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Review

Authorship and Ownership Issues Raised by AI-Generated Works: A Comparative Analysis

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Abstract

Artificial intelligence (AI) is transforming the creative landscape and challenging traditional copyright frameworks historically focused on human authorship. As AI-generated works become increasingly common, legal systems worldwide are confronted with urgent questions about originality, ownership, and liability. While most jurisdictions adhere to the principle of strict human authorship, a growing trend toward more flexible policies recognizes the transformative potential of these technologies in the creative sectors. This paper examines the complexities and ambiguities of the current copyright systems regarding art created by AI, highlighting the varied international legal approaches and the philosophical discussions surrounding authorship and creativity.

Keywords: artificial intelligence; intellectual property law; copyright law; AI ethics; AI regulation; AI-generated works

1. Introduction

Artificial intelligence (AI) is reshaping global industries, economies, and creative processes, much like other technological revolutions have done, such as the introduction of industrial automation and the Internet. AI-based systems that generate text, music, images, and even complex software code have opened new possibilities but also raised legal and ethical questions about copyright and intellectual property (IP) rights. As AI-generated content becomes increasingly sophisticated and resembles human creations, the issues of ownership, originality, and authorship necessitate immediate attention.

AI as a tool for creative production challenges fundamental principles of copyright law, which have historically rested on human creativity and intellectual effort. Originality, authorship, and the protection of human ingenuity are traditional copyright concepts that become difficult to apply when AI autonomously creates artistic and literary works. This particular distinction is often drawn between works merely assisted by AI, in which human input influences the output, and works fully generated by autonomous AI systems, where human involvement is minimal. Worldwide, current legal systems are uncertain about whether AI-generated works receive copyright protection, and if so, who should be considered the rightful owner—the AI developer, the user providing input prompts, or even the AI itself. These legal issues have created a fragmented international landscape, with jurisdictions adopting very different approaches. Some jurisdictions, such as the United States of America (US) and the European Union (EU), require human authorship

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for copyright protection, while others, such as China, are starting to recognize AI-assisted works under certain conditions.

This paper examines the legal issues raised by AI-generated content, varying across jurisdictions; key court cases that have shaped the debate; and potential solutions for a more harmonized international framework. The study has the following key sections: first, an overview of the current legal and ethical issues posed by AI; second, the existing copyright laws and their application to AI-generated works, along with an analysis of landmark legal cases that are pushing the boundaries of copyright law in the context of AI; finally, some possible legal reforms and policy recommendations for a more coherent approach to the copyrightability of AI.

2. Navigating AI Copyrightability: Key Legal and Ethical Challenges

With an established conceptual basis for AI, this section shifts from defining AI to discussing its implications for copyright. AI technologies, and in particular generative models, have recently demonstrated great capabilities in writing, generating high-quality images, and other media (Ahuja 2020, pp. 270–74). The tension between traditional copyright frameworks based on human authorship and AI-driven computational creativity requires an in-depth analysis of how copyright law can respond to such challenges posed by AI. This section explores the three most commonly raised critical issues at the intersection of AI and copyright—copyright protection for training data, the need for and extent of human involvement, and authorship or ownership of generated content (Bukhari and Hassan 2023, pp. 649–51; Hutson 2024, pp. 888–93)—by reviewing the existing literature and case law on the challenges and implications of AI-generated works, with a focus on authorship.

2.1. Training Data: The Backbone of AI Creativity

The first central issue at the intersection of technology and intellectual property law is identified before content is created: the incorporation of copyrighted material in the training of AI models. AI systems are typically trained on large datasets that contain the vast majority of copyrighted works, including text and images. This in turn creates systems that produce high-performance works but also raises major legal and ethical questions. At the heart of the issue is the desire of copyright holders to protect their creations, while proponents of AI innovation see the transformative potential of these technologies (Kupferschmid 2024). Examples include *Andersen v Stability AI* (Williams 2024), an ongoing case that will be analyzed further in a subsequent section.

Some of these challenges in the European context are allegedly addressed (whilst it is not clear whether this was initially one of the purposes) by the 2019 Directive on Copyright in the Digital Single Market (CDSM), and in particular by text and data mining (TDM). As defined in the Directive, TDM is "any automated analytical technique aimed at analyzing text and data in digital form in order to generate information which includes, but is not limited to, patterns, trends and correlations" (Directive (EU) 2019, art. 2). The same Directive also contains two crucial exceptions relevant to AI models and copyright holders—Article 3, which allows TDM for scientific research purposes, and Article 4, which grants this permission for any purpose, commercial or non-commercial, as long as rights holders have not "opted out" or "contracted out" (Margoni and Kretschmer 2022, pp. 694–95). Unsurprisingly, these opt-out provisions have been criticized for having the opposite effect to that intended, namely giving copyright owners more discretion over access. The TDM framework shows that the EU is trying to balance the interests of creators and innovators, although its implementation remains a challenge. As no legislative change will be possible before June 2026, the CDSM Directive is unlikely to be reviewed before then. In the meantime, the legal landscape for TDM—especially for publicly funded research

institutions—remains complex and constrained by legal access requirements, contractual strategies, and technological barriers (Szkalej 2024, pp. 15–18).

