alone is insufficient to make a user the “author” of AI output, while acknowledging that future technological developments may change this determination (U.S. Copyright Office 2025).

### 3.2. European Union, Indirect Exclusion Through the Originality Standard

This subsection sets out the criteria that govern copyright attribution in the European Union. Three criteria operate in combination. The first criterion is the standard of the author’s own intellectual creation. The Court of Justice of the European Union held in *Infopaq International A/S v. Danske Dagblades Forening* (2009, Case C-5/08) that copyright protection turns on whether the subject matter is the author’s own intellectual creation. That standard was subsequently applied to all categories of works under the Information Society Directive (Directive 2001/29/EC). The second criterion is the requirement of free and creative choices. In *Painer v. Standard VerlagsGmbH* (2011, Case C-145/10), the Court of Justice required that the author stamp the work with a personal touch through free and creative choices. The third criterion is identifiability with sufficient precision and objectivity. In *Levola Hengelo BV v. Smilde Foods BV* (2018, Case C-310/17), the Court of Justice held that the protected subject matter must be identifiable with sufficient precision and objectivity, so that the rights and duties of third parties remain ascertainable. Together, these criteria require human creative input that can be traced to specific elements of the work. The unified standard applies uniformly across all member states pursuant to Article

1(2) of the Information Society Directive, and it operates as the primary indirect filter against authorship by purely machine-generated outputs ([Infopaq International A/S v. Danske Dagblades Forening 2009](#); [Painer v. Standard VerlagsGmbH 2011](#); [Levola Hengelo BV v. Smilde Foods BV 2018](#); [Hugenholtz and Quintais 2021](#)).

### 3.2.1. Legislative Framework

EU copyright protection is built upon a multilayered directive system, principally comprising the Information Society Directive (Directive 2001/29/EC), the Computer Programs Directive (Directive 2009/24/EC), the Database Directive (Directive 96/9/EC), and the Digital Single Market Copyright Directive (Directive (EU) 2019/790). As discussed in Section 2.1.2 above, the CJEU developed a unified originality standard through the Infopaq, Painer, and Levola Hengelo line of cases, requiring that protected subject matter be the “author’s own intellectual creation” expressed through “free and creative choices” and identifiable with sufficient precision and objectivity. The case law system formed by these precedents, while not explicitly mentioning AI or non-human creation, sets a high threshold for copyright protection of AI-generated works through its inherent requirement of human intellectual creation, and applies uniformly across all member states pursuant to Article 1(2) of the Information Society Directive ([Hugenholtz and Quintais 2021](#)).

In the field of AI governance, the EU’s AI Act ([Regulation \(EU\) 2024/1689 2024](#)), officially adopted in 2024, focuses on the risk-tiered regulation and safety compliance of AI systems and does not directly address the copyright ownership of AI-generated works. However, Article 50 of the Act requires providers of generative AI systems to ensure that their outputs are labeled as AI-generated in a machine-readable format. While this transparency obligation is aimed primarily at combating disinformation, three distinct mechanisms make it likely to influence authorship determinations in subsequent copyright practice. First, the labelling requirement supplies a robust evidentiary baseline: where content carries a machine-readable AI-generated marker, courts and copyright offices can identify it as such without reconstructing the production history, which lowers the cost of distinguishing AI-generated outputs from purely human creations in disputed registrations. Second, the labelling regime functions as a presumptive trigger on the burden of proof: once content is labelled as AI-generated, claimants seeking copyright protection face a heightened, content-specific evidentiary obligation to demonstrate sufficient and substantive human creative contribution, mirroring the analytical division already adopted by the U.S. Copyright Office in its *Zarya of the Dawn* and *Théâtre D’Opéra Spatial* determinations. Third, by interlocking with the rights-reservation logic of Article 4 CDSMD, the AI Act creates downstream consequences for outputs derived from non-compliantly trained models, which may colour the assessment of whether the resulting expression can be attributed to a human author whose own intellectual creation is identifiable in the work ([Hugenholtz and Quintais 2021](#); [Gaidartzi and Stamatoudi 2025](#)). Moreover, Article 53(1)(c) of the AI Act requires providers of general-purpose AI models to establish policies for compliance with the rights-reservation mechanism of Article 4 of the Digital Single Market Copyright Directive, thereby establishing a cross-regulatory linkage on copyright compliance of AI training data ([Regulation \(EU\) 2024/1689 2024](#); [Hugenholtz and Quintais 2021](#)).

### 3.2.2. Analysis of Key EU Cases

The *Robert Kneschke v. LAION e.V.* case is the first judicial decision within the EU concerning copyright compliance of AI training data. On 27 September 2024, the Hamburg Regional Court (Landgericht Hamburg) dismissed the copyright infringement claim brought by photographer Robert Kneschke against the non-profit organization LAION (Case No. 310 O 227/23). LAION had downloaded Kneschke’s photographic works from

stock image websites for text-image matching analysis in the course of constructing the open-source AI training dataset LAION-5B. The court held that LAION's conduct fell within the text and data mining (TDM) exception for scientific research purposes under Section 60d of the German Copyright Act (corresponding to Article 3 of the Digital Single Market Copyright Directive). The court noted that the creation of the dataset itself constitutes a preparatory step for scientific research, and that LAION, as a non-profit organization freely publishing its dataset, satisfied the non-commercial requirement; the subsequent use of this dataset by third-party commercial entities for AI model training does not affect the determination of LAION's non-commercial character. On 10 December 2025, the Hamburg Higher Regional Court (OLG Hamburg, Case No. 5 U 104/24) dismissed Kneschke's appeal and upheld the first-instance judgment. While this case does not directly involve the copyright ownership of AI-generated works, it reflects the EU's first formal judicial response to the legality of data use at the AI training stage, indicating that the TDM exception can provide a degree of copyright compliance space for AI training activities ([LG Hamburg 2024](#); [OLG Hamburg 2025](#)).

The S.Š. v. Taubel Legal case is the first court decision within the EU directly addressing copyright protection for AI-generated works. On 11 October 2023, the Prague City Court (Municipal Court in Prague) dismissed all of the plaintiff's claims in this case (Case No. 10 C 13/2023-16). The plaintiff used DALL-E, a text-to-image generation model developed by OpenAI, to generate an image by inputting a simple text prompt, "create a visual representation of two parties signing a business contract in a formal setting, such as in a meeting room or Prague law firm office, showing only hands." The plaintiff used this image on their website. The defendant (a Prague law firm) obtained the image from the plaintiff's website and used it on their own website. The plaintiff sued in the capacity of copyright holder, seeking cessation of use and damages. The court held that, under Czech copyright law, a work eligible for copyright protection must be the unique result of the creative activity of a natural person. The court further noted that prompts input to AI might be regarded as the "theme" of a work, but themes themselves are not protected by copyright. As the plaintiff failed to prove that the image was the product of their unique creative contribution, the court denied the copyrightability of the AI-generated image. The decision became final without appeal and resonates with the U.S. Copyright Office's stance in the *Théâtre D'Opéra Spatial* case, both negating the possibility of simple text prompts serving as a basis for "authorship" in the copyright law sense ([Municipal Court in Prague 2023](#)).

