

Research on Copyright Issues of Artificial Intelligence Generated Products

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Abstract: With the rapid development of artificial intelligence (AI) technology, issues related to the copyright of artificial intelligence generated products are intriguing. On the issue of whether artificial intelligence generated products constitutes a work in the sense of copyright law, originality and intellectual achievement attributes are the key elements. Meanwhile the standard of originality should be moderate. In terms of subject qualification, it is possible to artificially attribute authorship to AI, but it shouldn't be given the status of a subject of rights. Regarding the attribution of rights to artificial intelligence generated products, the proposed system of copyright attribution should be based on whether the user has made the necessary participation, including different attribution scenarios for the user, the investor and the public domain. All in all, copyright law needs to adapt to technological changes while striking a balance between respecting the objectives of the law and safeguarding the interests of rights holders.

Keywords: artificial intelligence products, copyrightability, right allocation

1. Introduction

With the rapid development of artificial intelligence technology, we are witnessing an unprecedented creative revolution. Huge breakthroughs have been made in generative AI, where AI is not only able to perform complex data analysis, but also use advanced algorithms to create literary and artistic works such as novels, poems, music, paintings, etc. On 15 February 2024 US-based AI research company Open AI released Sora, a large model of AI text-generated video, which generates compliant videos based on the inputted text and this will have an impact on the traditional film and television industry. The copyrightability and copyright attribution of these artificial intelligence generated products have triggered extensive discussions, and have also posed new challenges to the traditional copyright legal system. Under the existing legal framework, copyright protects the fruits of human intellectual labour, but this definition becomes blurred when AI is involved in creation. Does an artificial intelligence products constitute a work? If so, how should the attribution of copyright be defined? These questions concern not only the protection of creators' rights, but also the public interest and the preservation of cultural diversity.

This paper will explore the copyright issues of artificial intelligence generated products by analysing their characteristics and existing copyright laws. The paper will conduct a systematic research on the copyright issue of artificial intelligence generated products from the perspectives of the copyrightability of artificial intelligence generated products, the issue of the eligibility of the creative subject of AI, and the attribution of copyright. The goal of this paper is to promote reasonable

regulation and effective management of AI creative activities, to ensure that the rights and interests of human creators can be protected while respecting innovation, and to promote the healthy development of culture and art.

2. Copyrightability of Artificial Intelligence Generators

2.1. The Copyrightability Controversy of Artificial Intelligence Generated Products

On the issue of copyrightability of artificial intelligence generated products, there are affirmative and negative arguments. According to the affirmative view, artificial intelligence generated products can constitute works in the sense of copyright law, and the process of creating works by AI is better than the simple copying and splicing of existing knowledge and information, and its innovative ability is unprecedented, and artificial intelligence generated products are no different from human-created works in terms of external form.[1] Artificial intelligence generated products have an objective value close to that of traditional works, and their protection through copyright law is not only a practical necessity, but also logically justified. [2]On the other hand, the negative argument holds that artificial intelligence generated products are the result of the application of algorithms, rules and templates, which are highly homogeneous with the existing works, and that one of the purposes of the copyright law is to encourage creativity, and that only human beings can understand and make use of the incentives of the copyright law, and therefore, only the results of human creativity can be protected by the copyright law as works. [3]Countries with an author's rights system, as represented by Germany, generally agree that the originality of a work must be based on the subjective initiative of the author in the exercise of his or her ideas, thus distinguishing between the creative intellectual work of a human author and the mechanically repetitive intellectual work of an artificial intelligence.[4]

In judicial practice, there are also different judgments on the copyrightability of artificial intelligence generated products: as can be seen from the determination of the copyright of artificial intelligence generated products in the cases of Tencent v. Yingxun for Copyright Infringement and Unfair Competition[5] and Li v. Liu for Infringement of the Right to Distribute on the Information Network[6], China's judicial practice advocates that as long as the human authors have "a certain intellectual input" or have "personalised expression", it is possible to identify AI works as "intellectual achievements". As we can see from our judicial practice, as long as human authors have "certain intellectual input" or "personalised expression", it is possible to identify AI works as "intellectual achievements", i.e., a more open judicial standard based on the principle of anthropocentrism; while in the United States. "Zarya of the Dawn"[7], A Recent Entrance to Paradise[8] and sunset photograph "Suryast" copyright registration case[9], the U.S. Copyright Office has refused to register the AI-generated portions of these cases. It can be seen that in the practice of US copyright law, from the main purpose of copyright law to protect human creations, it is emphasised that human authors should have "sufficient control" over the works generated by AI, and that the elements of human authorship must be demonstrated in these aspects: the creative intention, creative process and creative result, etc. The actual result is to exclude the copyrightability of the works generated by AI autonomously.[10]

