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Copyright Issues in Artificial Intelligence: A Comprehensive Examination from the Perspectives of Subject and Object

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Abstract: In the era of rapid technological advancement, artificial intelligence (AI) has emerged as a transformative force across various domains. However, this widespread integration of AI technology has given rise to complex intellectual property challenges, particularly in the realm of copyright. This paper explores the intricate landscape of AI copyright issues, addressing disputes related to training data, the copyright status of AI entities, and ownership attribution for creative works generated by AI. From an object perspective, AI-generated creations undeniably meet the requirements of originality and merit copyright protection, irrespective of civil law or common law frameworks. However, from a subject perspective, the legal recognition of independent copyright status for AI is currently lacking in most jurisdictions. Consequently, it is argued that the relationship between AI and its human operator should be legally characterized as a tool-based association, essential for addressing ownership concerns regarding AI-generated works. Furthermore, AI gives rise to novel copyright infringement quandaries, such as data utilization and incorporation of copyrighted works, presenting challenges in definition and enforcement within existing legal frameworks. Thus, there is a pressing need to refine and enhance relevant laws to adequately address these emerging challenges. As AI technology continues to progress, the copyright conundrums associated with it are poised to evolve, necessitating profound and extensive discourse within the realms of law and intellectual property.

Keywords: artificial intelligence, copyright, subject perspective, object perspective, creation of artificial intelligence

1. Introduction

The relentless march of technological advancement has thrust artificial intelligence (AI) into the forefront of catalysts propelling social development across various domains. An exemplary embodiment of this paradigm shift is the recent surge in the prominence of ChatGPT, an AI model devised by OpenAI. This chatbot leverages robust natural language processing capabilities and dialogue generation proficiencies, facilitating the emulation of human-like language comprehension and expression, thus enabling intelligent conversation.

However, this meteoric ascent of AI technology, accompanied by its extensive integration into multifarious sectors, has precipitated a constellation of intricate intellectual property quandaries. These quandaries coalesce into three primary domains: first, the infringement of intellectual property

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rights within the ambit of training data; second, the contentious issue of ascribing copyright status to AI entities; and third, the intricate intricacies of attributing copyright ownership to creative works engendered by AI. For instance, the utilization of publicly available datasets in AI training raises vexing questions regarding potential infringement of third-party patent rights and violations of personal privacy. Simultaneously, the determinations regarding the potential copyright ownership of AI, the eligibility of AI-generated entities for copyright protection, and the appropriate modalities of safeguarding such creations remain profoundly unresolved. Hence, the exigency of attention to intellectual property matters in the realm of AI, especially within the domain of AI-created objects, is both imperative and invaluable.

Presently, the legal frameworks of various nations remain conspicuously bereft of explicit provisions addressing AI-related intellectual property matters. Legal constructions in this arena remain in their exploratory infancy. Notably, among the leading developed economies worldwide, only the United Kingdom has explicitly delineated provisions pertaining to the copyright of AI-generated objects. Under the UK Copyright Act of 1988, the copyright for AI-generated works is vested in "the person who makes the necessary arrangements for the creation of the work." Conversely, the United States, through the Commission on New Technological Uses of Copyrighted Works (CONTU), enunciated in a 1978 report that the authorship of AI works vests in the human user employing AI for creation, not the AI itself. Although not enshrined in formal legislation, the U.S. Copyright Office has upheld this principle for numerous years. Despite recent deliberations reopening discussions on AI-generated copyrights in March 2023, spurred by congressional and public entreaty, the U.S. Copyright Office has yet to formally register any AI-created works. In our own country, prevailing copyright legislation stipulates that copyright protection necessitates a natural or legal person as the subject, and the work itself must manifest originality. Consequently, AI does not meet the criteria for copyright protection, a perspective embraced by many scholars.