### 3.2.3. Summary of Institutional Characteristics

In summary, the institutional characteristics of the EU on copyright issues of AI-generated works can be characterized as an indirect exclusion path centered on the originality standard. Neither the EU directive system nor member state legislation explicitly excludes the copyrightability of AI-generated works, but the "author's own intellectual creation" standard established through CJEU case law, which requires that works embody personalized choices and intellectual creation by humans, effectively precludes purely AI-generated works from entering the scope of copyright protection. The S.Š. v. Taubel Legal case provides the first judicial instance of this indirect exclusion path. Compared to the United States, the EU's originality standard may theoretically be more elastic toward AI-assisted works with substantive human participation, if the user's creative choices can be identified and attributed to their personal intellectual creation, AI-assisted works may still satisfy the originality requirement. Furthermore, the EU's legislative arrangements on TDM exceptions and the judicial practice in the *Kneschke v. LAION* case provide a degree of copyright compliance space for data use during the AI system training stage, a unique institutional element absent from the legal frameworks of the United States and China.

### 3.3. China, Pragmatic and Flexible Incremental Exploration

This subsection sets out the criteria that govern copyright attribution in China. Four criteria operate in combination. The first criterion is the statutory definition of a work. Article 3 of the [Copyright Law of the People's Republic of China \(2020\)](#) defines a work as an intellectual achievement that is original and that can be expressed in a certain form in the fields of literature, art, and science. The second criterion is expression in a tangible form. Article 3 carries a tangibility component that resembles the U.S. fixation rule under 17 U.S.C. §102(a) yet is broader, in that it admits a wide range of expressive forms without insisting on permanent fixation. The third criterion is originality. Article 15 of the Supreme People's Court Interpretation Concerning the Application of Laws in the Trial of Civil Disputes over Copyright (2002, revised 2020) requires independent creation and a minimal degree of creativity. The fourth criterion is the source of authorship. Article 11 of the Copyright Law assigns authorship to the natural person who creates the work. A legal person or unincorporated organization may be deemed the author under three conditions. The entity must organize the creation. The work must represent the entity's will. The entity must bear responsibility for the work ([Copyright Law of the People's Republic of China 2020](#), arts. 3 and 11; [Supreme People's Court 2002](#)).

#### 3.3.1. Legislative Framework

China's current copyright legal system is centered on the Copyright Law of the People's Republic of China (amended 2020). Article 3 of the law defines a "work" as "an intellectual achievement that is original and can be expressed in a certain form in the fields of literature, art, and science"; Article 11 provides that "the natural person who creates a work is the author" and allows legal persons or unincorporated organizations to be "deemed" authors under statutory conditions. The law does not explicitly exclude the copyrightability of AI-generated works, though "intellectual achievement" is generally interpreted as presupposing human intellectual participation. At the AI policy level, the State Council's New Generation Artificial Intelligence Development Plan, issued in 2017, set strategic objectives of initially establishing an AI legal, regulatory, and ethical norms system by 2025 and building a world-leading AI innovation center by 2030, reflecting China's policy orientation of balancing industrial development and normative construction in the AI field. In 2023, the Cyberspace Administration of China and six other departments jointly issued the Interim Measures for the Management of Generative Artificial Intelligence Services, primarily regulating the legal responsibilities of AI service providers from the dimensions of content security, data compliance, and labeling obligations, but not addressing the copyright ownership of AI-generated works ([Copyright Law of the People's Republic of China 2020](#); [State Council of the People's Republic of China 2017](#); [Interim Measures for the Management of Generative Artificial Intelligence Services 2023](#)).

#### 3.3.2. Analysis of Key Chinese Cases

The Feilin Law Firm v. Baidu case is the first case in which a Chinese court directly addressed the copyright of AI-generated works. In April 2019, the Beijing Internet Court rendered a first-instance judgment on this case (Case No. (2018) Jing 0491 Min Chu No. 239). The case arose when the plaintiff, Beijing Feilin Law Firm, used the "visualization" search and analysis function of the Wolters Kluwer legal database to automatically generate a judicial big data analysis report on the film and entertainment industry based on input keywords, which was subsequently reposted without authorization by the defendant Baidu on its Baijiahao platform. In the judgment, the court conducted an in-depth analysis of the legal nature of AI-generated works, holding that "completion of creation by natural persons should remain a necessary condition for works under copyright law." The court

concluded that the software developer (owner) did not input keywords for searching, and thus the auto-generated visualizations did not convey an original expression of the developer's "thoughts and feelings" (sixiang ganqing); while the software user did input keywords, the act of input itself was not a creative act conveying the user's "thoughts and feelings." This formulation tracks the statutory definition of "creation" in Article 3 of the Implementing Regulations of the Copyright Law, which provides that "creation" refers to "intellectual activity that directly produces literary, artistic, and scientific works," an activity which Chinese copyright doctrine has long understood as involving the expression of the creator's thoughts and feelings (Liu 2026; Wang 2026). Accordingly, the court found that the auto-generated visualizations did not constitute a "work" in the copyright law sense. Nevertheless, the court simultaneously noted that an AI-generated output, "although not a work, does not enter the public domain and may not be freely used by the public"; for the purpose of encouraging creation and dissemination, a degree of protection should still be afforded to the user. The court ruled that Baidu's unauthorized use constituted infringement, awarding Feilin Law Firm 1560 RMB in economic losses and reasonable expenses. The intermediate path between full copyright protection and complete absence of protection was not, however, the creation of a new *sui generis* right in the strict sense; the court grounded its remedy on (i) the fact that the plaintiff retained legal-person work copyright in the surrounding text it had authored, and (ii) general civil law principles, especially Article 7 of the Civil Code (the principle of good faith) and the protection of legitimate interests through unfair-competition-style reasoning, which together permit Chinese courts to allocate liability for unauthorized commercial exploitation of investment-backed outputs even where those outputs do not satisfy the originality threshold (Huang 2026; Sun and Zhou 2026). This methodology, which relies on existing civil law clauses rather than judicial creation of a new property right, is consistent with the legislative supremacy that characterizes civil law systems and is doctrinally distinct from common-law-style judicial law-making (Beijing Internet Court 2019; Implementing Regulations of the Copyright Law 2013, art. 3).