From the views of both sides of the above dispute, it can be seen that the key to solving the issue of whether the AI generation is copyrightable lies in solving the issue of whether the generation belongs to the "work" stipulated in the Copyright Law, which should start from the definition of "work" in the Copyright Law. Article 3 of the Copyright Law of China stipulates: "The works referred to in this Law refer to intellectual achievements in the fields of literature, art and science that are original and can be expressed in certain forms." It is easy to see that artificial intelligence generated products are mostly novels, paintings, music and so on, which satisfy the conditions of "in the field

of literature, art and science" and "capable of being expressed in a certain form". So the key to the discussion lies in whether they satisfy the conditions of "having originality" and "being capable of being expressed in a certain form". Therefore, the key to the discussion lies in whether it fulfills the two constituent elements of "originality" and "belonging to intellectual achievements". Therefore, to discuss whether AI-generated products can constitute works in the sense of the Copyright Law, we should mainly analyse them in terms of the judgement on the originality of AI-generated products and the determination of the attributes of intellectual achievements.

2.2. Analysis of the Originality of Artificial Intelligence Generated Products

Only an external expression with originality can constitute a work within the meaning of copyright law. The key to whether AI-generated products belong to works lies in the interpretation of their originality. On this issue, there are different doctrines in the theoretical circles. The objective theory of originality, which has a lower standard, holds that originality can be recognised as a work in the copyright law as long as it is a work in form without originating from human beings. As long as the work objectively meets the requirement of "minimum creativity", i.e., there is a distinguishable change from other existing works, then it has proved to be original. [11] Common law countries are more inclined to consider that the requirement of originality is satisfied as long as the AI-generated work reflects the personality of the author, even if it is only slightly different, regardless of the basis on which the personality was created.[4] The opposite view, such as the "author-centrism" born in the 19th century, holds that the human author is the centre of creation, thus establishing a higher standard of originality, that is, the subjective judgement of originality centred on the author.[3] The civil law countries, on the other hand, generally believe that originality must be generated by the author's subjective initiative in the exercise of his or her thoughts, thus distinguishing creative intellectual labour from mechanical repetitive intellectual labour.

The different determinations of originality of AI-generated products mentioned above are due to the choice of different standards of judgement, and the choice of the standard of judgement is affected by a number of factors. The standard of judgement for originality should not be too low or too high, and a compromise standard should be adopted for the following reasons:

The standard of originality should not be too low. Firstly, starting from the specific meaning of the concept of "originality", originality means that a work is created independently by its author and is not, or not essentially, a copy, plagiarism, plagiarism or imitation of an existing work. Originality emphasises that the author must use his or her own intelligence and skills independently to create the work. Independent creativity is manifested in the fact that the constituent elements of a work are chosen by the author himself, organised and arranged according to rules and sequences determined by himself, and express his true inner experiences and feelings, his true positions and opinions, his true thoughts and emotions.[12] From this we can see that if the resulting work only objectively meets the requirement of "minimum creativity", i.e., if there are distinguishable changes in comparison with other existing works, it is likely to be an imitation of an existing work, which does not reflect the author's intellectual skills and true feelings, and cannot satisfy the specific content of the concept of "originality" (i.e., the author's own choice). The concept of "originality" does not have a specific connotation. Secondly, from the viewpoint of the legislative purpose of the Copyright Law, Article 1 of China's Copyright Law stipulates: "For the purpose of protecting the copyright of authors of literary, artistic and scientific works, as well as the rights and interests related to copyright, encouraging the creation and dissemination of works that are beneficial to the construction of socialist spiritual civilisation and material civilisation, and promoting the development and prosperity of socialist culture and science, this Law is enacted in accordance with the Constitution. This Law is enacted." One of the purposes of the Copyright Law is to promote the creation and dissemination of works through the protection of authors, and ultimately to promote the development and prosperity of

socialist culture and science. If artificial intelligence generated products can be regarded as works only if they are slightly different from the existing works, it will discourage human authors from creating works. If the standard is too low, AI will produce a large number of low-quality products, which will not only occupy the living space of excellent works and lower people's appreciation level, but will even be detrimental to the development and prosperity of socialist culture and science.