Parallel avenues for dealing with copyrighted material used to train AI models are provided in US law under the fair use doctrine. This flexible yet complex legal framework considers whether copyrighted material can be used without explicit permission if the work produced is transformative. The assessment has four components—the purpose and character of the use, the nature of the copyrighted work, the amount and substantiality of the portion used, and the effect of the use upon the potential market for or value of the copyrighted work (United States Code 2023, tit. 17 U.S.C. § 107). The adaptability of the fair use doctrine is clearly advantageous in that US courts, as opposed to their European counterparts, can respond much more quickly without frequent legislative updates. Parallel to this, numerous court cases involving AI systems and digital companies have invoked the fair use doctrine, often with mixed results (Roos 2023, pp. 39–40), creating what some have named a "fair use crisis" (Sobel 2017). The divergence between US and EU court approaches reflects the balance between encouraging innovation and protecting IP rights (Hutukka 2023). Fair use has many benefits for technological progress, but its application to AI training practices and outputs remains a developing area of law. Nevertheless, the full range of international copyright laws need not be considered in this subsection, as they will be examined separately through the prism of particular case studies.

2.2. AI and Human Involvement: A Prerequisite for Copyright?

The question of whether human intervention is an indispensable condition for copyright protection remains one of the most contentious questions at the intersection of AI and IP law. AI-generated works generally fall under two broad classifications—those created with significant human input, where AI is a tool to achieve human-directed ends, and those created autonomously by AI systems with little or no human input (Hristov 2017, pp. 435–36). Evidently, works in the former category satisfy traditional copyright requirements—such as the need for originality, typically interpreted as human intellectual effort—while works in the latter pose more complex philosophical and ethical questions surrounding the notions of creativity, intention, and accountability existing independently of human authorship. Nevertheless, the distinction between these two categories is not always easy to define; certain outputs result from a blend of human instruction and autonomous generative processes, resulting in hybrid works that render binary classifications complicated. The legislative response to this issue varies between legal jurisdictions, with some requiring a substantial human contribution before copyright protection is granted and others adopting a more lenient approach towards computer-generated works (Selvadurai and Matulionyte 2020).

Historically, human authorship has been heavily stressed in US copyright law. The U.S. Copyright Act does not explicitly address AI-generated works, but the stance of the U.S. Copyright Office is particularly relevant. The most recent edition of the Compendium of U.S. Copyright Office Practices states that, "The U.S. Copyright Office will register an original work of authorship, provided that the work was created by a human being" (U.S. Copyright Office 2021, § 101.1(A)). Cases supporting this position include *Thaler v Perlmutter*, which will be reviewed in a subsequent section. It is, however, worth noting that the U.S. District Court upheld the Copyright Office's refusal to register an AI-generated artwork, demonstrating that human creativity remains a core element of copyright law (Rezek 2024, pp. 194–97). Despite this high level of legal clarity, purely autonomous AI-generated works are not protected and could create legal loopholes as AI systems become more capable of independent creation (Blaszczyk et al. 2024).

Compared to the US, the United Kingdom (UK) adopts a more inclusive position, explicitly defining computer-generated works in the Copyright, Designs and Patents Act (CDPA) (Copyright, Designs and Patents Act (CDPA) 1988). Specifically, Section 9(3) of the CDPA provides that, "In the case of a literary, dramatic, musical or artistic work which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken" (Copyright, Designs and Patents Act (CDPA) 1988, c. 48). This particular perspective is also reflected in the legislation of other countries, including New Zealand (Copyright Act 1994 1994, sec. 5 (2)) and Hong Kong (Cap. 528 Copyright Ordinance 1997, sec. 11 (3)). As noted in Section 9, the protection of these works has been limited in practice to date, and there is no judicial guidance as to who created the work (Intellectual Property Office of the United Kingdom 2022). A notable case, *Nova v Mazooma Games* (*Nova Productions Ltd v Mazooma Games Ltd & Ors (CA)* 2007), has been cited in the literature as an example of the application of Section 9, and this case seems to suggest that the court decided that the programmer was most likely the author (Dickens et al. 2024). While this demonstrates greater receptivity to AI-generated content, critics argue that it dilutes the traditional notion of authorship by shifting attention from human creativity to the logistical role of those who help create it, namely programmers (Atilla 2024), an issue that will be analyzed in more detail in the next subsection.

The EU, on the other hand, takes a more nuanced approach, focusing on originality as the basis for copyright protection. The Court of Justice of the European Union (CJEU) clarified the EU's originality criterion in the *Infopaq* case, stating that, "Copyright within the meaning of Article 2(a) of Directive 2001/29 is liable to apply only in relation to a subject-matter which is original in the sense that it is its author's own intellectual creation" (*Infopaq International A/S v Danske Dagblades Forening* 2009). Subsequent cases, namely *Levola Hengelo BV v Smilde Foods BV* (*Levola Hengelo BV v Smilde Foods BV* 2018) and *Cofemel v G-Star Raw* (Cofemel—Sociedade de Vestuário SA v G-Star Raw CV 2019), have confirmed this interpretation, namely that originality must derive from the author's own creative choices and not from technical or functional limitations (SI and Brompton Bicycle Ltd v Chedech/Get2Get 2020). At first sight, this framework implies human intellectual input and therefore excludes purely AI-generated works from the originality threshold under EU law. In contrast, it allows AI-assisted works, where human input is a major part of the creative process, to potentially receive protection, an attempt by the EU to balance human creativity with technological innovation (Gaffar and Albarashdi 2024; Hugenholtz and Quintais 2021). Those who oppose claim that the EU's approach fails to deal with AI-generated works. A central point of contention is the definition of "authorship," which advocates for a more inclusive reading that recognizes the collaborative nature of modern creation and the dynamic nature of creativity for all those who have made substantial contributions to the creative process (Denicola 2016, pp. 269–70). Nevertheless, this particular reassessment and its contributions provide the foundation for the analysis in the following sections and is revisited in in the final section (Section 4) of this paper.