The matter of AI copyright has garnered significant attention from scholars both domestically and internationally. Yet, consensus remains elusive, with the principal contentions orbiting the copyright eligibility of AI-generated entities, the modes of safeguarding such creations, and the concomitant issues of ownership. Proponents argue that AI-created entities meet the standards of originality, can be feasibly identified, and that their protection aligns with the legislative intent of copyright law, fostering the expansion of the AI market and the advancement of technology. Conversely, opponents contend that AI inherently fails to meet the prerequisites for copyright eligibility, rendering AI-created entities bereft of originality. Moreover, they posit that extending copyright protection to AI may not effectively incentivize innovation.

Concerning the protection modalities and ownership of AI-generated entities, a chasm of academic opinion prevails. Certain international scholars advocate for a principal-agent model, designating AI developers as principals and AI as their agents. In contrast, others advocate for a consumer goods model. Some scholars, in scrutinizing these various models, advocate for immediate entry into the public domain as the optimal solution. Within our nation, scholars posit the utilization of neighboring rights as a mechanism to resolve the copyright ownership conundrum associated with AI-generated entities, thereby circumventing the pitfalls of overstimulation or inadequate protection and addressing the theoretical challenge posed by AI's lack of eligibility for copyright.

In summary, the issue of AI copyright represents an arena of substantial research significance. Accordingly, this study will scrutinize the copyrightability, subject status, ownership, and infringement facets of AI-generated entities from the dual perspectives of copyright subjects and objects. It endeavors to illuminate viable solutions to these enigmatic problems while offering insights into the future trajectory of AI copyright issues, contextualized within the prevailing trends in AI development.

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2. The Copyrightability of Artificial Intelligence Creations

2.1. Constituent Elements of Works

The "Implementation Regulations of the Copyright Law of the People's Republic of China" provides a succinct definition of works protected by copyright as "original intellectual achievements in the fields of literature, art, and science that can be expressed in certain forms." Consequently, according to this definition, works eligible for copyright protection must encompass three core constituent elements: originality, expressibility, and intellectual achievement. Expressibility necessitates that the work can be conveyed in various forms, encompassing but not limited to text, oral narration, drama, computer software, and others. Intellectual achievement underscores the intrinsic value of copyright protection within the realm of the work itself; in essence, the work represents an intellectual accomplishment within the domains of literature, art, and science, capable of satisfying particular human needs.

Originality is the pivotal requirement, mandating that the work be independently crafted by the author and exhibit some degree of distinction from analogous works in the public domain concerning objective expression. Thus, originality stands as the foundational and driving force of copyright law for the safeguarding of creative works, constituting their fundamental attribute.

From a pragmatic perspective, artificial intelligence creations inherently fulfill the criterion of expressibility. Furthermore, the element of intellectual achievement poses minimal challenges in determining whether artificial intelligence creations can be classified as works. In this regard, artificial intelligence creations do not fundamentally diverge from their human-generated counterparts.

Hence, the crux of the discourse surrounding the recognition of artificial intelligence creations as works primarily revolves around the concept of originality.

2.2. Recognition of Artificial Intelligence Creations as Copyrightable Works

The interpretation of originality within copyright law varies across different legal systems. For instance, in the "author's right system" prevalent in the continental law tradition, emphasis is placed on the notion of the "author," where originality is construed as "intellectual creative activity conducted by the author through the exercise of creativity." This framework underscores that only works genuinely reflecting the author's personality merit classification as the author's works.

Conversely, the "copyright system" within the common law framework exhibits a more lenient stance on originality, stipulating that works need only meet the threshold of "independent creation plus the lowest degree of creativity." As long as a work "exhibits creative sparks," it can be deemed to adhere to the principle of originality. [1] In the context of our nation's copyright law, originality hinges predominantly on two elements: "independence" and "creativity." "Independence" dictates that the work must be independently created by the author, devoid of plagiarism, theft, or similar infractions. Even if a work closely resembles another, as long as it is independently produced by the author, it satisfies the requirement of "independence." "Creativity" necessitates that the creation of works involves a measure of intellectual investment, resulting from the author's intellectual labor. Regardless of the work's inherent value, as long as a certain degree of intellectual effort is evident, it meets the criterion of "creativity."