The standard for judging originality should not be too high. From the perspective of the development of artificial intelligence technology, artificial intelligence technology is emerging and at the peak of its development, and high-quality artificial intelligence such as Chat GPT and Open AI are leading the development and change of science and technology, and are having a far-reaching impact on all walks of life. If too high a standard of originality is chosen, a large number of artificial intelligence generated products will not receive copyright protection, which will lead to the reduction of authors who use AI-assisted writing. This will result in fewer authors using AI-assisted writing, and investors and R&D personnel may be less motivated to invest in and research on AI, which is not conducive to the use and development of AI technology in the long run. Secondly, in terms of the legislative purpose of the Copyright Law, its ultimate goal is to "promote the development and prosperity of socialist culture and science", which shows that "work-centrism" is more in line with this goal, and there is no lack of high-quality content in AI-assisted writing, thus contributing to this goal. There is no lack of high-quality content in AI products, which can help to achieve this goal. Therefore, AI products created without the participation of human authors should also have the possibility to become works, so it is not desirable to exclude high-quality AI products by insisting on "author-centrism".

In summary, when choosing the level of originality standard, multiple perspectives should be considered, including the substantive connotation of the concept of originality, the purpose of the copyright law, the development of AI technology, etc., and it is more appropriate to choose a compromise standard.

2.3. Identification of intellectual achievement attributes of artificial intelligence generated products

Intellectual achievements refer to the spiritual wealth or spiritual products created by people through intellectual labour. The current emergence of deep learning, neural networks, big data and other technologies confirms that artificial intelligence breaks through the simple execution of established algorithms, subverts the status of artificial intelligence as a mere tool, and realises autonomous creation.[13] Artificial intelligence generators are intellectual achievements in the sense of copyright law for the following reasons:

First of all, from the perspective of the operating principle and technology behind the creation of artificial intelligence, its essence is the process of creation through intellectual labour. There are two technical paths for the creation of AI: one is "code definition", whose technical idea is essentially to simulate the human thinking process through code programming and transplant it to the machine; the other is "data training", which is a process of reading a large amount of text corpus quickly and forming the meaning of expression. The second is "data training", which is a process of reading a large amount of text corpus quickly and forming the expression meaning, and finally processing and synthesising it through a language model. [10]Take the process of generating poems by AI as an example: AI is based on the language model method, and the overall content of the poem is transmitted to the language model for training as a training corpus, and after the training is completed, some initial content is given first, and then the next word is sampled according to the probability distribution of the output of the language model, and the complete poem is generated by continuously repeating this process. [14]It can be seen that the creative process of AI is the same as the intellectual labour carried out by human beings in the creation, i.e., the input of existing knowledge is carried out

first, and then the knowledge is learned, and then the creative output is carried out. Artificial intelligence from "input" to "learning" to "output" of independent creative process to "anthropocentric" view of copyright. "Throughout the creative process of AI, there is almost no difference between the process of learning, thinking and expression of human beings, reflecting a certain degree of "intelligence", which is in line with the nature of "intellectual labour", and even if the creation process is carried out, it is not the same as the process of human learning, thinking and expression. Even if the subject of creation is not human, it meets the criterion of "generating content through intellectual labour".

Secondly, from the point of view of the external expression of artificial intelligence generated products, its appearance is no different from that of human works, which is in line with people's general perception of works in the fields of literature, art and science. Artificial intelligence generated products is an expression that highly conforms to the form of human-created works in terms of language style, narrative structure, grammatical construction, phrase construction, line style, and other forms of expression, and is capable of clearly conveying to the audience the information and ideas contained behind the words and symbols.[1] Texts, pictures, videos, etc. generated by AI can be read, understood and appreciated by human beings, and are not different from human works in terms of their external expressions.

Thus, the process of creation of artificial intelligence generated products can be regarded as "intellectual labour", and artificial intelligence generated products are no different from human works in terms of their expression, and have the attribute of intellectual achievements, which should be regarded as intellectual achievements in the sense of the Copyright Law.

3. The Issue Of Granting Legal Subject Status To Artificial Intelligence

3.1. The Necessity Of Clarifying The Legal Subject Status of Artificial Intelligence

In cases where the content generated by AI constitutes a work, it is necessary to clarify whether AI has the status of a subject under copyright law. As the core concept of the copyright subject system, "author" is the basis for clarifying the qualification of bearing rights, i.e. the attribution of copyright. "Author - work" has the logical connection of "subject - object" in copyright law; at the same time, "author - copyright owner" also has the logical connection of "subject - object". At the same time, "author - copyright holder" also forms part of the subject system.[10]

Firstly, with the rapid development of AI technology, the creative ability of AI machines in the fields of literature, art and science has been increasing, resulting in a large number of generative works that meet the constituent elements of a work, and the future will be an era of coexistence and co-creativity between human authors and creators of AI, and the clarification of the subject qualification of AI in the copyright law is a realistic need to adapt to the development of this technology. Secondly, the creation of AI works often involves multiple subjects, including developers, users and other possible contributors. Clarifying the subject qualification of AI in copyright law can help to reasonably delineate the rights and obligations of these subjects, safeguard the lawful rights and interests of the creators, and avoid disputes arising from unclear ownership. Finally, the development of AI technology has challenged the traditional legal system, and clarifying the subject qualification of AI is to make up for the legal gaps caused by technological progress, and helps to establish a legal system system that is more adaptable to the needs of technological development, which is an important part of promoting the improvement of the legal system.