2.3. AI-Generated Creativity: Navigating Legal Uncertainties in Ownership and Authorship

Authorship has historically been correlated with a "substantial contribution" to a work, regardless of the field or jurisdiction. Foundational instruments such as the Berne Convention (World Intellectual Property Organization 1986) and landmark cases such as the *Infopaq* decision (*Infopaq International A/S v Danske Dagblades Forening* 2009) have set the trajectory of copyright protection towards originality as the product of human intellectual effort (Rosen 2022, pp. 482–85). However, AI-generated works have challenged these long-standing norms, as they represent artistic outputs created without direct human intervention, relating to the issues raised in the previous sections concerning training data

and human contribution (Lin 2024). The authorship of AI systems is complex because they work with large datasets, often derived from third-party copyrighted material. In addition, autonomously produced works—without sufficient human involvement—generally do not meet the originality threshold in most jurisdictions and end up in the public domain. As noted, AI-assisted works could receive copyright protection, with the interaction between training data and human contribution, thus, being at the heart of the current debate over authorship in the AI era.

Although AI systems cannot be considered legal authors under current law, the question of who can claim ownership among the humans involved remains open. Potential copyright owners generally fall into one of the three categories—the programmer, the user, or the owner of the training data. The first category, which can also include the company that developed the AI, can claim authorship for all the creative and technical work that went into creating the AI. This approach seems to be consistent with the long-term goal of sustainable innovation in AI (Hristov 2017, pp. 443–45); however, some scholars have argued that the work produced by an AI program is only "second-generation work," as it is only indirectly derived from the creative work of the programmer, and the author of the AI is not directly involved in the content produced (Miernicki and Ng 2021). The second approach benefits the user of the AI system if their input is sufficient enough to shape the work. It should be noted that user involvement is extremely critical, as the input of a simple prompt, for example, is unlikely to meet the threshold for authorship (White and Matulionyte 2019, pp. 15–16). The final approach focuses on the owner of the training data, especially if copyrighted material is used to train the AI model, potentially making the end product a derivative work (Gans 2024, pp. 2–6; Lemley 2023, pp. 202–8).

These issues illustrate how AI-driven creativity is collaborative, blurring the line between the programmer, the user, and the data owner. As AI continues to redefine creativity, courts are being called upon to resolve such issues, often guided by the above considerations. The next section examines the current legal landscape and considers landmark cases that have shaped the copyrightability of AI-generated works.

3. AI on Trial: The Legal Status of Machine-Generated Creativity

AI tools used to produce creative works have shaken the traditional foundation of copyright law based on human authorship. While some jurisdictions have clarified the matter at hand by adapting their laws to reflect today's technological advances better, others remain tied to old notions of human creativity (Bötticher 2019, p. 41). This section analyzes these different approaches by classifying jurisdictions into three main groups—restrictive frameworks with rigid requirements for human authorship, moderately flexible systems that recognize certain exceptions in AI-generated works, and more forward-looking jurisdictions that actively promote AI technologies and have even protected some AI-assisted works. The analysis of these approaches illustrates the international and often national differences in legal interpretation and the difficulty of adapting the existing copyright laws to the new AI technologies. Building on the legislative foundations outlined in the previous section, this part focuses specifically on case law and national practices that demonstrate the application of these legal theories in practice.

3.1. The Good, the Bad, and the Complex: AI Copyright in a Divided World

3.1.1. Guardians of Human Creativity: The Restrictive Approach

The first category comprises legal systems considering human authorship necessary for copyright protection. These legal frameworks strictly adhere to conventional notions of originality and creativity, granting copyright protection only to works produced by direct human ingenuity. Such legal systems include those of the US and Australia, which heavily

rely on human authorship to exclude AI-generated works from copyright protection. This section explores their legal frameworks and interpretations, highlighting the limitations of restrictive approaches to AI in creative processes.

US copyright law is founded on utilitarian principles, under which copyright protection is a motivation for artists and inventors to produce works for society (Office of Policy and International Affairs 2024; Constitution of the United States 1789, art. I, § 8, Cl. 8). As noted in Section 2.2, US law requires human intellectual effort to establish protection of the work's originality. Despite the fact that 17 U.S. Code § 102 does not explicitly address AI-generated works or their copyrightability, the U.S. Copyright Office has explicitly stated that purely AI-generated works are not eligible for copyright protection unless they reflect sufficient human involvement (United States Code 2023). It is, however, worth mentioning that the "work made for hire" under the amended U.S. Copyright Act of 1976 allows an employer or commissioning party to be considered the author and owner of a work created by an employee or under contractual obligation. Although this provision presumes that a human is the creator, it has led to some speculation as to whether AI-generated works produced during the course of employment could be protected indirectly, a theory that remains legally unresolved (Zhuk 2023). In essence, US law continues to uphold the principle that human authorship is a fundamental prerequisite for copyright protection.

