

Exploring the Path of Copyright Protection for Artificial Intelligence Products

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Abstract. Riding on the "east wind" of ChatGPT's explosion, the copyright issues involved in artificial intelligence products have once again become the focus of academic circles. At present, the number of artificial intelligence products is proliferating, and the lack of protection of artificial intelligence products under the copyright law has led to multiple risks such as untrue attribution of artificial intelligence products and irregular regulation of plagiarism of artificial intelligence products. The practical demand for copyright protection of artificial intelligence products needs urgent response from the legal level. As the logical starting point for granting copyright protection to artificial intelligence products, there are two kinds of differences in the determination of the originality of the products, namely the personality binding theory and the objective standard theory. From the perspectives of legislative spirit, copyright development trend and technical feasibility, it is justified, feasible and positively meaningful to adopt the latter to grant copyrightability to artificial intelligence products. Based on the evaluation of the value of the copyrightability of artificial intelligence products, the originality criterion is broken down into two major elements, namely, uniqueness and creativity, to build a factual judgment path for the copyrightability of artificial intelligence products, and then to realize the specific determination of the copyrightability of specific artificial intelligence products. This in turn gives rise to the dispute over the copyright ownership of artificial intelligence products. At this stage, allowing copyright rights and interests to be freely distributed among relevant subjects is an appropriate way to create the best benefits and maintain a balance of interests of all parties.

Keywords: Artificial Intelligence Products; Copyright; Copyrightability; Ownership of Rights.

1. Presentation of the Problem

1.1 The Number of Artificial Intelligence Products is Blowing up

Open AI launched ChatGPT at the end of 2022, and GPT-4 with optimized language model released in March 2023 has become a global phenomenon application. Based on large-scale pre-trained models, ChatGPT has the ability of language understanding and text generation, not only for chatting and interacting like humans, but also for tasks such as writing papers, emails, and code. By introducing Reinforcement Learning with Human Feedback (RLHF) and optimizing the ability to analyze context during conversations, [1] ChatGPT generates content that is more in line with human perceptions and needs, presenting a stronger anthropomorphism than previous language models. It is no coincidence that Baidu followed by releasing Wenxin, a generative dialogue product based on Wenxin's large model technology, and Google launched chatbot bard based on Conversational Application Language Model (LaMDA) Major technology giants such as FaceBook, DeepMind, Amazon, and Nvidia have also been respectively NLP, CV or multimodal aspects to accumulate technical reserves that can be applied to areas such as language generation. This will inevitably lead to a proliferation of artificial intelligence products in the future. On the other hand, with the improvement of AI's deep learning capability and the expansion of the corpus in specialized fields in various countries, artificial intelligence products are as good as or even better than human works in terms of socially acceptable evaluation standards and meeting the spiritual needs of audiences, not to mention its content generation rate is much higher than that of humans. The prediction made by Narrative Science, a leader in algorithmic journalism, in 2015 that "within the next 15 years, 90% of all news and a large number of art and music works will be produced by artificial intelligence" seems to be coming true.[2]

1.2 Challenges to Copyright Rules by Artificial Intelligence Products

The value of the work itself, i.e., the value created for a particular audience rather than the value of the labor it embodies, was once one of the leading views in the field, [3] and has been summarized by scholars as a results-based perspective that has taken on a new life when analyzing the risk of the proliferation of artificial intelligence products impacting copyright rules. [4]

Even the content generated by the mechanical completion of instructions as a human tool has the possibility of being recognized as "thought", not to mention the rapid development of artificial intelligence has been able to express "human-like thought" in the generated objects through the logic of abstraction, copying and definition. [5] artificial intelligence products are infinitely similar in appearance to human works and can be identified by unconventional means. For example, in 2016, an AI-generated novel passed the preliminary rounds of a Japanese fiction competition, "Wordsmith" has been used by the Associated Press to write news, and "Rembrandt" has created "The Next Rembrandt," which bears a striking resemblance to the painter's style. [6] is an example of the potential of AI-generated works artificial intelligence products to meet audience needs and commercial applications. The current Copyright Law of the People's Republic of China (hereinafter referred to as the Copyright Law) does not yet include artificial intelligence products in its regulation, which directly leads to the following two major risks.