To sum up, it is necessary to clarify the subject qualification of AI in copyright law in many aspects, including adapting to the realistic needs of technological development, safeguarding the legitimate rights and interests of creators, and promoting the improvement of the legal system.

3.2. Analysis of the Recognition of the Legal Subject Status of Artificial Intelligence

With regard to the subject qualification of artificial intelligence, there is a view that existing laws do not limit civil subjects to natural persons, and that with the development of society, it is possible for inanimate subjects such as legal persons and unincorporated organisations to be formulated as civil subjects.[15] On the contrary, it is believed that artificial intelligence itself should not be fitted as a "person", because it cannot exercise power and assume obligations.[13] By analysing the mechanism of the content generated by artificial intelligence, it can be found that it neither belongs to the natural person, nor possesses the attributes of group personality that can be fitted as a legal person, and cannot become a suitable civil subject.[1] Article 11 of the Copyright Law stipulates that "copyright belongs to the author", "the natural person who creates the work is the author", "a legal person or an unincorporated organisation presides over the work, and the work is created by the will of the legal person or the unincorporated organisation, and is created by the legal person or the unincorporated organisation on behalf of the legal person or the unincorporated organisation. A legal person or an unincorporated organisation is regarded as the author of a work created by its will and for which the legal person or unincorporated organisation bears the responsibility". According to this article, there are two types of subjects who can become authors and obtain copyright, one is natural person, who obtains the qualification of subject because of his subjective will and objective factual act of creation; the other is legal person, who becomes the "proposed author" because of his ability to create works in the name and will of the legal person, and to bear the relevant legal responsibility. The creation and development of artificial intelligence technology is challenging this human-centred system of copyright legal subjects.

Under the influence of "anthropocentrism", traditional copyright law adheres to the view that "a natural person (or an ensemble of natural persons) is the author", whereas the current deep learning technology of AI enables it to create more or even completely independently, mimicking the creative behaviours of human beings. creative behaviour. Artificial intelligence is tending to develop from weak artificial intelligence to strong artificial intelligence, and artificial intelligence with deep learning ability can imitate human decision-making, autonomously choose the optimal strategy and output predictions accordingly. The specific results of AI output often have a high degree of randomness and uncertainty, which cannot be predicted by the designer, and no one can directly decide the specific content of the expression generated by the AI[1], which means that the AI is able to autonomously carry out human-like creative behaviours. Although AI cannot be completely independent of human control at the technical level, nor does it have the unique emotional experience of humans, it is unreasonable to deny the possibility of its obtaining authorship simply because of this, and instead identify a natural person, who is barely involved in the creative process, as the author of the generated object. Although artificial intelligence does not have the heart and spirituality of human authors, it has demonstrated the ability to express thoughts and create in a human-like manner. [10] In the future, when artificial intelligence intervenes in creation or becomes the norm, it may be reasonable for the law to recognise the identity of "machine authorship" of artificial intelligence in a conditional and limited way[16]. According to scientists' predictions, based on the development trend of AI's evolvability, high efficiency and precision, intelligent robots in the future era may independently carry out their own intellectual creative activities, resulting in independently generated inventions and works.[17] In the future, it may become possible for the copyright law to recognise artificial intelligence as authors, i.e. to recognise artificial intelligence in specific situations as legal subjects by applying the legal technique of mimesis on the basis of the interpretative theory of positive law.[18]

Artificial intelligence does not have the conditions to become the subject of rights on the copyright law. First of all, artificial intelligence does not have civil rights capacity, civil rights capacity can only

be enjoyed by natural persons and legal persons, the essence of which is the rights given to human beings by law, artificial intelligence does not belong to human beings naturally can not enjoy; Secondly, artificial intelligence does not have civil behavioural capacity, artificial intelligence belongs to the objects dominated by human beings, and it does not have the ability of thinking, does not have the ability to independently carry out the expression of meanings, and also can't independently and autonomously Conduct civil activities, can not independently exercise power to fulfil obligations; Finally, artificial intelligence does not own their own property, can not independently assume civil liability, therefore, artificial intelligence does not have the right to subject qualification.