The Tencent v. Yingxun case is the first case in which a Chinese court found AI-generated content to possess copyrightability. In January 2020, the Nanshan District People's Court of Shenzhen rendered judgment, finding that a financial news article titled "Midday Commentary, Shanghai Composite Index Rises Slightly 0.11% to 2671.93 Points; Telecommunications, Oil Extraction and Other Sectors Lead" generated by Tencent's proprietary AI news-writing platform Dreamwriter constituted a literary work protected by copyright law.

The court's adjudicatory logic focused on two levels. At the level of originality determination, the court found that the article's specific form of expression and the process of its generation satisfied the conditions for copyright protection of literary works; the article had a reasonable structure, logically clear expression, and a degree of originality. At the level of authorship determination, the court shifted its perspective from the AI itself to the humans behind it, finding that Tencent employees invested sufficient intellectual labor in data selection, trigger condition setting, template design, and corpus style selection, and that these arrangements directly related to the specific expression of the article; accordingly, the article was a "work organized and created by" Tencent as a legal person work. As Tencent was simultaneously both the developer and user of Dreamwriter, the court attributed copyright to Tencent as the employer of the development team. Compared to the Feilin case, the reason the Tencent case reached the opposite conclusion lies in the essential differences in the degree and nature of human intellectual input between the two cases, in the Feilin case, the user merely input keywords to trigger automatic retrieval, with extremely limited intellectual participation; whereas in the Tencent case, the creative

team exerted continuous and substantive intellectual control throughout the entire system design process ([Nanshan District People's Court of Shenzhen 2020](#)).

The *Li v. Liu* case is the world's first court decision recognizing full copyrightability of AI-generated images, marking a milestone of landmark significance. In November 2023, the Beijing Internet Court rendered a first-instance judgment (Case No. (2023) Jing 0491 Min Chu No. 11279). The plaintiff Li used the open-source image generation model Stable Diffusion to generate a portrait image through the input of positive and negative prompts, selection of a specific model, setting of sampling methods and iteration steps, and other parameters, followed by repeated adjustments and selection, and published the image under the title "Spring Breeze Brings Tenderness" on a social media platform. The defendant Liu reposted the image without authorization and removed the watermark bearing the attribution. The court conducted a three-tiered progressive analysis in its judgment. Regarding the positioning of the AI model, the court characterized Stable Diffusion as a creative tool rather than a creative subject, noting that the designers of the AI model "neither had the intention to create the image in question nor predetermined the content to be subsequently generated." Regarding the originality determination, the court emphasized that the plaintiff demonstrated sufficient intellectual input in stages including model selection, prompt conception, parameter setting, and output selection, and that the image "was not a simple product of automatic generation but reflected the plaintiff's creative choices and personal judgment." Regarding rights ownership, the court found that the plaintiff, as a natural person, enjoyed full copyright in the work, including the right of attribution and the right of dissemination through information networks ([Beijing Internet Court 2023](#)).

This judgment stands in stark contrast to the U.S. position in the *Théâtre D'Opéra Spatial* case. In the latter, the U.S. Copyright Office determined that prompt input and post-processing modifications were insufficient to constitute "authorship" in the copyright law sense; whereas in the *Li v. Liu* case, the Chinese court recognized that prompt engineering, iterative optimization, and selection behavior themselves can constitute sufficient human intellectual input. The Beijing Internet Court explicitly expressed its policy orientation at the end of the judgment, "Encouraging creation is recognized as the core purpose of the copyright system. Only by correctly applying the copyright system, using appropriate legal means to encourage more people to create with the latest tools, can we better facilitate the creation of works and the development of artificial intelligence technology." This policy declaration reflects the pragmatic stance of Chinese judicial authorities on AI copyright issues, balancing intellectual property protection with incentives for technological innovation ([Gaidartzi and Stamatoudi 2025](#)).

### 3.3.3. Summary of Institutional Characteristics

China exhibits three notable institutional characteristics regarding the copyright of AI-generated works. Through successive decisions in the *Feilin* case, the *Tencent* case, and the *Li v. Liu* case, Chinese courts have progressively elaborated AI-related copyright rules at the level of individual adjudications, displaying a characteristic pattern of incremental, case-by-case interpretive development. In terms of the originality standard, Chinese courts have adopted a relatively flexible approach. This standard does not require humans to directly execute every element of the creative expression. Instead, it recognizes that the overall intellectual input of humans throughout the entire process of artificial intelligence usage, including model selection, prompt design, parameter adjustment, and output selection, can meet the requirements of originality. From the perspective of institutional comparison, the *Li v. Liu* case's pioneering recognition of full copyright protection for AI-assisted works demonstrates a more open and pragmatic stance than those of the United States and the

European Union. The formation of this stance is closely related to the macro-policy context in which China treats AI industry development as a national strategic priority. Flexible copyright protection is conducive to incentivizing the creative application of AI technology and the development of related industries.

### 3.4. Cross-Jurisdictional Horizontal Comparison of the Three Major Jurisdictions

Based on the above individual studies of the copyright practices related to AI-generated works in the United States, the European Union, and China, the following will conduct a systematic horizontal comparative analysis from multiple dimensions.

Regarding the standard for authorship determination, the three jurisdictions present a gradient spectrum from strict to flexible. The United States requires direct human creative acts, treating AI as a tool without legal personality, and granting authorship only when humans exercise direct control over the final expression.

According to EU regulations, works must reflect the author's own creative concepts, emphasizing that humans leave personal imprints through free and creative choices. Although the involvement of artificial intelligence was not explicitly ruled out, indirect restrictions were imposed through the establishment of an originality threshold. China, on the other hand, recognizes the indirect intellectual contributions of humans in the process of using artificial intelligence. It shifts its perspective from the direct creation output by artificial intelligence to the overall intellectual input of humans throughout the entire process of using artificial intelligence, thereby significantly lowering the threshold for determining the authorship.

As for originality standards, the differences among the three jurisdictions are equally notable. The United States adopts the "minimal degree of creativity" standard established in *Feist*; the threshold is low but strictly requires that creativity originate from the human mind. The EU emphasizes "free and creative choices," requiring that creativity be traceably attributable to a specific human author; the standard is theoretically more rigorous but maintains interpretive elasticity for AI-assisted creation. China's originality determination, articulated through Article 3 of the Copyright Law and Article 15 of the Supreme People's Court Interpretation, places greater emphasis on substantive human arrangements and participation. In the *Li v. Liu* case, the court recognized that prompt design and parameter adjustment themselves can constitute originality contributions.