In the context of artificial intelligence creations, some scholars contend that contemporary AI creations unequivocally meet the minimal requisites stipulated by copyright law for originality. This assertion stems from the increasing difficulty in distinguishing between content created by humans and content generated by AI. In their view, when this distinction becomes imperceptible, the content

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should be objectively acknowledged as fulfilling the minimum creativity requirement stipulated by the constituent elements of originality. [2]

Conversely, other scholars contend that while artificial intelligence creations do adhere to the principle of originality concerning their content, their production process lacks the essential element of creativity. They emphasize that, at this juncture, "the content produced by artificial intelligence is essentially an outcome stemming from the application of predefined algorithms, rules, and templates, far removed from the intellectual creation requisite for the designation of a work." Within this context, we must analyze the issue from the dual facets of "independence" and "creativity." [3]

The dimension of "independence" encompasses both the independence of intent and the independence of creative action. Presently, artificial intelligence heavily relies on human instructions for operation, and its creative actions adhere to human will. Consequently, the "creative intent" inherent in AI creations effectively represents the creative intent of humans, particularly the creators or users of artificial intelligence programs. This affirms the fulfillment of the requirement for independent intent in artworks.

Regarding creative action, AI's creative behavior has historically been the product of predefined algorithms and models established by humans, primarily functioning as a supplementary tool to facilitate human creativity. However, with the advancement of AI technology, especially deep learning, AI has evolved to the point where it can autonomously iterate and establish novel models founded on initial frameworks. At this juncture, AI transcends its role as a mere tool, exhibiting the capacity for independent creation devoid of reliance on human-provided algorithms or programs. Consequently, it satisfies the requirement for independent creative action in the realm of artworks.

Considering the aspect of "creativity," artificial intelligence creations, underpinned by their algorithmic models, unequivocally exhibit a discernible degree of creativity. These creations stand as distinct entities, distinct from mere replicas or duplicates of existing works. Unlike earlier computer-assisted tools, contemporary AI creations traverse beyond the organization and compilation of extant data and materials. They harness expansive databases and employ deep learning techniques to emulate human thought processes, resulting in the autonomous generation of entirely new content. For instance, the text responses generated by conversational AI, exemplified by ChatGPT, draw from extensive databases and algorithmic models, rendering them products of the AI's independent creation. This process entails the analysis of databases, engagement in deep learning, and the ultimate generation of content, signifying a form of intellectual input. Therefore, it satisfactorily adheres to the principle of originality within artworks.

In summation, the current stage of development in artificial intelligence creations readily conforms to the principles of objective originality, both within the continental law and common law systems. By the prevailing standards of copyright law, if an AI creation is generated by a human, it qualifies for copyright protection and may be unequivocally acknowledged as a work in all circumstances. Therefore, disregarding subjective considerations pertaining to the legal status of AI entities and exclusively scrutinizing the objective benchmarks for works, artificial intelligence creations can be fully recognized as works, thereby possessing copyrightability.

3. The Subject Status of Copyright in Artificial Intelligence

3.1. The Issue of Subject Status of Copyright

Following the establishment that artificial intelligence creations can be recognized as works, it becomes imperative to investigate the subject status of copyright in the realm of artificial intelligence. Traditionally, machines have been regarded as auxiliary tools for creation and dissemination under the purview of copyright law, lacking any autonomous legal standing in matters of copyright. However, the advent of artificial intelligence, exemplified by entities like Chat-GPT, has disrupted

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this paradigm. The new generation of artificial intelligence is already capable of active participation in various phases of the creative process, generating copious volumes of high-quality content spanning fields such as art, news, literature, and games. As non-human entities that actively engage in creative endeavors, the role and legal status of artificial intelligence within the domain of copyright present profound challenges to extant copyright legislation.