In summary, although artificial intelligence may be modelled as an author under copyright law, it should not be granted rights, thus imposing a separation between the subject of creation and the subject of rights. [10]As scholars in the United States have said, the copyright law for the protection of the work to grant exclusive rights, so as to incentive authors to produce creative incentives, to practice the purpose of the legislation of the right holder can only be natural and legal persons, but not artificial intelligence.[10]

4. Attribution of rights in artificial intelligence generated products

4.1. The need to clarify the attribution of rights in artificial intelligence generated products

Although it is possible for an AI to be formulated as an "author" and acquire the status of a creative subject under copyright law, it cannot become a subject of rights because it does not have the capacity for civil rights and civil behaviour. Artificial intelligence, as an object, has not only its creator, but also a new owner after the change of property rights, and its users. This results in the fact that the results of the generation of artificial intelligence involve multiple subjects, the developer of the artificial intelligence programme, the manufacturer and owner of the programme or equipment equipped with artificial intelligence, and the user of this programme or equipment, all of which are subjects that have a close relationship with the generated content.[19] In order to coordinate the legal relationship between the different subjects of interest involved in the generation of artificial intelligence, and to provide a more stable and favourable development environment for creativity in the field of science and technology and culture, it is necessary to clarify the attribution of the rights to the generation of artificial intelligence at the legal level.

Firstly, it is of great significance to solve the problem of attribution of the rights of artificial intelligence generated products s, and to clarify the distribution of benefits, in order to coordinate the legal relationship of relevant interest subjects. Artificial intelligence generated products that meet the conditions of the work will generate copyright once the creation is completed, which contains huge economic benefits, if the attribution of rights has been in a state of suspense may cause related disputes, not only is not conducive to the use and dissemination of artificial intelligence generated products , but also is not conducive to the stability of the order of the copyright market, so in this case, in order to make the social relations tend to stabilise, a clear attribution of rights of artificial intelligence generated products is of great significance. In this case, in order to stabilise social relations, it is of great significance to clarify the attribution of the rights of artificial intelligence generated products.

Secondly, clarifying the attribution of the rights of AI-generated products is conducive to motivating the relevant subjects to use AI for creative work, and also helps to promote the development of AI technology. Artificial intelligence from the program design and development, to the creator to use it to create, need to relevant subjects to invest a lot of money, time and intellectual labour, to the artificial intelligence user or developer empowerment can make their efforts to get the corresponding feedback, which is conducive to motivate the author to use artificial intelligence to

create, and at the same time to encourage the relevant investors and technology research and development personnel to increase investment, to improve the level of artificial intelligence creation, so as to create more and more high-quality generative works. Thus, more and higher quality generators are created. If the ownership of AI products remains unresolved, the relevant interests cannot be effectively protected, which in the long run will discourage the creation and research and development of the relevant subjects.

4.2. Disputes over the attribution of copyright in AI-generated material

Currently, there are many controversies regarding the ownership of copyright in artificial intelligence generated products. The dominant view is that copyright should be vested in the user,[20] In addition, there is the view that it should be vested in the investor; [21]There is also a minority view that copyright should be vested in the AI, [22]There is also the view that it should be vested in the public domain, or as the case may be[23].

The view that the copyright of artificial intelligence generated products belongs to the user has strong rationality. According to the relevant provisions of the Copyright Law[24], the author becomes the original subject of copyright according to the principle of "automatic acquisition of rights" when the work is created.[25] Section 9(3) of the UK Copyright, Designs and Patents Act provides that the author of a computer-generated work is the person who made the necessary arrangements for the creation of the work. The user of artificial intelligence is the natural person who creates the generated work, and before creating the work, he or she has certain ideas about the content of the generated work. When using artificial intelligence to create the work, he or she learns from the input material, inputs commands, and sets up prompts and other operations, which have an important impact on the content of the generated work. If the generated work created by the user complies with the constituent elements of a work, the natural person who creates the work is justifiably entitled to all or part of the copyright of the work. If the work created by the user meets the constituent elements of the work, it is justified for the natural person who created the work to obtain the copyright of the work in whole or in part.

The view that the copyright of AI generators should be attributed to investors has some flaws, but also has some rationality. Investors have invested a great deal of capital and manpower in the design and development of artificial intelligence, and if the interests of investors are not reasonably protected, it is difficult to incentive investors to invest in long-term investment in and research and development of artificial intelligence, which may affect the vitality of the industry's continuous innovation, so using the principle of investment in the attribution of copyright in AI generators is more in line with the special characteristics of artificial intelligence.[26]

Pamela Samuelson in "Assigning Ownership in Computer-Generated Work" states that the investor in a computer programme should be regarded as the author of the generated work if it contains a large number of modules with recognisable expressions from the original programme.[4]The domestic artificial intelligence painting website WenXinYiGe stipulates in its Service Use Agreement that "the intellectual property rights and related interests arising from the Service belong to us or our affiliates". [3]The investor's "non-creative" input to the AI generates the product, and the investor's interest should be the focus of the protection of the relevant legal system. [27] It can be seen that most of the arguments in favour of attribution to the investor-developer are based on the protection of the interests of the person concerned and the motivation of research and development.