The graphic novel *Zarya of the Dawn*, first granted copyright protection in 2022, is a prominent example of how US copyright law continues to rely on human authorship. In early 2023, the U.S. Copyright Office revoked the registration for the AI-generated illustrations, citing a perceived lack of human intellectual contribution, but retained copyright protection for the text and arrangements written by a human being (*Zarya of the Dawn* 2023). This case highlights the Office's strict threshold for recognizing works created by autonomous systems and applying the human authorship standard. Nevertheless, even the Copyright Office indicates that it is open to protecting works created by AI systems if human intervention is deemed sufficient, the precise level of which remains unclear (Begemann and Hutson 2025, pp. 5–6). The *Zarya of the Dawn* ruling stated that text prompts and modifications to AI outputs were not sufficient to qualify generated images as works of authorship (Wyczik and Wieczerzak 2024, p. 46). As there are no explicit provisions in US copyright law that regulate AI-generated works, courts are likely to follow the approach of the Copyright Office in such cases where human contribution is negligible or absent. In early 2023, the U.S. Copyright Office launched an initiative to examine current copyright law and policies, issuing a three-part report, with the most recent part focusing on copyrightability, further stressing the need for sufficient human contribution (Uribe 2023, pp. 78–81; Sandiumenge 2023, pp. 60–65; United States Copyright Office 2025).

Australia's copyright framework, governed by the Copyright Act of 1968, places great emphasis on human authorship as a fundamental protection principle, a position somewhat similar to that of the US, albeit more flexible. It should be noted that copyright is not a registered right in Australia. Instead, it is up to the claiming party to prove that the required elements of copyright—authorship and originality—are present. Copyright protection under the Act includes any "literary, dramatic, musical or artistic work" expressed in "material form" and considered "original" and sufficiently connected to Australian jurisdiction (Copyright Act 1968 1969, para. 31). In other words, the anthropocentric nature of Australian copyright law, which is consistent with the Berne Convention (World Intellectual Property Organization 1986, art. 3), creates severe difficulties for AI-generated works (Australian Copyright Council 2023). Following the 1984 introduction of computer programs as "literary works," the Copyright Law Review Committee initiated the 1995 Computer Software Protection Report, which established Australia's position on computer-assisted and computer-generated works (Copyright Law Review Committee of Australia 1994),

proposing that traditional copyright principles should apply to computer-assisted works. In addition, it proposed the creation of a new class of Part IV subject matter, consisting of "computer-generated materials" without identifiable human authors. Although this represented a progressive recommendation, the Australian Copyright Council (ACC) opposed it, favoring the human authorship requirement for Part III works and the limitation of the rights for AI-generated materials under Part IV (Copyright Act 1968 1969, pt. IV). Ultimately, the ACC's position was upheld, further demonstrating Australia's commitment to balancing technological innovation with the principles of human authorship (White and Matulionyte 2019, pp. 228–32; Rocco 2021; Fitzgerald and Seidenspinner 2013, pp. 45–48).

Without definitive rulings from either the Australian or US courts on the copyrightability of AI-generated works, it seems that both jurisdictions agree that creations without identifiable human authorship are unlikely to be protected. Although both legal systems are fundamentally based on human intellectual effort, Australia has shown a greater openness to exploring potential reforms, as demonstrated, for example, by the various public consultations and government-led reviews. As AI technologies improve and their role in the creative industries grows, the courts will inevitably have to address these unresolved issues, which may lead to a fundamental re-examination of copyright law.

3.1.2. Legal Innovation in AI Copyright: The Progressive Approach

Other jurisdictions, particularly in Asia, have adopted more flexible or forward-looking approaches to the copyrightability of AI-generated works. In these countries, legal frameworks are being adapted to address the inherent difficulties of AI-generated works, driven by significant investments in AI technologies and innovation. More significantly, countries such as China and Japan have enacted provisions acknowledging AI in the creative process and are exploring ways to protect such works. This legislative response reflects a realization of AI's economic and technological benefits and a pragmatic approach to overcoming its challenges.

The Chinese legal framework for copyright protection does not explicitly provide for AI-generated works, thereby leaving the issue up to judicial interpretation. Article 3 of the Chinese Copyright Act outlines two main conditions for copyright protection—originality and intellectual achievement (Oh et al. 2024; *Copyright Law of the People's Republic of China* 2010)—both of which remain the subject of considerable debate for the reasons stated previously. While these criteria are rooted in a traditional, anthropocentric approach, similar to that of the US, rapid advances in AI technologies have forced the Chinese government to adapt. In this regard, China's Next-Generation AI Development Plan, launched in 2017, targets technical standards, policy support, and innovation to make China a world leader in AI by 2030 (Webster et al. 2017). As AI is increasingly used in the creative processes, more prominent shifts in the approach of Chinese courts are shaping the legal landscape with respect to AI-generated content.