Regarding the query of whether artificial intelligence can assume the status of a copyright subject, a consensus has yet to emerge within academic circles. Advocates for endowing artificial intelligence with copyright subject status posit that if artificial intelligence can independently create works through its algorithms, it signifies a contribution to the realm of knowledge deserving protection under copyright law. [4] Furthermore, some proponents argue that such recognition does not necessitate fundamental alterations to the existing copyright framework. They contend that granting artificial intelligence copyright subject status can safeguard the interests of artificial intelligence entities and users, thereby fostering the accelerated advancement of artificial intelligence. [5]

Conversely, opponents of granting artificial intelligence copyright subject status emphasize that the current copyright system is inherently rooted in the recognition of natural persons and is explicitly designed to serve their interests. Therefore, apart from natural persons and legal entities comprising natural persons, other entities should not be accorded the subject status under copyright law. They assert that conferring artificial intelligence with copyright subject status would not only engender significant disruptions to the prevailing copyright system but also precipitate a slew of legal and ethical quandaries. This, in turn, would challenge the predominant position of humans within the domain of copyright. [6] In addition, certain scholars adopt a cautious, wait-and-see stance regarding this matter. They contend that, within the present stage of artificial intelligence development, it remains tethered to human control and cannot independently generate works. Given that the algorithms guiding artificial intelligence are formulated by humans, and their creative process hinges on human instruction, artificial intelligence should not possess copyright subject status at its current stage. Nonetheless, with the continual evolution of artificial intelligence technology and its burgeoning capacity to emulate human thought processes, a juncture may be reached where it can genuinely create works autonomously, free from reliance on human directives. At that stage, proponents argue that artificial intelligence should be unequivocally conferred with copyright subject status.

3.2. Illegality of the Copyright Subject Status of Artificial Intelligence

The current assessment unequivocally asserts that artificial intelligence should not currently be endowed with the status of copyright subjects. Firstly, with respect to the Copyright Law in China, the subjects of copyright are explicitly defined as natural persons, legal persons, or other organizations entitled to copyright protection under the law. In accordance with this stipulation, the classification of copyright subjects is restricted to natural persons and legal persons, composed either of natural persons or other entities. Artificial intelligence is conspicuously excluded from this framework. Consequently, absent any alteration to existing legislation, the attribution of copyright subject status to artificial intelligence cannot be legally sanctioned.

Moreover, the bedrock principles and fundamental objectives underpinning copyright law center on the encouragement of creative endeavors. The opening clause of China's Copyright Law explicitly articulates that the primary objective of this legislation is to "protect the copyright of authors of literary, artistic, and scientific works and the rights associated with copyright, to foster the creation and dissemination of works conducive to the advancement of socialist intellectual and material civilization, and to propel the development and enrichment of socialist culture and science." However, this incentive function finds no resonance within the creative operations of artificial intelligence. Artificial intelligence, functioning as algorithmic models trained by human operators, lacks the

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attributes of self-awareness and emotion. Consequently, their creative endeavors remain unaffected by the presence or absence of copyright protection. It is not artificial intelligence itself that necessitates incentivization, but rather the individuals who devise and employ artificial intelligence. Creators of artificial intelligence derive economic benefits through the marketing of AI products, while users obtain the output of these AI systems, thereby constituting an intrinsic incentive mechanism. Bestowing artificial intelligence with additional incentives through copyright protection may inadvertently trigger excessive incentives for an entity capable of prolifically generating numerous works in rapid succession, resulting in an inequitable distribution of rewards and disruption to market dynamics. Hence, in instances where the absence of incentivization does not hinder innovation, as is the case with artificial intelligence, the provision of copyright protection may be deemed unnecessary.

