

Copyright protection of artificial intelligence-generated works: Case study of artworks

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Abstract. In recent years, the rapid advancement of artificial intelligence (AI) has led to various creative practices in daily life, particularly in the field of art, which brings new legal challenges around copyright and AI-generated artwork. In previous marketing research, numerous studies have examined whether copyright can safeguard the rights of authors across different types of work, and have discussed the ownership of copyright in AI-generated artwork. However, a research gap remains between the connection of copyright law and AI-generated artwork. Moreover, under the prevailing legal framework, there is no specialized legislation to regulate the interaction between copyright law and AI-generated artwork, as well as the ownership of the copyright of the AI-generated products. Therefore, through a comparative analysis of cases about AI-generated artwork and related copyright law about AI products, this article will examine the legal nexus between copyright law and AI-generated artwork in order to fill the research gap around copyright law and AI-generated products.

Keywords: Copyright, AI-generated artworks, Intellectual property law.

1. Introduction

Copyright is the legal right to intellectual property. With more and more people choosing to use artificial intelligence (AI) to create their artworks, the problems between copyright and AI appear. For example, who deserves to own the copyright, and the conditions for obtaining copyright protection. Firstly, various authors have different opinions on the criteria for gaining copyrights. According to the National Copyright Administration of China, these copyrighted products should be produced by authors alone with originality, which means human originality is a condition of copyright [1]. Therefore, it is important to recognize whether it is human creativity or human choice, as it may decide whether the artwork includes personal thinking, thus deciding whether it should be copyrighted or not. Some authors also talked about this in their essays. Jessica L. Gillotte said in her article in 2019 that the standard of original works is that it must be independently created and embody some minimal amount of creativity [2]. Moreover, some authors believe the artworks that can be copyrighted should connect with the human mind and show their intelligence. One of the cases from Beijing involves a judge who agreed with the prosecutor's claim because "the pictures involved in the case are directly generated based on the plaintiff's intellectual input, reflecting the plaintiff's personalized expression" [3]. Therefore, products with human intelligence can be copyrighted. In the current literature, if a work wants to be copyrighted, the consensus has been reached that the work must reflect the originality of the author. However, there is not much discussion and consensus on whether the form of expression will affect the originality of the author, which means that even though the works show the thinking of humans, they still have the possibility to mix with others' originality in invisible ways.

Secondly, legal scholars in the industry have also studied the scope of conditions for AI products to qualify for intellectual copyright in their research articles. Two aspects can help with defining whether AI products meet these criteria, namely, whether the artworks created from AI can illustrate authors' originality and thinking or whether the ideas that show on the artworks are innovative. Li Wen said the repeated adjustment of human keywords in AI-supported creation has achieved the requirement of originality, and she also suggested that these actions can represent people's minds. At

the same time, Gia Jung believed electronic devices do not need to be pushed by humans either [4]. Some argue that it is also important to identify whether these AI works are suspected of copying and plagiarism, as they believe that there is an implicit risk that arranged code will copy the rest of the work, and training AI technology may produce nearly identical drawings that infringe on the copyright of the original author [2] [5]. But this might not be a crime because they might have their own mind without human interaction [6].

Thirdly, there are also different opinions from various articles about the right of ownership of those copyrighted AI artworks. Some believe the authors of the images own all the copyright because of their intellectual input, and AI as a technology should not be subject to authority, while others suggest the developers who invent AI tools should share the rights with the authors because they both pay for code and intellectual keywords for it [7] [8]. There are a few people who think that AI should have rights because they built it [6].

In this article, the copyright protection in artificial intelligence-generated work will be discussed in three parts. The first part is about the reasons and criteria for gaining copyrights, including the reasons for the generation and implementation of copyright, and the relevant contents of the conditions that meet the criteria of copyright will be discussed. The second part is about the conditions of obtaining copyright for AI-generated products. The relevant contents of whether AI-generated content can own copyright and the conditions of obtaining copyright for AI-generated products will be discussed. In the last part, the ownership of the copyright of AI works under the premise of meeting the conditions for obtaining copyright will be discussed.

2. Criteria for gaining copyrights

In the Copyright Law of the People's Republic of China, Chapter 1, says, "To protect the copyright of authors of literary, artistic, and scientific works, as well as related rights associated with copyright, to encourage the creation and dissemination of works that benefit the construction of socialist spiritual civilization and material civilization, and to promote the development and prosperity of socialist culture and scientific undertakings, this law is enacted in accordance with the Constitution" [1]. Therefore, to achieve and maintain the goals that copyrights expect, it is important to ensure that the criteria for gaining copyrights are met in order to create a better literary and artistic atmosphere in society.