However, the problem with the above "incentive to invest" argument is that it ignores the different business ecologies of investing in AI and creating works, as the business model of AI is a technological for-profit one, which can be achieved in a variety of ways, and in many cases the licensing of the technology itself is sufficient to make a profit. Given that the business model for

realising the profitability of AI technology is to achieve profitability through the payment of a corresponding consideration by the user, not recognising artificial intelligence generated products as works and providing them with copyright protection will not affect the investment in AI technology.[13] This viewpoint is also flawed in terms of jurisprudence, as the essence of copyright protection is the "expression of ideas", i.e. not only the existence of ideas, but also the existence of a "work", which is not only the expression of ideas. The essence of copyright protection is "the expression of ideas", i.e., not only ideas, but more importantly, the formation of expression with a certain form of manifestation. According to this essence, it is not appropriate to include civil subjects such as owners and investors of artificial intelligence generated products in the original subject of artificial intelligence generated products, which of course does not prevent them from becoming the successor subject of artificial intelligence generated products through contractual agreements.[4] However, if the artificial intelligence generated products is generated by the AI itself, i.e., the user does not contribute to the generated content or the contribution is negligible, then the attribution of copyright to the investor is also reasonable to a certain extent.

There is also the view that AI can be given a virtual legal personality and copyright can be attributed to AI, which is not practicable in reality. In 2016, the EU proposed draft legislation on granting AI an independent legal status, proposing to formulate AI as an "electronic person" (electronic persons) to enjoy legal rights and assume legal obligations and legal liabilities, and gave four characteristics for determining AI in the draft. persons" (electronic persons), so that they enjoy legal rights, bear legal obligations and legal liabilities, and in the draft gave four characteristics for determining artificial intelligence. [28] However, such a viewpoint is contrary to the basic principles of civil law and has certain difficulties in judicial practice. Combined with the legislation and major doctrines of China and other copyright developed countries, it is still difficult to accept artificial intelligence as the subject of creation and not in line with the basic principles of civil law. Moreover, since artificial intelligence itself does not have the status of civil law, artificial intelligence does not have the ability to exercise civil rights, so that human beings and artificial intelligence can not make agreements and establish contractual relations, which also makes it difficult to take the path of indirectly obtaining the status of the main body of the copyright law.[4]

There is also some validity to the view that artificial intelligence generated products should be in the public domain. artificial intelligence generated products do not constitute works under copyright law and should be in the public domain.[29] The foreign website Dream studio clearly states in its FAQ that images produced by the website will be copyright-free works in the public domain, which means that the public can use the artificial intelligence generated products in question without restriction, including for commercial purposes. It seems unreasonable to attribute copyright to the user of an AI-generated work that was created by the AI with little or no contribution from a natural person, and since it is difficult to identify the owner of such a work, attributing copyright to the public domain would be a suitable solution.

Another view is that the ownership of AI-generated materials should be decided on a case-by-case basis, which also has some merit but may cause difficulties in practice. The principle of determining the attribution of copyright in artificial intelligence-generated objects should also be analysed on a case-by-case basis, rather than across-the-board. Some scholars have proposed creationism, ownership, agreement, and believe that specific problems should be analysed, and can be used at the same time. [14] This point of view in theory is very complete, but in judicial practice there may be difficult to operate and other defects, the specific circumstances to be combined with practice to further test.

In summary, from the perspective of the Copyright Law, according to the "principle of automatic acquisition of rights", a user who has invested intellectual labour in an AI creation is the creator of the creation and should be granted the copyright of the creation. If the artificial intelligence generated

products lacks the necessary intellectual input of the human author or does not have the originality necessary to become a work, in such cases, it is reasonable to attribute the generated object to the public domain.

4.3. The Construction of a Copyright Attribution System for Artificial Intelligence Generated Products

The system of attribution of copyright in artificial intelligence generated products should be constructed on the basis of the existing copyright law, and the attribution of rights should be discussed in different situations, depending on whether or not the user has made the necessary participation in the formation of artificial intelligence generated products. A basic system should be established under which the copyright belongs to the user if the user has had the necessary participation in the creation of the artefact, to the investor if the user has not had the necessary participation, and to the public domain under special circumstances.