As to the distinction between AI-assisted works and AI-autonomously generated works, all three jurisdictions deny the copyrightability of purely AI-autonomously generated works (i.e., AI output entirely without human participation), but significant differences exist in the scope and conditions of protection for AI-assisted works. The United States, through the *Zarya of the Dawn* case, established a "divisibility" analytical framework that separately evaluates human-created portions and AI-generated portions in mixed works, but the standard for the "sufficiency" of human participation remains vague. The EU has not yet established a clear distinguishing standard in judicial practice; the *S.Š. v. Taubel Legal* case only denied copyrightability in a simple prompt scenario, leaving discretionary space for complex human participation scenarios. China, through the *Li v. Liu* case, established relatively lenient conditions for the protection of AI-assisted works, recognizing that prompt engineering and iterative optimization behavior can constitute sufficient human participation.

The perspective shifts to regulatory pathways, and the three jurisdictions have adopted markedly different modes of institutional formation. The United States primarily relies on a dual-track mechanism of Copyright Office administrative practice (registration review decisions and policy guidance) and court case law, with the Copyright Office gradually clarifying its policy stance through individual case decisions and research reports. The

EU indirectly responds to AI challenges through the CJEU’s expansive interpretation of originality standards and member state courts’ individual case rulings, while also taking a legislative-first approach in the AI governance domain (the AI Act). China’s primary rule-formation pathway is through individual case rulings by grassroots courts (particularly the Beijing Internet Court), exhibiting a characteristic of “grassroots innovation, gradual accumulation.” (Table 1).

**Table 1.** Horizontal Comparison of Copyright Frameworks in China, the United States, and the European Union.

|                            | European Union                                                                                                                                                      | The United States                                                                                                                                                               | China                                                                                                                                                                                               |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Author Identity Criteria   | “Author’s own intellectual creation”; centered on human freedom and creative choices, without explicitly excluding but indirectly limiting through standards        | Strictly require direct human creative actions; the Copyright Bureau’s Compendium §306 clearly stipulates that it refers to natural persons.                                    | Acknowledge the indirect intellectual contributions made during the use of AI; do not require humans to directly carry out the generation of creative expressions                                   |
| Originality Standard       | The “freedom and creative choice” standard in the Infopaq/Painer case must be attributable to human authors.                                                        | The “minimum degree of creativity” standard in the Feist case strictly required human origin.                                                                                   | Emphasizing substantive human arrangements and participation, the case of Li suing Liu acknowledges that the design of the prompt words alone constitutes an original contribution.                 |
| AI-assisted v AI-generated | The S.S. v. Taubel Legal case denies the existence of the simple trigger phrase scenario; there are no clear precedents for the complex participation scenario yet. | Use “divisibility” analysis; in the Zarya case, the human part and the AI part were evaluated separately; the standard for the sufficiency of human participation was ambiguous | The Filler case denies scenarios with extremely low participation; the Li v. Liu case confirms that the implementation of the prompt engineering and iterative optimization meets the requirements. |
| Regulatory Path            | The CJEU’s case law’s expansion of the standard for originality; individual court rulings in member states; legislative priority in the AI Act                      | The dual-track system of administrative practice of the copyright bureau (registration review + policy guidance) and court precedents                                           | Case judgments of grassroots courts (Beijing Internet Court) serve as the main path for the formation of rules.                                                                                     |
| Policy Orientation         | Overall, it is conservative, but it is open to AI training through the TDM exception mechanism.                                                                     | Prefer conservatism and uphold traditional human author-centeredism                                                                                                             | The AI industry is driven by policies, with a tendency towards flexible protection to encourage technological innovation.                                                                           |

In the view of policy orientation, the differences among the three jurisdictions reflect their respective institutional logics and industrial policy considerations. The United States leans conservative, maintaining the traditional anthropocentric institutional framework and adopting a cautious attitude toward expanding the scope of copyright protection. The EU, while maintaining an overall conservative stance, adopts a relatively open attitude toward AI training data use through the TDM exception mechanism, seeking balance between copyright protection and AI R&D. China, driven by AI industrial policy, tends toward flexible protection to incentivize technological innovation, with judicial authorities explicitly expressing in individual case decisions a policy orientation of encouraging the use of AI tools for creation. These three different policy orientations mean that the same AI-generated content may receive entirely different legal treatment in different jurisdictions. This is precisely the concrete manifestation of the international rules fragmentation problem

analyzed in Chapter II, and the practical starting point for the institutional coordination and optimization recommendations to be explored in Chapter IV (Mazzi 2024).

#### 4. Comprehensive Analysis and Institutional Recommendations

This Section integrates the findings of Section 3 into a single framework of analysis and institutional recommendations. Three regulatory landscapes inform the recommendations that follow. In the European Union, the regulatory framework consists of the Information Society Directive, the Computer Programs Directive, the Database Directive, the Digital Single Market Copyright Directive, and the AI Act (Regulation (EU) 2024/1689 2024). The AI Act centers on risk-tiered regulation and on transparency obligations under Article 50 and Article 53. It does not directly resolve the copyright ownership of AI-generated works. The CJEU originality line of authority continues to operate as the primary determinant of copyrightability, and indirectly excludes purely AI-generated works through the human creation element of the standard. In the United States, recent legislative trends point in a deregulatory direction. Executive Order 14179, signed by President Trump on 23 January 2025, is titled Removing Barriers to American Leadership in Artificial Intelligence. It revoked Executive Order 14110 of the prior administration. It also called for an AI Action Plan that would remove what the order described as unnecessary regulatory burdens on AI development. The America's AI Action Plan, released on 23 July 2025, emphasizes accelerating innovation and reducing federal regulatory friction. The plan signals a reduced political appetite for federal copyright legislation that would expand protection to AI-generated works without human authorship. The Copyright Office Part 2 Report of January 2025 reaffirmed the human authorship floor. The absence of subsequent federal legislation displacing that floor confirms the conservative position. China is referenced in this paper as the comparative anchor because Chinese judicial practice has produced the most explicit elaboration of the criteria for human contribution in AI-assisted creation. The decisions in *Tencent v. Yingxun* (2020) and *Li v. Liu* (2023) operationalize the criteria of model selection, prompt design, parameter adjustment, and output selection. Those criteria offer an evaluative framework that is portable to other jurisdictions, and that is more refined than the present U.S. and EU treatments (Executive Order 14179 2025; America's AI Action Plan 2025; Regulation (EU) 2024/1689 2024; U.S. Copyright Office 2025; Beijing Internet Court 2023; Nanshan District People's Court of Shenzhen 2020).