Furthermore, the conferral of copyright subject status upon artificial intelligence engenders an array of legal and ethical quandaries, while simultaneously challenging the preeminent position of human agents in the domain of copyright. The prevailing legal framework is explicitly centered on natural persons as the paramount entities. Granting artificial intelligence the designation of a legal entity would precipitate discord within established societal structures and unsettle the prevailing legal framework that chiefly governs human affairs. Concurrently, this shift initiates profound questions regarding the interplay between natural persons and artificial intelligence. The extant ethical paradigm likewise centers around natural persons as its core constituents. The continual advancement of artificial intelligence invariably prompts the reassessment of the existing unidimensional ethical framework, primarily revolving around human actors. Consequently, deliberation becomes imperative concerning the establishment of a bifurcated ethical framework capable of accommodating the coexistence of natural persons and artificial intelligence.

Drawing upon Hegel's theory of personhood, it is evident that Hegel posits "things" as deriving their determinacy and essence from an individual's will. Only "persons" possess the agency to govern "things" and thereby assert control over their own will and purpose. By extension, a work of art, for instance, while reliant upon materials like canvas and paint, ultimately transcends its materialistic components to embody the spiritual labor and volition of the artist—their creative intent. Accordingly, the essence of the artwork resides in the will of the creative subject, manifested within the artwork itself. [7] This theoretical framework frequently serves as the yardstick for gauging the legitimacy of copyright protection, specifically by affirming that only the spiritual creation of a work merits copyright safeguarding. In essence, only authors who actively partake in the creative process, driven by their own volition, can be deemed the rightful subjects of copyright protection. However, within the current developmental stage, artificial intelligence still adheres to human directives throughout the creative process, devoid of any autonomous volition driving its creative output. Consequently, from the perspective of legal philosophy, it is prudent to withhold the assignment of copyright subject status to artificial intelligence at this juncture.

In summary, considering the prevailing legal framework, the fundamental objectives of copyright law, and the ethical considerations intertwined with human-AI coexistence, it is evident that artificial intelligence should not presently assume the mantle of copyright subjects.

4. Ownership of Copyright for Artificial Intelligence Creations

Having established that AI creations hold copyrightability according to current legal standards and can be classified as works, it becomes imperative to address the intricate matter of copyright ownership pertaining to these AI-generated works. This issue warrants profound contemplation and rigorous research.

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4.1. Current Ownership Distribution Schemes and Evaluations

Considerable in-depth academic research has already delved into the matter of copyright ownership for AI creations. Some scholars have proposed that copyright ownership for AI creations should adhere to the principle of investment, signifying that copyright entitlement for AI-generated works should be vested in the investor. This proposition accentuates that when AI creations fail to meet the criteria for copyright protection due to the absence of constituent elements characterizing a work, it is imperative to first ascertain ownership before designating them as part of the public domain. In the realm of our country's legal framework, copyright for a work can be licensed to individual authors and investors; for instance, the Copyright Law specifies that producers can lay claim to copyright for film works. Embracing a similar investment principle can effectively resolve the practical conundrum of numerous ownerless works and incentivize investors to make greater creative investments, thereby fostering artistic flourishing and optimizing societal gains. This practice not only circumvents the need for excessive modifications to the legal system but also preserves legal stability. [8]

Another school of thought advocates the utilization of the "fruits model" rooted in civil law theory to address the issue of copyright ownership for AI creations. In civil law, "fruits" pertain to portions separated from a specific entity and are deemed the entity's income in societal conventions. In civil law, fruits constitute a relationship between entities, and whether the fruits qualify as a work does not impact their status as an entity. By applying the fruits model to AI creations, one can categorize AI-generated works as a type of fruit and process them in accordance with the prevailing rules pertaining to fruits as delineated in the Contract Law and Property Law. Conceiving AI creations as fruits serves as an effective mechanism for circumventing legal subject qualification dilemmas concerning AI and questions regarding whether AI creations amount to works. This approach provides a resolution to the legal ownership quandaries associated with AI creations. [9]