Firstly, according to the "automatic acquisition principle" of the copyright law, the user of artificial intelligence should be the main subject of the attribution of copyright in the content generated by artificial intelligence. It should be noted that the premise of the user to obtain the copyright is the necessary participation in the content generated by artificial intelligence, that is, in the process of creation, the human author is the main body of creation, artificial intelligence as a creative tool to assist the creative activities of human beings, and play a role in enriching the mode of human spiritual production, and enhance the vitality of human intellectual creativity. Here, AI is always under the control of human beings and does not completely replace human beings. [28]The user should make a "substantial contribution", i.e., contribute to the essential properties of the product and actively participate in the creative process. The user of the AI is eligible to obtain the copyright of the generated content after the above prerequisite of "the necessary involvement of the human author" has been fulfilled for the following reasons: from the perspective of the whole creation process, the user pays a certain consideration for the right to use the AI, and then inputs the existing works into the AI for data training; thereafter, the user Afterwards, the user makes necessary instructions and arrangements for the generated content according to his/her own creative will, and the AI generates a work that meets the requirement of originality, and according to the "automatic acquisition principle" of the copyright law, the user obtains the copyright of the work. This design is similar to the original system of the Copyright Law, which is conducive to ensuring the stability of the Copyright Law and better adaptation by the relevant subjects, and also serves the purpose of stimulating the creation and dissemination of works.

Secondly, the copyright in the artificial intelligence generated products may also be attributed to the investor. There are two possible scenarios: the first is that the user does not have the necessary involvement in the creation of the artificial intelligence generated products to obtain copyright in the object; the second is that the user has agreed in advance on the attribution of rights in a use agreement with the company owning the AI. In the first case, the user's instructions to the AI are limited to the level of thought, without deciding or influencing the expression, and the entire process of creation of the generated product is carried out by the AI independently, the user's contribution is too small and does not make a substantial contribution to the generated product, in such a case, if the user obtains the copyright of the generated product it would be biased, and the investor of the AI, as the owner of the AI, is not entitled to the copyright of the generated product. As the owner of the AI, it is more reasonable for the investor to obtain the generation created by the AI product. This system design is not only conducive to protecting the interests of investors, but also conducive to improving the enthusiasm of the relevant subjects to invest in the field of artificial intelligence creation. The second situation is that before the user uses the AI product, it is clear that the agreement on the rights of the generated material belongs to the company that owns the AI, and according to the principle of

"respecting the autonomy of the parties", the copyright of the content generated by the AI belongs to the investor if it constitutes a work of authorship.

In addition, there are cases in which the copyright in an artificial intelligence generated products is vested in the public domain. If the AI creates the generated object on its own, with little or no participation by the user in the creation process, and the company to which the AI belongs explicitly renounces the copyright in artificial intelligence generated products, in such a case, the artificial intelligence generated products should be attributed to the public domain.

5. Conclusion

The unstoppable development of artificial intelligence technology is having a profound impact on the production and life of human beings, triggering unprecedented changes in various fields such as culture, art, scientific research, education, etc., which has led to copyright-related issues and put forward new requirements and challenges for legal regulation. The issues of copyrightability of artificial intelligence generated products, the qualification of the legal subject status of artificial intelligence, and the attribution of rights have become more complicated and need to be solved urgently. For a series of copyright issues arising from artificial intelligence generated products, copyright law should maintain an open and rigorous attitude, not only adapting to the changes brought about by the development of science and technology, but also seeking a balance between respecting the objectives of copyright law and safeguarding the interests of various rights holders. We should continue to explore the legal system and reflect on the judicial practice, so that the copyright law will have a new vitality in the new era of science and technology.

References

- [1] YANG Lihua. *Exploration of the Copyright Problem of Artificial Intelligence Generated Objects*[J]. *Modern Law*, 2021, 43 (04): 102-114.
- [2] Zhang Xinbao, Bian Long. *Study on the Copyright Protection of Content Generated by Artificial Intelligence*[J]. *Comparative Law Studies*, 2024, (02): 77-91.
- [3] Wang Qian. *Re-examination of the characterisation of content generated by artificial intelligence in copyright law*[J]. *Politics and Law Forum*, 2023, 41 (04): 16-33.
- [4] Ye Zhaoche. *Infringement and Solution Path of Artificial Intelligence Generated Objects*[J]. *Journal of Central South University for Nationalities (Humanities and Social Sciences Edition)*, 2024, 44 (05): 156-163+223.
- [5] Shenzhen Tencent Computer System Company Limited and Shanghai Yingxun Technology Company Limited, *Copyright Infringement and Unfair Competition Dispute*, Shenzhen Nanshan District People's Court (2019) Yue 0305 Minchu 14010 Civil Judgement.
- [6] "AI Wenshengtu" Copyright Case - Li Mou and Liu Mou Copyright Infringement Dispute Case, Beijing Internet Court (2023) Beijing 0491 Minchu 11279 Civil Judgement.
- [7] United States Copyright Office, *Re: Zarya of the Dawn* (Registration # V Au001480196), 21 February, 2023, <http://www.copyright.gov/docs/zarya-of-the-dawn.pdf>.
- [8] Copyright Review Board of US Copyright Office, *Re: Second Request for Reconsideration for Refusal to Register A Recent Entrance to Paradise* (Correspondence ID 1-3ZPC6C3; SR # 1-7100387071), Copyrightgov. (14February2022), <http://www.copyright.gov/rulings-filings/review-board/docs/a-recent-entrance-to-paradise.pdf>.
- [9] Copyright Review Board of the US Copyright Office, *Re: Second Request for Reconsideration for Refusal to Register SURYAST*(SR#1-11016599571. Correspondence ID:1-5PR2XKJ), 11December2023, <http://copyright.gov/rulings-filings/review-board/docs/SURYAST.pdf>.
- [10] Wu, H.-D. *On the Copyrightability of Content Generated by Artificial Intelligence: Practice, Jurisprudence and Institution*[J]. *China Law Review*, 2024, (03): 113-129.
- [11] Lu Haijun: *The Theory of Copyright Objects* (Second Edition), Intellectual Property Publishing House, 2014, pp. 156-157.
- [12] Wu Handong, *Intellectual Property Law* (Sixth Edition), Peking University Press, 2022 edition, p. 51
- [13] Liao Si: "On the Composition of Originality and the Attribution of Rights in Artificial Intelligence Creations", in *Journal of Northwest University for Nationalities (Philosophy and Social Science Edition)* Issue 2, 2020, p. 80.