2.1 Reasons for protecting copyrights

Before talking about the criteria for the products that can gain copyrights, recognizing the reasons for protecting copyrights is important. First, establishing copyright protection for various works is to safeguard the rights of original creators over their works. As previously noted, the Copyright Law of the People's Republic of China defines copyright law as a means to protect the rights and interests of authors in literary, artistic, and other fields. In other words, copyright law is designed to enable authors to protect their ability to enforce their rights over their own creations through legal mechanisms [1]. Therefore, through copyright law, creators do not need to worry about being infringed.

Second, building copyrights in order to protect the rights of the creators of copyrighted products can enable them to maintain their initial creative motivation. General Secretary Xi Jinping stated, "Protecting intellectual property rights is protecting innovation.", thereby contributing to the advancement of social and spiritual civilization and material civilization [9]. Being protected by copyright law allows them to preserve their creative intentions and prevents them from abandoning or losing hope in their works due to infringement of their rights. In the case of *Mitchel v. Reynolds* in 1711, the court mentioned that "a grant of the sole use of a newly invented art, and this is good, being indulged for the encouragement of ingenuity", which further substantiates one of the key reasons for copyright law: to encourage creators to continue their creative endeavors [10].

Thirdly, there are some aspects that are about economics. According to Xiaoqian Ban and Jin Zhang, “according to the principle of law and economics, copyright owners should gain profits by selling products, so as to achieve positive profits, that is, positive utility, so as to ensure that copyright owners have enough motivation to innovate”[11]. This means, in theory, the author’s earnings are positively correlated with the author’s motivation. Therefore, protecting the intellectual property rights of those copyrighted products can ensure the income for the authors, maintaining their daily income and their basic living standard. Good regulation on copyright on those products can encourage people to create more products with such good quality, thus, good for the future economy of the society.

2.2 Criteria for gaining copyright

There are different opinions from various scholars about the standard for gaining copyright. By researching materials available online, such as literature and journals, as well as reading books related to copyright, the following is a list of the conditions for obtaining copyright protection for several types of works and an explanation of these conditions.

Originality is one of the criteria for gaining copyright. In the book *Copyright Law*, Xiaoqing Feng proposes that “the term ‘originality’ refers to the requirement that a work must be the result of the author’s personal independent thought, with the author utilizing their own skills and creativity, and representing the fruits of their intellectual labor. It should not be derived from plagiarism or copying from others” [12]. This means that if someone creates a new work and presents it to the public first, that product can be copyrighted because this proves that the idea and thinking of the product are from the author. According to the book *Copyright Law*, “the originality of a work first refers to the innovation of its expression form. It does not require that the themes and ideas expressed in the work are novel and unique, but as long as the author independently creates them, they should be regarded as having originality”[12]. Therefore, it is not enough to determine whether a work is the first to appear and contains the author’s thoughts and ideas, because it is difficult to define whether the idea is the result of the author’s private self-reflection or obtained through a second channel, such as learning about an idea from a friend and then turning it into their own work. In this case, it is clear that simply looking at this point alone cannot determine who the copyright law provides the rights to in a fair and correct manner. Thus, other criteria are needed to decide the ownership of the power of copyright.

Creativity is the second important criterion for gaining a copyright. Gillotte pointed out that “an original work of authorship must be independently created by the author and embody some minimal amount of creativity”[2]. When a work shows the author’s personalized expression, it can indicate that the work has novelty and creativity [2]. Thus, ignoring those subtle overlaps, it can almost be said that personalized expression equals creativity. However, it is hard to consider the range of creativity. Sun Haoliang put forward that “The issue of determining the originality of works is an enduring topic in the field of copyright law. Ascertaining originality is not only a prerequisite and foundation for the establishment of a work but also a preliminary issue for copyright protection [13]. This means that in patent law, there is a very specialized interpretation of “novelty”, and novelty can be said to be one of the main criteria for creativity. But it is difficult to define the scope of creativity, because it has subjective conditions; If researchers want to pursue objective facts, things become more and more cumbersome. Therefore, creativity can only be one of the criteria.