Furthermore, some scholars have proposed the integration of neighboring rights to resolve the issue of copyright ownership for AI creations. In comparison to author's rights, neighboring rights align more closely with the characteristics of AI creations. They center on safeguarding the investments and labor outcomes of disseminators, a purpose well-suited to AI creations. Furthermore, AI creations encompass subjects and components that resonate with the scope of neighboring rights protection, encompassing data, algorithms, and other elements upon which the creation hinges. Moreover, the subjects and contents of the rights protected by neighboring rights offer greater flexibility, enabling tailored design to suit specific requirements. [10]

Foreign scholars have also contributed unique perspectives to this discourse. Some posit that AI and its users should be construed as constituting a principal-agent relationship, with AI functioning as the agent of the user for creative endeavors. Consequently, in alignment with pertinent copyright law provisions, the copyright of AI creations would be transferred and apportioned to users, programmers, or AI companies. [11] Conversely, there are scholars who advocate for AI-generated creations to immediately enter the public domain without being afforded copyright protection, thereby permitting unrestricted utilization by all. Their rationale centers on the contention that ascribing copyright ownership to AI creations, whether to AI entities themselves or to users and developers, introduces challenges to the prevailing legal structure and may result in excessive incentivization. Thus, they assert that direct entry into the public domain represents the most efficacious solution to address the copyright ownership conundrum associated with AI creations. [12]

4.2. Copyright Ownership Model of Artificial Intelligence Creations Belonging to Users

The existing models for attributing copyright to AI creations can be categorized into three main approaches. The first category bestows legal subject status upon AI, attributing copyright ownership directly to the artificial intelligence itself. However, as previously argued in this paper, granting

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subject status to AI is not a valid proposition, rendering this viewpoint untenable. The second category entails placing AI-generated works into the public domain. While this strategy facilitates enhanced utilization and dissemination of AI creations, promoting societal and cultural prosperity, it must be acknowledged that placing these works in the public domain without copyright protection may engender several drawbacks. These include potentially stifling AI technology development, escalating legal disputes and social controversies, and fostering imbalances in the market interests of creative works. The third category involves assigning copyright ownership for AI creations to a specific group of individuals, encompassing natural persons, legal entities, or other organizations. Despite variations in scholarly viewpoints and supporting evidence, proponents of this approach unanimously contend that copyright for AI creations should be transferred from artificial intelligence itself to a specific group of individuals. This perspective aligns harmoniously with practical requirements.

Firstly, the assignment of exclusive rights to humans directly incentivizes human creativity, thereby effectively promoting continuous AI technology advancement and applications.

Secondly, it is evident that AI still grapples with achieving wholly independent creation, with humans continuing to play a role in the process. Thus, transferring copyright to humans is better suited for this transitional phase.

Lastly, the essence of any legal system resides in granting rights to entities while imposing corresponding obligations and responsibilities. At present, AI lacks the capability to effectively exercise rights, fulfill obligations, or bear responsibilities. By attributing copyright to specific individuals, procedural complexity is mitigated, and rights, obligations, and responsibilities can be more effectively enforced.

Nonetheless, there are multiple methods to transfer copyright ownership of AI creations to humans, including delegation-agent relationships and employment relationships. In this regard, this paper contends that the optimal approach to address the issue of copyright attribution for AI creations is to define the relationship between AI and users as a tool-based relationship, thereby assigning copyright for AI creations to the users. This approach is underpinned by legal philosophy principles and possesses a solid legal and practical foundation.