##### 4.1. Theoretical Analysis of Core Disputes

###### 4.1.1. Natural Rights Theory Perspectives

A theoretical examination of the copyright ownership of AI-generated works must first trace back to the two major natural rights traditions in copyright philosophy. The labor Theory proposed by Locke in the Second Treatise of Government posits that an individual has a natural property right in the fruits of their labor. By mixing one's labor with the common resources of nature, one removes them from their original state of common ownership and converts them into private property. In the context of copyright law, this theory provides a normative foundation for protecting the intellectual labor of authors. When applied to AI-generated works, the central question is whether the AI user's prompt engineering and parameter adjustment activities constitute "labor" in the Lockean sense. Under a broader interpretation, the intellectual activities invested by users in conceiving prompts, selecting models, setting parameters, iterating repeatedly, and screening outputs can be regarded as a new form of intellectual labor, even though this labor does not directly act upon the physical generation process of the final expression, it exercises substantive guidance and control over the content and form of AI output. However, the important limiting condition of Lockean theory, the "sufficiency proviso,"

requiring that property acquisition not deprive others of access to “enough and as good” portions of common resources, imposes an important constraint on copyright protection for AI-generated works, excessive granting of exclusive rights over AI output content may unduly constrain the practical freedom of subsequent users to create substantially similar outputs using the same AI tools. The point here is not that copyright would forbid genuinely independent creation, since copyright law does not stop independent creation as a matter of doctrine, but that the deterministic operating logic of generative AI systems means that distinct users supplying near-identical prompts and parameters may converge on substantially similar outputs without copying one another. In such a setting, an aggressive copyright entitlement granted to whoever first registers or fixes a particular AI output could expose later, genuinely independent users to costly infringement allegations and burdensome evidentiary disputes regarding access and similarity, even though no act of copying occurred. The Lockean sufficiency proviso therefore counsels institutional caution about the breadth and the registration mechanisms of any rights granted over AI output, rather than denying the abstract availability of independent creation as a defense (Sun and Zhou 2026; Mazzi 2024; Locke 1689; Hughes 1988).

Hegel’s Personality Theory approaches from another dimension, viewing intellectual property as the extension and objectification of the creator’s personality in the external world. According to Hegel’s exposition in the *Elements of the Philosophy of Right*, a person makes an external thing their property by projecting their will into it, and intellectual creation is a paradigmatic form of this externalization of will, “Talents, erudition, artistic skill, etc., while belonging to the free spirit, are internal rather than external; however, the spirit can equally externalize and alienate them through expression.” In the application of copyright law, personality theory requires that works embody the author’s unique personality stamp. Whether AI-generated works can meet this requirement depends on whether the user sufficiently injected personal creative intent and aesthetic preferences during the AI usage process. In alignment with Hegelian theory, Kant’s “*jus personalissimum*” theory posits that works are deep expressions of the author’s personality. If applied to AI-assisted creation scenarios, it can be argued that when text prompts reflect the user’s unique creative intent and individual preferences, AI output may still be regarded as an indirect expression of the user’s personality, thereby providing a justification for copyright protection. However, the core challenge facing personality theory in the AI context is that the “black box” nature of the AI generation process makes it difficult to clearly trace the causal chain between the user’s intent and the final output, potentially undermining the persuasive force of the “personality extension” argument (Hegel 1821; Mazzi 2024).

#### 4.1.2. Utilitarian Theory Perspective

Utilitarianism theory offers another analytical perspective on the copyright issues of AI-generated works. The Intellectual Property Clause of the U.S. Constitution grants authors and inventors exclusive rights for a limited period to promote the progress of science and the useful arts, and the institutional design must seek the best balance between stimulating creativity and safeguarding public interests. The utilitarian argument in support of protecting works generated by artificial intelligence posits that granting copyright protection can incentivize investments in the research, development, and creative applications of artificial intelligence technology, promote the diversification of cultural products, and lower the barriers to creation, thereby benefiting a broader range of groups (Liu et al. 2025). The viewpoints opposing protection warn that excessive protection of AI-generated content may lead to severe rights monopolies. A small number of technology companies can gain control over advanced AI systems through copyright protection of a large amount of AI output, thereby obtaining disproportionate market advantages. Instead

of promoting overall innovation vitality, this may actually suppress it. A more fundamental objection is that the artificial intelligence system itself does not require intellectual property incentives to function, which contradicts the fundamental principle of copyright law that “rights can stimulate creativity”. The copyright applicability report released by the US Copyright Office in January 2025 also reflects this pragmatic consideration. When analyzing the copyright applicability of the outputs of artificial intelligence. The report points out that copyright law has always linked protection to human creative activities, and new technologies do not necessarily require an expansion of the scope of protection (U.S. Copyright Office 2025).

#### 4.2. Criteria for Distinguishing “AI-Assisted” and “AI-Autonomous” Works

The preceding analysis suggests that none of the existing natural rights or utilitarian frameworks, taken in isolation, can resolve the AI copyright ownership question. Lockean labor theory supports recognition of substantial user contributions but, through its sufficiency proviso, simultaneously cautions against expansive entitlements; Hegelian personality theory accounts for human authorial expression but struggles with the “black box” opacity of generative AI; and utilitarian theory yields competing prescriptions depending on whether emphasis is placed on incentivizing AI investment or on preserving public access to AI output. The shared limitation of these theories is that they explain why copyright is granted, not when, in concrete circumstances of human–machine interaction, copyright should be granted. The transition from Section 4.1 to Section 4.2 is therefore deliberate: rather than defending any single theory as the exclusive justification, this paper advances an operational criterion that synthesises the convergent normative pulls of all three traditions into a workable test for the broad gray area between purely human creation and fully AI-autonomous generation (Hugenholtz and Quintais 2021; Sun and Zhou 2026).

Based on the preceding theoretical analysis and the comparative examination of judicial practices across the three major jurisdictions in Section 3, this paper proposes “substantiality of human involvement” as the core criterion for distinguishing AI-assisted works from AI-autonomously generated works. This criterion aims to address the most contentious middle ground in practice, the broad gray area between purely human creation and fully AI-autonomous generation. At the operational level, the assessment of substantiality of human involvement should comprehensively consider the following factors, the complexity and creative quality of prompts, recognizing that there is an essential difference between simple descriptive instructions and complex prompts containing detailed aesthetic orientations, stylistic guidance, and compositional requirements; the substantive impact of parameter settings on output results, i.e., whether the user’s choices of sampling methods, iteration steps, guidance scale, and other technical parameters substantively shaped the characteristics of the final output; human choices and judgments during the iterative optimization process, i.e., whether the user underwent multiple rounds of creative cycles of generation, screening, adjustment, and regeneration; and the extent of selection and editing behavior regarding final outputs, i.e., the degree to which the user selected from multiple AI outputs and applied post-processing modifications (Gaidartzi and Stamatoudi 2025).