One of them is the risk that the artificial intelligence products is not authentically signed. One of the cases is that the AI owner claims that the artificial intelligence products belong to the AI owner based on the principle of the fruits of the property owner's property. The second scenario is that the signatory uses the AI to write on his behalf. These two scenarios will first impact the social evaluation mechanism based on the authenticity of the work. In the current situation where the AI professional corpus is not sufficiently learned, the undersigned will put the AI-generated content into the public domain in bulk, which will also increase the risk of the AI generating false and biased information and thus endangering public safety. Second, the risk that the law cannot make a negative evaluation of plagiarized artificial intelligence products. Even if the perpetrators actually contact and refer to artificial intelligence products in their creation and meet the "substantial similarity standard", it is difficult for the current copyright law to make negative evaluation of such acts. For example, many domestic and foreign journals have stated that they restrict the use of AI in writing, which reflects both the public's concern about the integrity of creative works in the age of AI and the spontaneous counteraction against plagiarism of artificial intelligence products in the absence of institutional protection.

According to the prevailing view in the field of information science, artificial intelligence is divided into: narrow AI (weak artificial intelligence) and general AI (strong artificial intelligence). In the former category, no matter how advanced its algorithms are, they can only achieve one of the purposes for which they were designed. Unless retrained, its learned data, models cannot be migrated to algorithms designed to achieve other purposes. General AI, on the other hand, can accomplish knowledge migration across different domains, exhibit human-like or superhuman intelligence in all domains, and can handle a wide range of cognitive tasks as humans do in a given time frame. [7] The emergence of ChatGPT, on the other hand, indicates a transitional phase between narrow AI and general AI, where ChatGPT can already serve different purpose-defined tasks and find optimal solutions to tasks based on reinforcement learning with human feedback. The arrival of general AI will be a fundamental challenge to the current institutional system and human free will, [8] and there has been controversy in the academic community as to whether general AI can be realized in the foreseeable future, but the arrival of "transitional AI" is an indisputable fact. The promulgation of the State Council's "New Generation Artificial Intelligence Development Plan", "Internet" + Artificial Intelligence Three-Year Action Implementation Plan", and "Smart Manufacturing 2025" have also shown that AI is bound to have a deeper impact on society's production and lifestyle, and that there is an urgent need for a legal response to the relevant practical appeals.

Corresponding to the stages of AI development, artificial intelligence products are also divided into three stages: objects generated as human tools, objects generated in "cooperation" between

humans and AI, and objects generated by AI on its own. The first category of artificial intelligence products is ultimately created by humans and can be protected under existing laws. The second and third categories of artificial intelligence products are those generated by AI when human intervention does not dominate or even does not intervene. So far, artificial intelligence does not have independent consciousness, and what it performs is only the will of the designer or operator, which cannot yet generate objects completely independently. artificial intelligence products are based on the results of human pre-defined procedures, algorithms, rules and models. Therefore, this paper will study the object generated by the "cooperation" of human and AI.

2. Copyrightability Analysis of Artificial Intelligence Products

The current discussion on the legal attributes of artificial intelligence products focuses on whether artificial intelligence products are copyrightable, and the main views are: negative, non-copyright protection model, and copyright protection model. The controversy is really a disagreement on the definition of "originality". The author proves that the standard of "originality" should be associated with the value of the work itself, and that the artificial intelligence products are copyrightable from the perspective of conforming to the spirit of legislation, conforming to the development trend of copyright, and having technical feasibility.

2.1 Copyrightability Controversy of Artificial Intelligence Products

2.1.1 Negation

The view is that artificial intelligence products are not copyrightable. The core reason is that AI does not meet the requirements of copyright law for authorship, and that copyrightability of artificial intelligence products is inconsistent with the legislative spirit of copyright law to stimulate human creativity, and will result in the scarcity of copyright being lost. This proposition adopts the subject-object consistent evaluation standard and analogizes AI to Naruto, [9]the black-crowned macaque that was judged to be unable to obtain the copyright of a photograph. According to the international consensus set by the Berne Convention and the jurisprudential basis of our existing legislation, the author is the original copyright owner of the work, AI does not have authorship, and the standard of originality is closely linked to the author's personality. Based on this, some scholars advocate to put the artificial intelligence products into the public domain with the theory of public property. [10]Some scholars also advocate the protection of artificial intelligence products by property rights mechanism.