Of particular interest are two court rulings in China in 2019, regarding the copyrightability of AI works. One of the first cases to ever consider the copyrightability of AI-generated works, the *Feilin v Baidu* case (Feilin v Baidu n.d.), was decided by the Beijing Internet Court. The ruling held that such content, generated entirely by AI without meaningful human input, was not original and not protected under Chinese copyright law. On the contrary, just a few months later, in *Tencent Shenzhen v Shanghai Yingxin* (Shenzhen Tencent v Shanghai Yingxun 2019), the Shenzhen Nanshan District People's Court upheld copyright protection. The court placed great emphasis on the significant degree of human involvement in the creative process, particularly the deliberate choices and contributions made by Tencent employees, which helped to meet the originality threshold (Wyczik and Wieczerzak 2024, p. 47). Thus, although both cases involved AI-generated works, the key

difference lay in how the courts interpreted originality in relation to the level of human involvement. In particular, the Beijing Internet Court applied an objective standard, requiring a work to demonstrate originality independent of human intention, whereas the Shenzhen Court included human contribution as part of originality. On this basis, these divergent rulings suggest that China may depend on the presence of identifiable human intellectual effort, rather than the mere use of AI in the creative process (Lee 2021, pp. 216–18; Li et al. 2024, pp. 295–97).

More recently, the case of *Li Yunkai v Liu Yuanchun* (*Li v Liu* 2023) clarifies the copyrightability of AI-generated works and its implications under Chinese law. This case, which will be analyzed in detail in a subsequent subsection, represents the first court case worldwide that guarantees copyright protection for an AI-generated image. Between this case and others of its kind, China has made great strides towards incorporating AI-generated works into its copyright framework, demonstrating an increasingly flexible and pragmatic approach compared to stricter jurisdictions such as the US.

Japan's emergence as an AI powerhouse is partly due to its progressive stance on the legal framework governing the use of TDM. Indeed, it was Japan that introduced this exception as early as 2009, long before similar provisions appeared in the UK and the EU (Tyagi 2024). Article 30–4 of the Japanese Copyright Act permits the use of copyrighted materials for non-enjoyment purposes, including "evaluation for development or practical application," "data analysis," and "computer data processing." This framework was reinforced in 2018 by Article 47–5, which extended the permissible uses to include commercial and non-commercial applications. A central feature of Japan's framework is the distinction between uses for enjoyment and for non-enjoyment purposes, with uses for the former being subject to restrictions, and those for "analysis" or "development," including the ingestion of pirated materials, generally being permitted as long as such uses do not infringe the copyright holder's interests (Copyright Act 1970 1970, art. 30(4)).

The provisions of the Japanese Copyright Act are based on two phases of the AI creation process—the learning and development phase and the generation and utilization phase. During the former, copyrighted materials can be ingested and analyzed to train AI systems, a commitment by Japan to promote technological innovation. This stage benefits from the Act's broad TDM exceptions, including using illegally obtained materials under certain conditions. Alternatively, the latter introduces more strict considerations where AI output is created and potentially distributed (Grasser and Warren 2024). Article 2–1 defines a copyrightable work as a "creatively produced expression of thoughts or sentiments that falls within the literary, academic, artistic, or musical domain" (Copyright Act 1970 1970). While the Act does not explicitly address the copyrightability of AI-generated works, the emphasis on "expressions of thoughts or sentiments" suggests that AI is considered a "tool" through which a person can express their creativity. In this context, the user of the AI system would typically be the "author." Whether a person has used AI as a tool depends on two factors—the presence of a "creative intention" and the execution of a "creative contribution." Nevertheless, it appears that there is no standard for the evaluation of these two factors, as they seem to be determined on a case-by-case basis (Japan Copyright Office 2024). This dual-stage framework illustrates Japan's pragmatic balance between incentivizing innovation and allowing some copyright protection, which positions it as an AI-ready jurisdiction.

Several Asian jurisdictions are adapting their copyright regimes to cope with AI technologies. For example, countries such as China and Japan have enacted laws that redefine traditional legal concepts such as originality and authorship to include AI in the creative process. These legislative developments reflect an awareness of the economic and technological benefits of AI, although questions about the human element in AI-generated

works remain central legal issues. Comparable legislative developments have also been identified in Canada, despite its proximity to the US; however, this paper will not attempt to review them in detail. It appears that AI will continue to shape the region's future and that joint efforts between governments, industries, and society will be crucial both to enabling innovation and ensuring the fair and ethical governance of its benefits (Walter 2024).

3.1.3. Between Innovation and Tradition: Striking a Balance

The EU and the UK fall somewhere in between the restrictive approaches of the US and Australia and the more permissive approaches of Asian jurisdictions, such as Japan or China, in the debate on the copyrightability of AI-generated works. These jurisdictions balance technological innovation with the fundamental principles of copyright law, namely originality and human authorship. However, finding this balance has been difficult as AI advancements often outstrip legislative reform. The EU has taken a proactive step by introducing the Copyright Directive (Directive (EU) 2019) and the proposed AI Act (Regulation (EU) 2024), in addition to the Framework Convention on Artificial Intelligence (*Council of Europe Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law* 2024), as part of a new strategy to regulate AI, complemented by Member States and even non-EU countries in Europe, which are preparing their own governance structures to deal with AI-generated content. Despite all these efforts, questions about the copyrightability and regulation of AI-generated works remain unclear.