- [14] Xu, Jia-Li. *Copyright Attribution of artificial intelligence generated products [J]*. *Journal of Jinan (Philosophy and Social Science Edition)*, 2023, 45 (04): 37-49.
- [15] *The Reconstruction of the Work in Office System and the Choice of Copyright Attribution Path for Artificial Intelligence Works*", *Law Review*, No. 3, 2020.
- [16] Yang Lixin, "Artificial Class Personality : The Civil Law Status of Intelligent Robots--Another Essay on the Civil Liability of Intelligent Robots Causing Human Damage", in *Seeking the truth Journal*, No. 4, 2018.
- [17] Wang Han, "A Comparative Study of Artificial Intelligence Patent Protection in Europe and the United States, " in *Journal of East China University of Science and Technology (Social Science Edition)*, No. 1, 2018.
- [18] Chen Jidong, "On the Legal Personality of Robots - A Discussion Based on Legal Interpretation, " in *Journal of Shanghai University (Social Science Edition)*, No. 3, 2018.
- [19] Tao Qian: "On the Protection of Artificial Intelligence Generated Achievements by Copyright Law On the Protection of Artificial Intelligence Generated Achievements by the Copyright Law ", *Jurisprudence*, No. 4, 2018, p. 13.
- [20] Sun Jianli: *The user has a closer relationship with a particular work in space and time and is the subject who directly triggers the birth of the work. Yi Jiming: As far as the legal concept of author is concerned, the natural person who creates a work is the author.*
- [21] Aizen Lee: *Developers, as owners of AI, have invested a lot of capital and manpower.*
- [22] UNESCO: *In 2016 the EU proposed draft legislation on giving robots an independent legal status.*
- [23] CaoBo: *artificial intelligence generated products does not constitute a work under copyright law and should be in the public domain.*
- [24] *Article 11 of the Copyright Law: Copyright belongs to the author, unless otherwise provided for in this Law. The natural person who creates a work is the author. A legal person or an unincorporated organisation is regarded as the author of a work that is created under the auspices of a legal person or an unincorporated organisation, on behalf of the will of the legal person or the unincorporated organisation, and for which the legal person or the unincorporated organisation assumes responsibility.*
- [25] Wu, H.-D. *Questions on the Copyright Law of Works Generated by Artificial Intelligence[J]*. *Chinese and Foreign Law*, 2020, 32 (03): 653-673.
- [26] Li Aizhen. *Exploration and inspiration of the copyright protection of artificial intelligence generation in the United States[J]*. *Electronic Intellectual Property Rights*, 2020, (11): 81-92.
- [27] Xu Mingyue, Tan Ling. *On the Protection of Neighbouring Rights of Artificial Intelligence Creations - Theoretical Evidence and Institutional Arrangement[J]*. *Comparative Law Studies*, 2018, (06): 42-54.
- [28] UNESCO Science Experts Expolre Robots' Right, [http: //www.unesco.org/new/en/media-services/single-view/news/unesco_science_experts_explore_robots_rights/](http://www.unesco.org/new/en/media-services/single-view/news/unesco_science_experts_explore_robots_rights/)
- [29] Cao Bo, "The Discussion on the Intellectual Property Attributes of Artificial Intelligence Generated Objects ", in *Comparative Law Studies*, No. 4, 2019, pp. 148-149.