2.1.2 Non-copyright Protection Model Says

The non-copyright protection model also denies the copyrightability of artificial intelligence products, but since it also proposes a new protection model, it is listed separately. Some scholars propose that AI is not out of the category of things, and artificial intelligence products belong to the relationship of "material creatures", so the theory of fruits can be adopted to protect artificial intelligence products. [11]Some scholars argue that artificial intelligence products are data information products or data property, and AI users can claim claims against others for tampering and plagiarism.[12] Some scholars also advocate the protection of neighboring rights for artificial intelligence products, so as to protect the "non-creative input" of AI investors.[13]

2.1.3 Copyright Protection Model Says

Although these views share the conclusion that copyright protects artificial intelligence products, they are based on very different evaluation standards and reasoning paths. One view is to adopt the subject-object consistent evaluation standard. Once the issue of subject qualification of AI is solved, the problem of identifying the attributes of artificial intelligence products will be solved easily. For example, some scholars advocate giving AI legal personality by referring to the legal person system. [14]The second view is to adopt the standard of separating the subject and object, not to deny the copyrightability of the artificial intelligence products because the subject of creation is not a natural person, but to separate the qualification of the AI author from the qualification of the object of the

work generated. For example, the principle of "sweating on the forehead" [15] or the satisfaction of audience interests [16] are used to establish objective criteria for judging originality.

2.2 Proof of Copyrightability of Artificial Intelligence Products

It is not necessary to elaborate on the value of artificial intelligence products, but if it is regarded as public property, it not only prevents the relevant subjects from obtaining reciprocal benefits for their individual labor, but also encourages plagiarism in disguise, which ultimately depletes the motivation of relevant subjects to invest resources in intellectual creation and improvement of artificial intelligence technology, [17] leading to The "tragedy of the commons". [18] Therefore, artificial intelligence products should be protected, and it is more reasonable to protect it by copyright. Going back to the history of copyright law, the origin of modern copyright law, the Anna Act, originated from the need to balance the competitive interests of publishers and public interests. Nowadays, artificial intelligence is developing rapidly, and we should not limit ourselves to hermeneutics or legal doctrine, and examine with an open mind whether the protection of artificial intelligence products by copyright is conducive to the protection and balance of related interests.

From the viewpoint of the legislative spirit, the copyrightability of artificial intelligence products is in line with the legislative intent of the Copyright Law. On the one hand, the copyrightability of the artificial intelligence products stimulates the application of artificial intelligence products by users, expands the market of AI systems and enhances the enthusiasm of AI technology research and development; on the other hand, it means that the arbitrary use of artificial intelligence products to "take advantage" of the copyright infringement, prompting the public to pay attention to innovation in the process of using artificial intelligence products and improve the quality of creation. On the other hand, it means that the free use of AI-generated works is an infringement, and the public should pay attention to innovation in the process of using AI-generated works, to explore the unique advantages of human creativity and to improve the quality of creativity. The ultimate goal of both is to promote cultural prosperity and meet the diverse spiritual needs of audiences. As long as it can stimulate creativity and create social value, the protection of artificial intelligence products is ultimately a service to human interests and a reflection of human-centeredness. [19]

Judging from the development trend of copyright, weakening the link between the standard of originality and the personality of a natural person has been a common trend in the copyright law of civil law systems and common law systems. Even French copyright law, which emphasizes most on the link between the personality of the work and the author, has abandoned the traditional "reflection of personality" standard for determining originality in response to the challenges posed by artificial intelligence, and has instead moved towards the pragmatic "intellectual creation" objective standard adopted by the Supreme Court of the European Union. In response to the challenges posed by AI, the traditional "reflection of personality" standard of originality has been abandoned, and the pragmatic "intellectual creation" standard adopted by the Supreme Court of the European Union has been moved closer. [20] The higher the degree of automation of artificial intelligence in the process of creation, the greater the need to weaken the originality and the personality of a natural person, so China can take the advantages of both copyright and copyright and interpret the originality standard from a new perspective. [21]

In terms of technical feasibility, the Copyright Law does not explicitly stipulate that a work can only be created and completed by a natural person. Although Article 11(2) of the Copyright Law provides that although the Copyright Law stipulates that the natural person who creates a work is the author, [22] the provision aims to determine the copyright ownership rather than the source of determining originality. [23] This undoubtedly leaves room for objective criteria for the originality of AI creations.