The Copyright Directive, along with key decisions of the European Court of Justice (CJEU), forms the foundation of EU copyright law, placing originality at its core. As already discussed in Section 2.2, the CJEU has consistently held that originality must derive from human intellectual creativity, thereby excluding works produced entirely by AI systems (Stamatoudi 2017, p. 57). However, AI-assisted works could still qualify for protection, provided they reflect sufficient human creative input, demonstrating the potential for collaboration between humans and AI. Alternatively, the EU AI Act, proposed in 2021 and enacted in 2024, classifies AI systems by risk and imposes transparency, accountability, and safety requirements. These have direct and indirect implications for the legal treatment of AI-generated content, particularly in terms of ensuring responsible use of AI systems and respecting creators' rights. In parallel, non-EU European countries, such as the UK and Switzerland, are developing their respective AI governance frameworks, although it is hoped that these will eventually become compatible with the EU regulatory framework, which would apply to all member states (Gaffar and Albarashdi 2024; Walter 2024).

As stated in the Council of Europe's Framework Convention on Artificial Intelligence, Human Rights, Democracy and the Rule of Law, the region is committed to establishing robust governance structures for AI. As the first binding legal instrument to address AI in its entirety, the Framework Convention aims to ensure that all developments, designs, and uses of AI systems respect human rights, democracy, and law. This initiative builds on the EU AI Act and extends regulatory efforts to non-EU countries (Babická and Giacomin 2024). Together, they are tools for harmonizing AI governance while recognizing national legal contexts. Nonetheless, despite the EU's efforts to address the broader societal implications of AI, the specific implementation of copyright law in relation to AI-generated works demonstrates both opportunities and challenges for adapting conventional legal principles to the specificities of emerging technologies (Zhuk 2023).

The implications of the CDSM Directive's TDM framework, as outlined in Section 2.1, further illustrate the EU's attempt to balance the promotion of innovation with copyright protection; a good example is the "opt-out" mechanism for right-holders, which remains heavily debated (Stamatoudi and Torremans 2021). One such case illustrating the practical application of these exceptions is *Kneschke v LAION* (Robert Kneschke v LAION e.V. 2024),

decided by the District Court of Hamburg in September 2024. It ruled in favor of LAION, a non-profit organization that provides machine learning research datasets, and recognized it as a "research organization" under the CDSM Directive. This designation allowed LAION to use the Article 3 TDM exception to exclude its AI training activities from copyright infringement claims (Quintais 2024, pp. 2–4). Although not fully discussed in this paper, this is one of the first EU rulings to explore the legal limits of TDM in the context of AI development, illustrating how copyright enforcement can sometimes conflict with technological progress.

The UK is one of the forerunners of AI, having provided one of the earliest legal frameworks for computer-generated works under the 1988 Copyright, Designs, and Patents Act. As discussed in Section 2.2, CDPA Section 9(3) attributes authorship to the individual who is responsible for the creation of a work through necessary arrangements, even if they did not directly contribute in its creative aspects. While this approach provides clarity in cases involving AI-generated content, it has been criticized for straying from traditional notions of originality that link creativity to authorship, particularly in frameworks such as those of the EU and the US. It should be noted that UK law does not address scenarios in which a human contributor cannot make the necessary arrangements, such as instances where AI systems develop works on their own or produce works without human intervention (Sandiumenge 2023, pp. 65–66).

Despite these limitations, the UK is one of the few jurisdictions that explicitly protect AI-generated works. This, in turn, has raised the question about whether this approach adequately reflects recent advances in generative AI (Uribe 2023, pp. 60–65). Critics say the UK's approach undermines originality by reducing human ingenuity. In addition, although UK courts have not yet directly addressed the copyrightability of AI-generated works, scholars differ widely on this issue. Originality is assessed at various levels, ranging from an objective standard based on the fulfillment of creative requirements by a human to a more relaxed standard for computer-generated works (Bötticher 2019, pp. 36–37). In parallel to this legal framework, the UK has also been active in more general AI regulation, as exemplified by its 2021 white paper on AI, which calls for a "responsible, trustworthy, and innovative" AI ecosystem (Walter 2024). This dual attention to governance and copyright shows that the UK is trying to balance innovation with traditional legal principles, as further exemplified by the recent open consultation paper on "copyright and artificial intelligence", which introduced four options: (1) leave the existing copyright laws as they are; (2) strengthen the copyright through licensing; (3) introduce a TDM exception that requires little to no permission from the rights holders; (4) introduce a TDM exception that will allow the rights holders to reserve their rights along with supporting measures on transparency (Asif 2025; Intellectual Property Office of the United Kingdom 2024). Nevertheless, how courts and policymakers will handle these inevitable complexities—and whether significant changes will be made to the current copyright framework—remains to be seen.

In light of the ever-changing legal landscape in relation to AI-generated works, the theoretical frameworks and regulatory initiatives discussed so far provide only a partial explanation. The practical application of these laws, as evidenced by court rulings, seems to reveal more about copyright protection in the AI era. Although the EU and the UK are typical middle-ground jurisdictions, others are also developing legal frameworks that balance technological progress with traditional copyright principles. The following section examines seminal case studies that have shaped the global discourse on AI and copyright and explains the differing interpretations and implementations of legal frameworks in response to real-world disputes.