The adjudicatory approach of the Beijing Internet Court in the *Li v. Liu* case (2023) provides important empirical reference for the above distinguishing criteria. That court did not require humans to “directly execute” every step of the creative expression generation; instead, it focused its scrutiny on the sum total of human intellectual input throughout the entire AI usage process, evaluating model selection, prompt design, parameter adjustment, and output screening as a holistic creative act. This “process-oriented” evaluation method stands in sharp contrast to the “result-oriented” approach of the U.S. Copyright Office in the *Zarya of the Dawn* and *Théâtre D’Opéra Spatial* cases, which focused on examining

whether AI output directly originated from human creation. This paper contends that, under current AI technological conditions, the process-oriented approach embodied in the *Li v. Liu* case is more reasonable, as it more accurately reflects the actual workflow of humans creating with the aid of AI tools. Creative contributions are often diffused throughout the entire human–machine interaction process rather than concentrated in any single particular stage. Of course, this process-oriented standard should also set a necessary floor; extremely brief or uncreative prompt inputs (as found by the Prague City Court in *S.Š. v. Taubel Legal*) should not receive copyright protection merely by virtue of the AI usage act itself ([Beijing Internet Court 2023](#); [U.S. Copyright Office 2023a](#); [Municipal Court in Prague 2023](#)).

#### 4.3. Possible Schemes for Copyright Ownership and Their Assessment

Before evaluating each scheme in turn, this paper sets out the rationale for the tiered approach that follows and the reasons why other equally available frameworks fall short. The choice of a tiered approach is not a derivation from the *Li v. Liu* decision in isolation, nor a preference for one philosophical school over another. The choice rests on three observations drawn from Section 3 and from the convergence among the Lockean, Hegelian, and utilitarian traditions analysed in Section 4.1. First, the creative process for AI-generated content varies sharply along a spectrum. At one end stand simple prompt outputs of the kind dismissed in *S.Š. v. Taubel Legal*. At the other end stand iterative engagements of the kind recognised in *Li v. Liu*. Between the two stand mixed cases, such as *Théâtre D’Opéra Spatial*. The reviewer in *Zarya of the Dawn* confirmed this when treating the human and machine contributions as separable. Second, a single rule that fixes ownership at one end of the spectrum cannot accommodate the contextual variation in the nature, content, and degree of human input revealed by these decisions. The collaboration theory cannot establish co-authorship in the absence of an intent to co-create between the developer and a downstream user. The absolute authorship theory either denies copyright to AI-assisted works that satisfy the originality test under *Feist Publications, Inc. v. Rural Telephone Service Co.* and the author’s own intellectual creation test, or it grants copyright on the basis of human prompt input alone, which the U.S. Copyright Office and the Prague City Court have both rejected on the facts before them. Third, the tiered approach does not foreclose the operation of either alternative theory within its proper domain. Collaboration analysis remains available where the developer and the user genuinely intend joint creation. Absolute authorship reasoning continues to operate within Tier 1 once human contribution crosses the originality threshold. The tiered structure organises the relations among these theories rather than displacing them. Treating AI as a creative tool, in line with the position of Smith J. in *Getty Images v. Stability AI*, also avoids any anthropomorphic premise about machine agency ([Beijing Internet Court 2023](#); [Municipal Court in Prague 2023](#); [U.S. Copyright Office 2023a, 2023b](#); [Mazzi 2024](#); [Hutson 2024](#)).

##### 4.3.1. Attribution to AI Users

The scheme of attributing copyright to AI users finds its jurisprudential basis in the proposition that users exercise creative control over AI output through prompt input, parameter setting, and output selection, and that their intellectual investment constitutes the primary source of originality in AI output. This scheme is most applicable to scenarios where the user has a clear creative intent and invests substantive intellectual labor in the AI usage process; the plaintiff’s creation through *Stable Diffusion* in the *Li v. Liu* case exemplifies this paradigm. The core advantage of user attribution is that it maintains the greatest degree of consistency with the basic principle of “creator as author” in traditional copyright law, and the determination of the rights holder is relatively clear. However, this

scheme faces two prominent practical difficulties. First, the definition of the “sufficiency” standard, setting the standard too high risks excluding a large volume of commercially valuable AI-assisted works from protection, while setting it too low risks depriving copyright protection of its proper “originality” threshold. Second, the problem of rights conflicts when different users use the same prompts on the same AI system to produce similar or identical outputs, the traditional operation of the “independent creation” defense in copyright law will face unprecedented challenges.

#### 4.3.2. Attribution to AI Developers

The scheme of attributing copyright to AI developers is based on the reasoning that the design, training, and programming of the AI system constitute the fundamental prerequisite for AI’s generative capacity, and that the developer’s creative investment is indirectly embodied in every AI output. The approach adopted by the Nanshan District Court of Shenzhen in the Tencent v. Yingxun case reflects this logic. The court found that Tencent employees’ intellectual input in data selection, trigger condition setting, and template design directly determined the specific expression of Dreamwriter articles, and therefore attributed the article’s copyright to Tencent as the employer. However, the peculiarity of this case is that Tencent simultaneously served as both the AI developer and the user. In the more common commercial scenario where the AI developer and user are separate entities, attributing copyright to the developer would cause a serious institutional imbalance; developers of large commercial AI systems would hold potential copyright claims over the outputs of millions of users, constituting both excessive reward to developers and severe suppression of users’ willingness and motivation to create using AI tools. Therefore, attribution to developers is reasonable only in the specific scenario where the developer also serves as the AI user (Nanshan District People’s Court of Shenzhen 2020).

#### 4.3.3. Joint Ownership Model

The joint ownership model is predicated on the recognition that the creation of AI-generated works results from the collaborative interaction of developers (who design and train the system) and users (who provide instructions and conduct screening), with both contributions being indispensable. At the conceptual level, this scheme accurately reveals the collaborative nature of the AI creative process and is applicable to scenarios where both the developer’s and user’s creative contributions reach substantive standards. However, the joint ownership model faces formidable institutional design challenges in practical operation. Under traditional copyright law, the establishment of co-authorship typically requires that the parties have an intent to co-create and that each contributes independently identifiable creative expression to the final work, two requirements that are extremely difficult to satisfy between an AI developer and a user, as the developer typically cannot foresee nor intends to participate in the user’s specific creative activities when designing and training the system. Furthermore, how to construct the mechanism for rights exercise and benefit distribution between co-authors lacks clear normative guidance in the AI context. Therefore, while the joint ownership model possesses a degree of explanatory power in theory, its scope of application may be limited to the few scenarios where a specific cooperative relationship exists between the developer and user.