Whether artificial intelligence products have the qualification of legal subject directly affects the right attribution of artificial intelligence generation, and this denies the copyrightability of artificial intelligence products completely lacks complete logic. As a matter of fact, the debate on the copyrightability of artificial intelligence products is only the surface of the controversy, whether to

adopt the principle of consistent or separate evaluation of copyright subjects and objects, but the essence of the controversy is the definition of the standard of "originality". The negative view emphasizes that "originality" is bound to the personality of a natural person, while the affirmative view ties the criterion of "originality" to the value creation of the work itself. The latter is more reasonable in the age of artificial intelligence, as evidenced above.

3. Specific Determination of the Properties of Artificial Intelligence Products

The proof of copyrightability of artificial intelligence products addresses the value judgment of whether artificial intelligence products may become works. On this basis, what objective elements need to be satisfied for artificial intelligence products to constitute works is a matter of fact. The elements of works stipulated in the existing copyright law are sufficient to determine whether the artificial intelligence products have the properties of works. [24] It is indisputable that the artificial intelligence products belong to the achievements in the fields of literature, art and science that can be expressed in certain forms, so the focus of the discussion lies in the definition of the standard of originality. Whether from the perspective of the interpretation of the Chinese and English languages or from the perspective of the general theory of the academic community, originality is usually divided into two elements: "uniqueness" and "creativity".

3.1 Determination of the Uniqueness of Artificial Intelligence Products

First, the generation of incremental knowledge is a necessary condition for the uniqueness of a work. [25] Incremental knowledge refers to the rearrangement of symbolic combinations in existing works. Take ChatGPT, which currently marks a breakthrough in general artificial intelligence technology, as an example. the underlying logic of ChatGPT is similar to solitaire, in which two words are first generated, and based on the preliminary massive corpus learning, the frequency of word usage is understood, and the most probable word is recommended for infinite solitaire. In this process, humans guide the direction of solitaire with a specific reward model, and the model tends to choose a certain choice as the most probable answer, so as to simulate human thinking and solve human problems. However, once such solitaire is scaled, ChatGPT's intelligence will break through and achieve a continuous "emergence" of capabilities beyond the arrangement and reorganization of existing knowledge. At the same time, ChatGPT is able to remember previous guidance in the same "solitaire", so each generated content is a personalized product of the user's interaction with the language model, resulting in incremental knowledge. [26]

Second, uniqueness requires that the work is independently created and completed, rather than the result of plagiarism and copying of others' works. At present, artificial intelligence products still belongs to the product of algorithm and human interaction. [27] The deep learning of artificial intelligence requires the "feeding" of huge amount of data and works. In this process involved in the copying and web crawler mining behavior suspected of infringement, the law has not yet made a final decision. However, what is clear is that only artificial intelligence products that reasonably use other people's works within the scope of authorization, based on compliance with relevant regulations and the developer's terms of use, and respect for the rights of other copyright holders, may meet the standard of uniqueness.

3.2 Creative Recognition of Artificial Intelligence Products

Following the principle of copyrightability of artificial intelligence products, the creative determination of artificial intelligence products should adopt the standard of separation of subject and object. In other words, when determining the creativity of artificial intelligence products, it is not necessary to prove the qualification of the subject matter of AI and the true will of AI, which are not yet determined by science and law, but should focus on evaluating the value of the artifacts themselves. This standard is also in line with the development trend of copyright law since the 20th century, [28] when personalism has declined and utilitarianism has risen, which essentially requires

the transformation of creativity determination from author-centeredness to work-centeredness. Based on the objective criterion of creativity, the key to determining the creativity of artificial intelligence products is whether it can provide the same functional value to the public as a human work, i.e., to continue the existing criterion of creativity, and to observe whether it meets the minimum creativity requirement and is sufficiently confusing with a human work in terms of appearance. [29]At the same time, the central role of the audience in the determination of creativity should be emphasized. The functional value of a work is only reconstructed through the interpretation of the audience in the interactive structure of "author-text-audience". In other words, the establishment of objective creativity criteria will inevitably bring about a change of perspective, and the judgment of the audience's perspective will better meet the pluralistic spiritual needs of the audience, which in turn will feed the innovative development of the knowledge field.[30]