3.2. AI in the Courtroom: How Judges Are Shaping the Future of Copyright

3.2.1. *Li v Liu*: Setting a Precedent or a One-Time Exception?

The *Li v Liu* case (*Li v Liu* 2023), decided by the Beijing Internet Court, is a landmark legal recognition of AI-assisted works under Chinese copyright law. The court determined that the generated image met the requirements of originality and intellectual achievement under Chinese copyright law. Mr. Li's active selection of AI models, input of numerous prompts, setting of parameters, and refinement of the output were found to be sufficiently represented intellectual investment. As a result, the court concluded that the image was not merely a product of automated generation but rather reflected Mr. Li's creative choices and personal judgment, giving Mr. Li full copyright ownership of the work.

The ruling also clarified authorship, confirming the copyrightability of AI-assisted works and rejecting the possibility that the AI model itself was the author, further reinforcing the Chinese legal doctrine that copyright can only be assigned to humans. The developers of Stable Diffusion were also not considered authors, as they did not contribute to Mr. Li's image. The court found that the developers played only a limited role here, contributing as a tool rather than as an independent creative entity. As a result, Ms. Liu was found liable for copyright infringement for using the image without authorization and posting it on social media without removing Mr. Li's watermark. The court imposed several conditions, including a public apology and compensation. This ruling sets a precedent in China that AI-generated content is a protected subject under copyright law as long as a human is sufficiently creative in the production process (Savage and Rosenfeld 2024; Song 2023; Saw and Lim 2025, p. 19).

The decision in *Li v Liu* is clearly at odds with the US precedent, as demonstrated by the *Theatre D'Opera Spatial* case, in which the U.S. Copyright Office denied copyright protection to Jason Allen, despite having contributed to the creation of the image with Midjourney. Despite Allen's attempt to contest this ruling, the Copyright Office stated that the application failed to satisfy the human authorship standard because the core creative elements had been generated by AI. This rigidity highlights one key difference between the US and Chinese approaches; the Beijing Internet Court in *Li v Liu* did not require direct human execution of creative elements, instead recognizing timely engineering, iterative refinement, and selection as human intellectual inputs that contribute to originality (Dai and Keith 2023).

In the *S. Š. v Taubel Legal* case (Wyczik and Wieczerzak 2024, p. 48; S. Š. v Taubel Legal 2023), the Czech court followed the same approach as the US Copyright Office, firmly establishing in Western jurisdictions that human authorship is necessary for copyright protection. The judge dismissed the case on procedural grounds but went on to address AI-generated content and copyright law in general. The image was not protected by Czech copyright law because it was not the result of the creative activity of a natural person, as the court ruled. The ruling stated that the prompts given to the AI may influence the final output but are not creative enough to satisfy the originality standard (Chloupek and Taimr 2024; Pontecorvi et al. 2024). This reasoning echoes that of the US Copyright Office in the *Theatre D'Opera Spatial* case. Both decisions reinforce the notion that all AI systems, no matter how complex, operate autonomously and are not equivalent to human creativity.

The divergent rulings in *Li v Liu*, *Theatre D'Opera Spatial*, and *S. Š. v Taubel Legal* highlight the international debate on the copyrightability of AI-generated works. Although China has shown willingness to protect the copyright of AI-assisted works with human intellectual input, the US and EU have remained more rigid, requiring direct human execution of creative elements. It will be of particular interest to see how China's ruling will affect other countries or whether it is just an isolated incident. This lack of consensus creates a legal maze for creators and AI developers operating across jurisdictions.

3.2.2. Suryast: A Milestone or a Mere Legal Mistake?

The *Suryast* case illustrates the international uncertainty surrounding AI-generated works, as different jurisdictions have responded inconsistently to the copyright issue. A lawyer and artist, Ankit Sahni, applied for copyright registration for Suryast in several countries, with mixed results. In 2020, India granted protection but shortly after withdrew its notice, leaving Suryast still unresolved in its copyright register (King Stubb & Kasiva 2024). Copyright was granted in Canada, with Sahni and RAGHAV AI as co-authors (Canadian Intellectual Property Office 2021). However, the Samuelson-Glushko Canadian Internet Policy and Public Interest Clinic (CIPPIC) is currently challenging this decision on the grounds that Suryast lacks the human skill and judgment required for copyright protection. The application to the Federal Court seeks either to invalidate the registration or remove RAGHAV AI as a co-author, as recognizing AI as an author or co-author would set a problematic legal precedent (*CIPPIC v Sahni* n.d.).

The argument underlying CIPPIC's claim is that the registration process used by CIPO fails to properly assess claims of authorship, thereby potentially recognizing non-human creators. CIPPIC contends that the Canadian Copyright Act and established jurisprudence do not support AI authorship, as this is a historical right reserved for human creators. In addition, CIPPIC argues that allowing AI co-authorship can create significant legal issues, including copyright duration issues, as AI systems are theoretically not subject to death and would, therefore, prevent Suryast from ever entering the public domain. If the Federal Court rules for CIPPIC, Canada is expected to reinforce its position on human authorship and further scrutinize CIPO's procedural practices (Soundmark Law 2024; Samuelson-Glushko Canadian Internet Policy and Public Interest Clinic 2024).