Furthermore, presenting the products in some visible or tangible ways is also important to meet the criteria of gaining a copyright. In the book *Copyright Law*, “the emergence and existence of copyright must depend on some form of material carrier” [12]. If a work has not been publicly published, such an idea is not recognized at the legal level, which means that once even a work of the same idea is born, even if it can be proved that the work was completed earlier, there is no way to obtain copyright. Therefore, the attachment of the work is very important, which is a causal relationship. Because it was born before, in other words, it was written and published; thus, it can be copyrighted.

3. Criteria for gaining AI-generated copyrights

As artificial intelligence developed rapidly, machines are now allowed to paint or generate artworks, which brings more abundant forms of art products. However, it also results in several problems with copyright. Therefore, explicitly understanding the criteria for gaining AI-generated copyrights is important.

3.1 Can AI-generated Content get copyrights at all

From some people's perspective, such as Liu Lincui, artwork that is finished by AI tools can be protected by the copyright law. AI-generated work can represent the connection between the user and the work. According to Liu Lincui, "Humans are the central subject, and these machines should be seen as products of human production"[14], which means that even though these products are created or finally produced by the AI tools, they all contain the thinking and wisdom from the authors. This is because authors need to input the keywords and the ideal form they want in the AI procedure in order to create the ideal work. Therefore, most of the AI-generated work can be protected by copyright. However, the use of keywords for AI painting or art creation is based on its complexity, as Li Wen said: "Considering the impact of these keywords on the final painting effect, the keywords are repeatedly tried and adjusted"[14], because the works produced by simple keyword instructions are only the results of AI searching for matched parts of a corresponding work according to big data and piecing them together.

Moreover, the AI-generated work is based on the programmer's intelligence; Thus, it can also be said that AI-generated work is created by humans instead of artificial intelligence. From Jian Gongbo's article, he mentioned the case of "Beijing Internet Court adjudicated the first case of artificial intelligence painting copyright" [7], and the case emphasizes that "The images are directly generated based on the user's intellectual input and reflect their personalized expression", further proving that AI-generated works include originality from human input, so they are permitted to be protected by the copyright law. However, people like Shen Jiawei argue that these AI works are not allowed to stay under the protection of copyright. One of the reasons is that AI tools could bring a serious problem of similarity. "Certain components, overall composition, or expressive elements of the artistic output in AI-generated paintings are identical or substantially similar to the data of existing artworks used as training materials and creative sources" [5], this is because all the data and producing techniques are based on existing products on the internet. Therefore, although people will improve their key words in order to own a "perfect" products, the styles and contents may similar to some part of work on the internet through painting with AI tools. Thus, these AI-generated works cannot be protected by copyright law.

The other reason for the statement is that AI-generated work does not contain a human's painting skills. Even though the AI software is developed by humans and the creation of works is initiated by human-provided keywords, this does not affect the fact that the AI software searches the internet for relevant techniques and styles during the creative process, ultimately making what it deems to be a fitting output. Therefore, AI-generated works are essentially completed by AI tools. According to Murray, "[non-fungible token] [NFT] is a product entirely generated by machines," so it is not human-related, so it cannot be protected by the copyright because of under copyright law and patent law-but the courts and copyright office also are making a point: no human author means no copyright [15]. However, I do not agree that products made by artificial intelligence should be copyrighted under any circumstances. And these details need to be detailed, such as what kind of painting style, where to add what small details. Because I think that when these AI works are tweaked by human efforts, they can be copyrighted.

3.2 Criteria for gaining AI-generated copyrights

For a long time, academia and the legal community have debated what kind of AI works deserve copyright. The following points of view from relevant literature differ from ordinary copyright law

standards to demonstrate what types of AI works can be protected by copyright. Firstly, the AI-generated products should contain a large proportion of human creativity, whether from the programmer or the user. According to Xiulan Chen, “In the generative AI design stage, creation stage and content completion stage, it can reflect the integration of human wisdom and contribution, reflecting human intervention and choice on artificial intelligence” [16]. It is precisely because even in the process of using AI products, whether it is accurate keywords attached to AI tools or the final artistic product, human thinking is involved throughout the whole process. Therefore, when an AI-generated artwork covers a large number of human thoughts, it can reflect the personality of human beings and can be protected by copyright in the copyright law. Moreover, as Zhan Shuo mentioned in his article, “The content of Artificial Intelligence Generated Content (AIGC) is not meaningless, out-of-order symbols, but has a definite style and a specific structure” [17], where AIGC means the content created or generated by artificial intelligence technologies. This also shows that the AI-generated product is painted by AI tools and contains the characteristics of human works, so it can be identified as showing human intellectual achievements, and these products should be protected by copyright.