4. Discussion on the Ownership of Copyright of Artificial Intelligence Products

Based on the value evaluation of the copyrightability of artificial intelligence products, the originality standard is dismantled into two major elements of uniqueness and creativity, and the factual judgment path of copyrightability of artificial intelligence products is constructed, which in turn realizes the specific determination of copyrightability of specific artificial intelligence products. Once the artificial intelligence products can be given copyright protection, the issue of copyright ownership of artificial intelligence products will arise. The dispute over ownership revolves around two issues, namely whether AI itself, AI-related subjects (including AI developers, AI investors and AI users) can obtain copyright, and how to allocate copyright when multiple subjects are entitled to obtain it. Firstly, the AI is excluded from the copyright owner through the falsification of AI as the subject of rights. Secondly, based on the high flexibility of copyright property rights, the copyright property rights should be allowed to be freely allocated and transferred among AI-related subjects.

4.1 The Falsification of Artificial Intelligence as a Subject of Rights

So far, all human legal systems have been constructed under anthropocentrism. [31]Artificial intelligence, as a non-human object, should not be a legal subject. If AI is to be granted the status of a legal subject, the risks involved should be carefully evaluated, rather than blindly evaluating uncertain events legally. At present, artificial intelligence has not yet exceeded the scope of "artificial", and its intelligent core is not sufficient to realize self-cognition and autonomous application, not to mention performing civil obligations, exercising civil rights and assuming civil liabilities in a manner approved by human beings. Rashly giving artificial intelligence and human beings the same legal status will have a huge impact on the existing order values and institutional norms of society. [32]Second, artificial intelligence does not yet have self-awareness and emotional capacity, and cannot be stimulated by the granting of rights to promote creativity. At this point, empowerment is of little significance to either humans or AI. Finally, from the pragmatic point of view, since the discussion on whether AI should become the subject of rights is to solve the problem of copyright ownership of artificial intelligence products, if the existing institutional framework is sufficient to solve the problem, there is no need to create new civil subjects at a high cost.[33]

It is noteworthy that some voices in academic circles advocate granting AI subjectivity with reference to the legal person system. [34]However, such a view ignores the existence of common human will as a prerequisite for the legalization of legal persons as subjects of law. By legalizing the common will of the human group behind the legal person, the legal person is able to form the capacity of meaning and behavior, and the implementation of specific acts of the legal person still relies on natural persons. Therefore, the proposed legal person as a legal subject does not violate the legal subject qualification element. And artificial intelligence involves all kinds of human subjects, including artificial intelligence investors, designers and use obviously cannot form a common will. [35]Therefore, the direct reference to the legal person system to give artificial intelligence subject qualification lacks reasonableness.

4.2 Allocation of Copyright of Artificial Intelligence Products under the Narrow Copyright Model

There are two main views in the academic circles on the attribution of copyright to artificial intelligence products: First, AI as the copyright owner, and the copyright will be assigned to AI. [36]Second, and the mainstream view in the academic circle, the copyright is assigned to the natural or legal person related to AI, but the specific subject to which it should be attributed is quite controversial.

Some scholars argue that it should be attributed to the AI developer. The reason is that the minimum creativity of artificial intelligence products comes from the value input of AI developers in the process of model training. The process of generating content by AI is essentially a creative act representing the will of AI developers. Therefore, according to the rule of substantial contribution, copyright should be granted to the AI developer. However, the foundation of this view has gradually shaken with the continuous development of AI technology. [37]For example, each generated content of ChatGPT is a personalized product of the user's interaction with the language model rather than a fixed result of the execution of a given algorithm. In other words, the design of the AI developer indirectly guides the generation process, but not enough to directly control and ultimately determine the outcome.