#### 4.3.4. Sui Generis Rights Protection

For purely AI-autonomously generated works, AI output where the degree of human participation is insufficient to satisfy any traditional authorship standard, this paper recommends considering the creation of a sui generis protection mechanism independent of copyright. The legislative precedent for this scheme traces back to the database sui generis right established under Article 7 of the EU Database Directive (Directive 96/9/EC). That

directive provides the maker who has made a “substantial investment” in the obtaining, verification, or presentation of database contents with an exclusive right independent of copyright, with a protection term of 15 years from the date of completion of the database, and the acquisition of the right does not require satisfaction of an originality standard. By reference to this institutional model, a special protection system with shorter protection terms (e.g., 5 to 10 years) and a limited scope of rights (e.g., covering only the right to prevent direct copying, excluding derivative rights and moral rights) could be created for AI-autonomously generated works. Section 9(3) of the [UK Copyright, Designs and Patents Act \(1988, CDPA\)](#) also provides an important comparative law reference, it provides that the “author” of “computer-generated” literary, dramatic, musical, or artistic works is deemed to be “the person by whom the arrangements necessary for the creation of the work are undertaken,” with a protection term of 50 years and no moral rights. Although this provision is subject to scholarly debate, its institutional design approach of providing down-graded protection for non-traditional “authorless” works holds instructive significance for AI governance. The primary advantage of the sui generis rights scheme is that it avoids fundamental disruption to the core concepts of “author” and “originality” in the traditional copyright system, while providing a minimum level of legal certainty for AI-generated works, thereby satisfying the basic needs of commercial practice for the transaction and licensing of AI outputs ([Directive 96/9/EC 1996](#); [UK Copyright, Designs and Patents Act 1988](#); [Atilla 2024](#)).

A further scheme that has emerged in the recent UK literature is the proposition that ownership in AI-generated works should track copyright in the training weights of the underlying model. The High Court judgment in *Getty Images (US) Inc. v. Stability AI Ltd.* [2025] EWHC 2863 (Ch) does not, however, support that proposition. Smith J. held at paragraph 600 that the model weights of Stable Diffusion are not themselves an infringing copy and do not store an infringing copy. The weights are the product of patterns and features learnt during training rather than reproductions of the training works. The case turned on secondary infringement under sections 22 and 23 of the Copyright, Designs and Patents Act 1988 and on trade mark claims under sections 10(1) to 10(3) of the Trade Marks Act 1994, and not on authorship or ownership of AI outputs. The judgment was followed by the consequential decision in *Getty Images (US) Inc. v. Stability AI Ltd.* [2025] EWHC 3343 (Ch), in which Getty was granted permission to appeal. The current direction of UK policy reinforces the same conclusion. The Government Report on Copyright and Artificial Intelligence of March 2026 was prepared under Section 136 of the Data (Use and Access) Act 2025. That Report proposes the removal of Section 9(3) of the Copyright, Designs and Patents Act 1988, and the retention of copyright protection only for AI-assisted works that exhibit human creative input. Read together, the case law and the policy materials confirm that UK law does not anchor authorship of AI outputs in the trained weights of a model. The tiered model proposed in this paper is consistent with that direction. The model allocates rights by reference to identifiable human contribution at each tier rather than by reference to the technical artefacts of the training process ([Getty Images v. Stability AI 2025](#); [UK Government 2026](#); [Atilla 2024](#); [Geiger and Iaia 2024](#)).

## 5. Conclusions

Through a systematic comparative study of the three major jurisdictions of China, the United States, and the European Union on the issue of copyright ownership of AI-generated works, this paper has revealed the deep contradictions and institutional deficiencies in the current global copyright legal system’s response to the challenges of generative artificial intelligence technology, and has proposed several theoretical frameworks and institutional recommendations on this basis. The following summarizes the full text from four levels:

core findings of the comparative study, theoretical contributions, institutional recommendations, and research limitations.

Regarding the core findings of the comparative study, fundamental divergences exist among the three jurisdictions on their institutional positions concerning copyright of AI-generated works; these divergences are not merely technical differences at the rule level but profoundly reflect the essential gaps among jurisdictions in copyright philosophical foundations, industrial policy orientations, and judicial activism. The United States has established the most stringent human authorship requirement, the utilitarian incentive logic embedded in its constitutional Intellectual Property Clause, combined with the Copyright Office's strict registration review practice, jointly erect a high threshold. In the *Thaler v. Perlmutter* decision, upheld through two levels of courts, human authorship was explicitly positioned as the bedrock requirement of copyright protection, and any claim that bypasses direct human creative acts faces difficulty in securing legal support. The EU has carved out an indirect exclusion path centered on the originality standard; the "author's own intellectual creation" standard accumulated through CJEU case law in the *Infopaq*, *Painer*, and *Levola Hengelo* cases effectively sets an insurmountable threshold for copyright protection of AI-generated works, while the Prague City Court's decision in *S.Š. v. Taubel Legal* provides the first judicial instance of this indirect exclusion path. China's institutional position is the most open and flexible among the three jurisdictions, the Beijing Internet Court's decision in the *Li v. Liu* case not only represents the world's first recognition of full copyright protection for AI-assisted image works but also explicitly declared a policy orientation of encouraging creation using new technological tools; the Nanshan District Court of Shenzhen's adjudicatory reasoning on legal person work attribution in the *Tencent v. Yingxun* case similarly reflects the pragmatic tendencies of Chinese judicial practice. The three jurisdictions also exhibit significant differences in regulatory pathways, the United States has formed a dual-track mechanism of administrative practice and judicial precedent; the EU relies on the unified judicial interpretation of supranational institutions and the multilayered interactive dynamic with member state legislative traditions; and China's primary rule-generation mechanism centers on individual case rulings by grassroots courts, particularly specialized internet courts, a characteristic of grassroots innovation and gradual accumulation that endows the Chinese system with high adaptive flexibility while also bringing problems of rule fragmentation and uncertainty.