Secondly, This means that in the process of creating a work, originality does not mean that everything in a work must be an author’s original thinking, but there are differentiation between the new outcomes and finished outcomes after the completion of the work, whether it is in style, language or theme, as the book *The Evolution of Modern Intellectual Property Law: The British Journey* mentioned, “We can use this part to identify each work, to confirm the existence of the work when the form of expression is transformed, and to avoid harm to the sustainable development of the culture as a whole” [6]. Therefore, AI-generated works that meet this condition should enjoy copyright protection.

To sum up, to judge whether a work produced by AI should enjoy copyright protection, it is not only necessary to see whether the work itself meets the conditions required by the original copyright law, such as originality and the performance of the author's intellectual achievements, but also to be satisfied that the AI work contains a lot of human thinking, proving the human thinking process and continuing to express the originality exclusive to AI.

4. Ownership of AI-generated copyrights

It is really controversial about who owns the copyright of the AI-generated work. Some people believe that the ownership of AI-generated work is human. As the mentioned case of the Beijing internet court emphasized, since the creation of AI-generated works requires continuous human input and modification of keywords, it inherently contains human thought and intellect. As Jian Gongbo said, “The images are directly generated based on the plaintiff's intellectual input and reflect their personalized expression”[18]. Therefore, it can be argued that AI-generated works represent a form of intellectual expression by the author. As a result, the copyright for these AI-generated works should rightfully belong to the author.

However, others argued that the copyright should be owned by the AI tools themselves in order to prevent unsuitable usage. Zou Haiyang mentioned that, “It is recommended to retain the right of attribution for AI-generated content to clarify its origin and prevent misuse” [19], meaning that endowing AI tools with copyright is a way to protect the market with originality, creating a further abundant artistic atmosphere. To conclude, the ownership of AI-generated products will be decided by the following conditions. Firstly, an application is required for only the ownership of copyright on code. Code, as a part of the composition of computer software, plays an important role in the operation of the software, and there will be no computer or technique-related products without code. Therefore, in order to protect the effort and benefits from the pioneers of AI tools, AI creators can apply for copyright for the code of AI software separately.

Secondly, to show the final effect of the AI-generated products, the AI users have input their knowledge and intelligence when using the AI tool, and made their own decision, which can prove

that users have creativity when using AI tools. When users are using AI software to create works, in order to achieve more exquisite and expected AI works, they will modify, delete or add keywords input into the AI software multiple times. During this process, the users not only utilize the ability of collecting data from AI tools, but also invest their wisdom in meeting the requirements for creating works. Therefore, the AI-generated products are unique after adjusting the keywords and inputting the intelligence from the users multiple times, further proving that these AI-generated products are creative, and thus, can be granted copyright.

If AI itself owns copyright, it cannot make compensation when it infringes upon others' copyright. Therefore, it is difficult to determine the direct cause of infringement-- whether it is the AI tool, AI developer or AI user when the infringed party claims compensation for infringement. Even if it is clear that the infringement is directly caused by the AI's actions, it is still very difficult to determine the party responsible for compensation. Therefore, if it is agreed that the AI itself holds the copyright, it may bring about a series of issues regarding the attribution of liability for compensation.

5. Conclusion

In recent years, artificial intelligence (AI) has become a common occurrence for people. For the field of art, multiple creative methods have brought unlimited possibilities to the art industry and facilitated art creators at the same time. However, because of the ambitious definition of AI-generated artwork by copyright law, the copyright dispute between the two is hard to decide. Therefore, it is particularly crucial to focus on both the qualification criteria for copyright protection of AI-generated artwork and the ownership of the copyright after obtaining protection under copyright law, between copyright law and AI-generated artwork. The author argues that AI-generated artwork should contain a significant proportion of human creativity and show a difference from existing works. Regarding the copyright ownership, the author proposes a framework: firstly, the code of the AI tools can apply for the ownership of copyright; secondly, the protection will be provided to the AI-generated artwork that is unique. This dual-protection mechanism ensures equitable protection for both authors and AI tool inventors in the AI artistic process.

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