The reason for advocating attribution to AI investors is that AI technology research and development depends on strong capital investment, and protecting the interests of investors is in line with the incentive theory of copyright law. The copyright ownership arrangement of functional works should be taken as the copyright owner, so as to promote the investors to invest more in the R&D of AI technology and thus promote the technological progress. [38]This view can be responded to by the example of ChatGPT, which was developed by a U.S. company, yet the U.S. is currently recognized as the country with the clearest attitude of not protecting artificial intelligence products by copyright law. Neither the U.S. Copyright Office nor the U.S. federal courts have categorically denied that artificial intelligence products constitute works, and it is not necessary to address whether the copyright of artificial intelligence products belongs to the investor. This is sufficient to show that whether an investor obtains the copyright of artificial intelligence products does not necessarily affect its investment behavior. The AI investor mainly earns profits by collecting service fees or software license fees to recover costs, and if the AI investor is allowed to charge fees based on the copyright of artificial intelligence products, it will also raise the problem of impropriety of double profits.

Other scholars argue that it should be attributed to AI users, on the grounds that AI has not yet left the category of aids to human creation in the transition stage from narrow AI to general AI. The content generated by AI is closely related to the user's guided instruction behavior. [39]Based on the tool property of AI, the copyright of artificial intelligence products should be attributed to the users of AI. However, such ownership configuration also has the suspicion of omitting to evaluate the labor input of AI developers and investors.

Therefore, there are limitations to assigning the copyright of artificial intelligence products to any of the above categories of subjects. In view of the high flexibility of copyright property interests, it is possible to allow the free transfer and circulation of copyright property interests among various subjects. Each type of subjects can allocate property interests according to the proportion of their contribution to the specific artificial intelligence products, which is applied in practice by agreeing on the allocation of property interests through the principle of meaningful autonomy. In this way, it can avoid the risk that the law designates any kind of subject as the copyright owner of artificial intelligence products, which may damage the enthusiasm of other subjects to invest their capital or labor, and is conducive to creating the best benefit. Take ChatGPT as an example, currently OpenAI has promised to transfer the rights and benefits related to ChatGPT-generated contents to users in the user terms and conditions, and investors have substantially given up the copyright of ChatGPT-generated contents at this stage. In the future, investors may realize the copyright property rights and interests by charging service fees or usage fees, and the transformation of ChatGPT from the open use state to the closed use state is a reflection of the process of realizing the free distribution of

copyright property rights and interests by the relevant subjects through the principle of meaningful autonomy. [40]The allocation of the personal rights and interests of copyright in artificial intelligence products shall follow the same principle and will not be elaborated here. However, according to the necessity of acquiring rights, the users of AI may eventually become the only subject to obtain the personal rights and interests of artificial intelligence products.

5. Conclusion

The launch of ChatGPT marks that the research and development of general AI technology has entered the fast lane. When human society may be swept into an unprecedented change by the AI technology in the eye of the storm, we need not only to embrace the unknown with a more open attitude, but also to examine how to respond to the problems in the change with a calm gaze. The logical starting point for exploring the path of copyright protection for artificial intelligence products is that artificial intelligence products are copyrightable. The relevant controversy focuses on whether the originality standard should adopt the personality-binding or objective standard. Both standards are reasonable within the scope of their respective perspectives, and it is only by solving the antecedent issue of standard selection that there is a possibility of unifying the divergent ground. From the perspectives of legislative spirit, copyright development trend and technical feasibility, it is justifiable, feasible and positive to adopt the latter to give copyrightability to artificial intelligence products. On the basis of the evaluation of the value of copyrightability of artificial intelligence products, the originality criterion is broken down into two elements of uniqueness and creativity, so as to clarify the factual elements of copyrightability of artificial intelligence products. This in turn gives rise to the issue of copyright ownership of artificial intelligence products. At this stage, it is appropriate to allow copyright rights and interests to be freely distributed among relevant subjects or to create the best benefit and maintain the balance of interests of all parties. Of course, the article's analysis of the copyright protection path of artificial intelligence products is limited to the stage of weak AI. With the rapid development of AI technology, when the continuation of the existing system is insufficient to cope with the problem, the exploration of introducing new system and new subjects is inevitable.

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- [40] See Li Hang, "The Identification and Attribution of Rights of Artificial Intelligence Generated Content from the Perspective of Copyright," in *Entertainment Law Insider*, No. 4, 2023.