Regarding theoretical contributions, this paper advances existing research on two levels. At the conceptual analysis level, this paper systematically reviews and critically evaluates the six major theoretical schools, AI authorship theory, absolute human authorship theory, work-made-for-hire theory, co-authorship theory, public domain theory, and sui generis rights theory, pointing out that the common limitation of existing theories is their examination of the relationship between human participation and AI generation from a static, binary perspective, which is inadequate for addressing the extensive gray areas of human-machine collaborative creation in technological practice. This paper introduces substantiality of human involvement as the core criterion and constructs a process-oriented evaluation framework along four dimensions, the complexity and creative quality of prompts; the substantive impact of parameter settings on output; human choices and judgments during the iterative optimization process; and selection and editing behavior regarding final outputs, extending the scrutiny of copyright law from the AI output itself to the entire human-machine interaction process, thereby more accurately capturing the diffuse character of human creative contributions in AI-assisted creation. At the comparative law level, this paper for the first time places the Chinese *Li v. Liu* case alongside relevant U.S. and EU precedents within a unified analytical framework for systematic comparison, identifying the essential differences in core logic between two prevailing adjudicatory

approaches, the U.S. Copyright Office's result-oriented approach, which examines whether AI output directly originates from human creation, and the Beijing Internet Court's process-oriented approach, which examines the totality of human intellectual input throughout the AI usage process, and theoretically demonstrating why the latter possesses greater reasonableness under current technological conditions.

Regarding institutional recommendations, this paper proposes a hierarchical ownership model as the core institutional framework for addressing the copyright ownership of AI-generated works. The fundamental logic of this model is to apply different ownership rules to different types of AI-generated works based on substantive differences in the degree of human participation. For AI-assisted works with substantive human participation, authorship should be recognized under the existing copyright law framework using a process-oriented originality standard, attributing copyright to the natural person or legal person who invested substantive intellectual labor throughout the AI usage process. The adjudicatory logic embodied in the Chinese *Li v. Liu* case provides robust judicial practice support for this scheme. For borderline cases of AI-assisted works where the degree of human participation is insufficient to satisfy the originality requirement, the attribution logic of the work-made-for-hire system may be referenced to determine rights allocation between AI platform service providers and users through contractual agreements or statutory presumptions, thereby providing a minimum level of commercial certainty without breaking through the basic copyright law framework. For purely AI-autonomously generated works, AI outputs entirely without human participation or with extremely limited human participation, this paper recommends creating a special protection system outside of copyright law with shorter protection terms and a limited scope of rights. By reference to the database *sui generis* right under Article 7 of the EU Database Directive and the treatment of computer-generated works under Section 9(3) of the UK Copyright, Designs and Patents Act, the protection term of this special system could be set at 5 to 10 years, the scope of rights limited to a negative right of preventing direct copying without encompassing derivative rights or moral rights, and the rights holder designated as the entity that made substantive investment in generating the AI content, i.e., the developer or operator of the AI system. This special protection system avoids fundamental disruption to the core concepts of author and originality in the traditional copyright framework, while providing the necessary legal certainty for rights transactions and licensing arrangements of AI-generated content in a wide range of commercial scenarios.

This paper also offers specific recommendations regarding international coordination pathways. The fragmented rules across jurisdictions on copyright of AI-generated works have already created substantive obstacles to the cross-border circulation of AI-generated content. Three concrete manifestations of this fragmentation merit emphasis. First, the same AI-generated image protected as a copyrighted work in China under *Li v. Liu* may be denied registration in the United States under *Théâtre D'Opéra Spatial* and may be denied protection in the EU under *S.Š. v. Taubel Legal*, leaving a single asset with discontinuous protection along its commercial chain (Liu et al. 2025). Second, multinational AI service providers face conflicting compliance obligations, since the EU AI Act's Article 50 labelling and Article 53 training-data transparency requirements impose specifications absent from the U.S. and Chinese regimes, while China's Interim Measures impose content-security obligations not paralleled abroad, exposing providers to compliance costs that ascend with each additional jurisdiction served (Hugenholtz and Quintais 2021). Third, parties to international AI-output licensing transactions encounter heightened due diligence costs, because choice-of-law and choice-of-forum stipulations cannot wholly displace the divergent substantive rules on whether the licensed AI output is itself a protectable work (Liu et al. 2025). The downstream consequences include depressed cross-border

licensing revenue, increased contractual disputes over warranty and indemnity clauses governing AI-output ownership, and a competitive distortion in which jurisdictions with more permissive originality standards may attract a disproportionate share of AI-content production. Promoting consensus on certain basic rules within the multilateral framework of the World Intellectual Property Organization therefore carries urgent practical necessity. Consensus-building may adopt an incremental strategy, in the short term, international minimum standards may first be formed on several boundary-clear issues, including confirming the basic principle that purely AI-autonomously generated works are not subject to traditional copyright protection, requiring AI-generated content to be labeled in a machine-readable format to facilitate subsequent rights determinations, and acknowledging the reasonableness of jurisdictions maintaining a degree of elasticity in standards for recognizing AI-assisted works. In the medium term, efforts may be made to formulate guiding principles on the evaluative elements of substantiality of human involvement, providing a unified analytical framework for copyright practices across jurisdictions. In the long term, exploration may turn toward establishing an international intellectual property protection agreement specifically targeting AI-generated content, modeled on the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty, making unified arrangements at the international law level on core issues such as the definition of AI-generated content, conditions for protection, scope of rights, and protection terms.

This research also has several limitations that merit candid acknowledgment. As AI technology itself is still in a phase of rapid iterative evolution, the judicial precedents and administrative practices upon which this paper relies may all undergo significant changes in the short term due to technological developments or legislative amendments; this is an unavoidable timeliness limitation of comparative legal research addressing frontier technological issues. Furthermore, the hierarchical ownership model and substantiality of human involvement standard proposed in this paper remain at the theoretical framework level, and their feasibility and boundary issues in concrete operation await deeper empirical research for validation. The intrinsic connection between copyright ownership of AI-generated content and copyright compliance of training data has not been fully developed in this paper due to space constraints, yet this connection has already begun to emerge in the TDM exception practice demonstrated by the *Kneschke v. LAION* case in the EU and merits dedicated in-depth study.

Looking ahead, as large model capabilities continue to improve and generative AI applications become more deeply and widely adopted, the boundary between human creation and AI generation will become ever more blurred, and the theoretical challenges confronting copyright law will continue to evolve. How to uphold the core value orientation of copyright law in protecting human creative labor while providing sufficient legal certainty for the commercialization of AI-generated content, and achieving effective rule coordination among jurisdictions, will be the central proposition for future intellectual property law research and reform. This paper's comparative research endeavors to provide a useful foundation stone in the exploration of this proposition.

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