The Supreme Court of Canada has upheld the principle that authorship is a human endeavor in *CCH Canadian Ltd v Law Society of Upper Canada* (*CCH Canadian Ltd v Law Society of Upper Canada* 2004). This decision demonstrates that mechanical processes, such as combining two images to produce a third image using an AI system, do not meet this standard. This precedent supports CIPPIC's contention that Suryast did not sufficiently involve human effort to warrant copyright protection. As the case develops, its outcome will be a proxy for how Canada navigates AI-assisted creativity and the broader international discourse on AI-generated works and copyright law (Macklem 2024, pp. 4–10). While co-authorship may appear to be a concession by Canada at first glance, CIPPIC's challenge highlights a stubborn refusal to deviate from the established human authorship standard. It is evident that the court's decision could influence how Canadian copyright law addresses AI-assisted creativity in the future. In light of the international interest in aligning human authorship standards with emerging technologies, this case could also be shape comparative analyses and policy discussions in jurisdictions facing similar issues.

3.2.3. Thaler v Perlmutter: From Copyright to Patents and Beyond

Thaler v Perlmutter is the case of Stephen Thaler, who attempted to obtain copyright protection for an image produced autonomously by his AI system, DABUS. In 2019, the U.S. Copyright Office ruled that Thaler's application was ineligible due to the human authorship requirement. Thaler challenged the decision, arguing that the AI should be considered the author and that he, as the machine's owner, should own the copyright by extension. However, both the U.S. Copyright Office and the court upheld the rejection, stating that copyright law has historically required human creativity (*Thaler v Perlmutter* 2023). Although the case concerns namely copyright law, it provides insight into broader legal questions relating to AI and IP law in general.

Thaler's legal battle goes beyond copyright and into the realm of patent law through his AI system, DABUS. Although AI has been repeatedly rejected as an inventor by jurisdic-

tions such as the US, the EU, and the UK, South Africa is an anomaly in that it has granted a patent listing DABUS as the sole inventor. This was most likely achieved because loopholes in South African patent law do not expressly define "inventor" as a natural person. However, legal scrutiny shows that this grant might not have been fully in accordance with the statute, as South African patent regulations still require proof of assignment by the inventor to the applicant, a condition that AI, as a non-human being, cannot meet. This difference raises questions about whether South Africa's decision represents a shift in policy or an administrative oversight, given the rejections of similar applications elsewhere (Cochrane and Mhangwane 2023).

Thaler v Perlmutter and the broader legal discussion surrounding DABUS highlight the difficulty of adapting intellectual property law to AI-generated works. Copyright and patent law have different frameworks, but they both ask whether AI is an author or an inventor. At a time when AI is increasingly involved in creative and technological advancements, legal systems across the globe are urged to rethink the boundaries of intellectual property law, a process that may well see some significant revisions to established principles of authorship and innovation.

4. Future Prospects and Conclusions

As shown in previous sections, the global legal framework for AI-generated works is highly fragmented, with different jurisdictions adopting varying approaches. While some countries, such as the United States and members of the European Union, have defended old copyright doctrines that require human authorship, others, such as China, have liberalized these doctrines to allow for AI-assisted creativity. This inconsistency creates substantial legal uncertainty, particularly in light of the increasing penetration of AI-generated content in global markets. A structured approach to AI copyrightability is, therefore, necessary, one that balances innovation with legal certainty, ethical integrity, and the protection of human creativity. A harmonized worldwide framework with adaptable regulatory mechanisms, ethical oversight, and new legal models adapted to AI-generated content could address these gaps and create a fair and sustainable copyright system.

This study suggests that the current international legal framework is inadequate to deal with the complexity of AI-generated works. Human-centric definitions of originality and authorship underpin existing copyright laws but fail to account for machine-generated content produced without direct human intervention. To fill this gap, policymakers must consider sui generis systems for AI-generated works, compulsory licensing mechanisms, or even new authorship standards that allow for human–AI collaboration. Ethical issues, such as transparency of AI training data and accountability for content generation, should also be at the core of any future regulatory frameworks.

Beyond copyright, AI impacts IP law beyond patents and moral rights, raising broader questions about the role of machines in creative and inventive processes. Cases such as *Thaler v Perlmutter* and the DABUS patent litigation illustrate the difficulty of integrating AI into legal systems designed for human ingenuity. The legal boundaries between human work and machine work are becoming increasingly blurred as AI evolves. Ongoing legal reforms should, therefore, not only address immediate copyright issues but also anticipate the long-term effects of AI-driven creativity on global IP frameworks.

Looking ahead, international cooperation is essential for a coherent and forward-looking vision of the copyrightability of AI. Governments, legal institutions, and technology leaders must hold multilateral discussions on common standards, ethical AI development, and regulatory structures that enable innovation while being fair. AI presents opportunities and challenges for IP law, and the decisions made today will have an indefinite impact on creativity, ownership, and artistic expression. Creating an adaptive, inclusive, and ethically

grounded legal framework can help policymakers manage AI-generated works in a way that benefits human creators and the broader digital economy.

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