From a legal philosophy standpoint, Immanuel Kant's proposition that the world comprises two distinct "existents" – irrational existents and rational existents – provides a basis for this perspective. According to this viewpoint, humans employ and transform objects during their interactions with them, treating them as tools. Consequently, the differentiation between "things" and "people" stems from the possession of rationality, with "people" endowed with rationality and "things" lacking it. While AI may exhibit a degree of autonomy, it falls short of the rational attributes associated with "people." Human rationality principally manifests as the capacity to identify, define, and solve problems, with the ability to identify and define problems constituting implicit wisdom and the ability to solve problems constituting explicit wisdom. AI technology has not yet made substantial inroads in replicating the realm of implicit wisdom, which epitomizes distinctly human rational characteristics. Consequently, following this philosophical tenet, "artificial intelligence" remains classified as an "irrational existent" among the two categories of "existents" in the world, possessing only relative value and existing as a tool intended for human use and transformation.

From a legal perspective, artificial intelligence continues to fall within the ambit of objects as defined in civil law. Within the civil law framework, two fundamental categories exist: subjects (persons) and objects (things). Subjects and objects not only correspond to one another, but their legal statuses also remain immutable. Consequently, a subject cannot be transformed into an object, and an object cannot assume the status of a subject; it can only serve as the object of legally recognized rights. Within the current copyright legal system in China, characterizing artificial intelligence as a tool employed in the creative process by humans aligns seamlessly with the logicality and uniformity of

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the prevailing copyright legal framework. This approach allows for the equitable distribution of copyright for AI creations without necessitating substantial alterations to the existing copyright legal framework.

Finally, from a practical standpoint, artificial intelligence is conceived with the goal of assisting humans in realizing their objectives. In reality, AI functions as a means employed by humans to achieve their goals. Presently, AI remains incapable of independently generating creative works and continues to operate under human control. In practical terms, AI serves as a tool throughout the creative process, enhancing human capabilities and facilitating human activities. Consequently, attributing copyright for AI creations to users is consistent with the practical role of AI technology and its current contributions to human endeavors.

In summary, the copyright ownership of artificial intelligence creations should be vested in the users of artificial intelligence. This approach is supported by principles of legal philosophy, the prevailing legal categorization of AI as an object, and the practical reality of AI technology. By assigning copyright to users, it fosters human creativity, propels AI technology development, and establishes a clear legal framework for rights, obligations, and responsibilities.

5. Analysis of Copyright Infringement Issues with AI Creations

In the present phase of intellectual property research related to artificial intelligence, alongside the aforementioned topics concerning AI's copyright status, the copyrightability of AI-generated content, and the ownership of AI-created copyrights, the issue of intellectual property infringement by AI is of paramount importance. This article contends that AI-related copyright infringement primarily encompasses two key facets: infringement related to the sources of AI machine learning data and infringements involving AI-generated content.

5.1. Infringement Issues Relating to Data Sources

Machine learning stands as a foundational technology within AI, relying heavily on extensive datasets for training in order to continuously enhance its algorithms. These datasets often encompass works protected by copyright laws. In the process of AI machine learning, the acquisition and utilization of copyrighted works without the consent of rights holders can potentially breach copyrights, leading to disputes.

Machine learning typically unfolds across three stages: input, learning, and output. During the input phase, where substantial training data is amassed, AI companies may not consistently adhere to copyright regulations, resulting in potential infringements. Currently, AI companies employ three primary methods for copyrighted works: [13].

5.1.1. Web Crawling Technology

This method involves extracting data from websites. Despite the existence of a "crawler protocol" that outlines permissible content for web crawling, AI companies, driven by the need to amass training data swiftly and efficiently, often deviate from these protocols. As the majority of website content is copyrighted, unauthorized data extraction for commercial purposes can give rise to copyright infringement.

5.1.2. Digitization of Non-Digital Data

AI companies may acquire non-digital publications and then digitize their content, or they may obtain illegal digitized versions. Regardless of the specific approach, both instances can be construed as copyright infringement.

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5.1.3. Forced Data Collection Through User Agreements

Certain AI development companies, typically large internet enterprises with extensive product portfolios and substantial user bases, may include copyright permission clauses within their internet product service agreements. While data acquisition through such agreements is legally compliant, the imposition of such clauses contradicts the spirit of copyright laws, potentially compromising the copyright interests of user-generated content.

To address the existing infringement concerns related to AI's data sources, stringent measures must be implemented to mitigate legal risks. Firstly, AI companies should establish rigorous data usage standards and guidelines that unequivocally delineate the copyright regulations they are bound to adhere to. Additionally, transparency in service agreements is paramount. AI development companies must explicitly detail data usage within these agreements, ensuring that users possess comprehensive comprehension of and consent to the terms therein.

5.2. Infringement Issues of AI Creations

AI creations, founded upon input data and meticulously processed through extensively trained algorithmic models, inevitably incorporate copyrighted works to varying degrees. Such usage typically does not fall within the purview of "fair use." In our country, copyright law delineates twelve specific scenarios that qualify as fair use, none of which encompass the current utilization of AI. While the utilization of copyrighted works by AI creations may not be characterized as fair use, these actions also grapple with the challenge of being definitively categorized as infringements under current legal frameworks.

The principle of "contact + substantial similarity" is conventionally applied to ascertain copyright infringement. Nevertheless, the determination of "substantial similarity" remains intricate due to its inherent abstraction and subjectivity. [14] Unlike conventional copyright infringement cases, AI creations lack a singular, unequivocal infringing entity. Their creative process relies on existing works for data analysis and research, culminating in the generation of distinctive expressions. Consequently, the object of infringement lacks specificity and can be multifaceted. To navigate this quandary, it is imperative to refine the criteria used to gauge the "substantial similarity" of artificial intelligence creations.

This necessitates a departure from the prevalent approach of abstract filtering supplemented by holistic observation. Instead, it involves incorporating criteria for evaluating market encroachment into the analysis. By comprehensively assessing the extent of AI creations' usage, the recommended approach primarily emphasizes holistic observation, complemented by the abstract filtering method. This strategy is designed to address the challenge of determining instances of infringement stemming from the nebulous quantity and scope of infringing entities. [15]

6. Conclusion

In summary, artificial intelligence (AI) has become a ubiquitous presence in various fields, raising significant copyright-related questions that warrant diligent examination. To comprehensively explore the copyright issues confronted by AI, it is essential to adopt a dual perspective that encompasses both the object and the subject of copyright.

From the object-oriented standpoint, adhering to the provisions of copyright law pertaining to the criteria for originality, creations generated by artificial intelligence exhibit the requisite originality under both civil law and common law systems. Consequently, these AI creations qualify for copyright protection, affirming their eligibility for safeguarding under copyright law.

However, when considering the subject aspect, it becomes evident that the legal frameworks of the majority of countries worldwide have yet to confer copyright subject status upon artificial

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intelligence. To prevent excessive incentives and in light of philosophical considerations, it is recommended that artificial intelligence not be granted copyright subject status. In this context, where copyright protection is imperative for AI creations but AI lacks the status of a copyright subject, we can aptly resolve the issue of copyright ownership by defining the relationship between artificial intelligence and users as that of a tool.

Moreover, copyright infringement concerning artificial intelligence presents a notable concern in the realm of copyright law. This primarily encompasses infringements associated with source data during the machine learning process and the unauthorized utilization of works by AI creations. Many of these infringements are challenging to conclusively establish within current legal practice, yet they undeniably encroach upon the legitimate rights of other copyright holders. Thus, addressing infringement issues related to artificial intelligence demands judicious legal refinement and regulation.

However, it's important to underscore that the aforementioned research is predicated on the current stage of artificial intelligence development. As AI technology continues its rapid advancement, the emergence of strong artificial intelligence remains a possibility in the near future. In such an altered landscape, copyright issues pertaining to artificial intelligence would inevitably undergo further transformations, necessitating researchers to engage in more profound and contemplative exploration.

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