

Legal Attributes of AI-Generated Images in Copyright Law

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Abstract. The use of artificial intelligence (AI) to generate images has become a trending method of content creation, yet many controversies still surround the legal attributes of AI-generated images. An analysis of the definition of works in copyright law reveals that assessing “originality” is key to determining whether AI-generated images can be recognized as works. The academic community holds both affirmative and negative views on the legal attributes of AI-generated images. Based on this, an analysis of the current two theories from the perspective of originality suggests that the legal attributes of AI-generated images should be comprehensively considered from both subjectivity and objectivity perspectives. This includes taking into account the individual’s subjective contribution to creation and whether the generated images themselves constitute works in the sense of copyright law. Therefore, the core of judging whether the artificial intelligence generated map can constitute a work lies in the degree of correlation between the originality contribution of human beings and the originality of the generated map in the process of artificial intelligence creation. The generated map with a high degree of correlation is the “work”, and its copyright should also belong to the user.

Keywords: AIGC, Copyright Law, AI-Generated Images.

1. Introduction

In 2023, the application of AIGC (Artificial Intelligence Generated Content) technology, represented by ChatGPT, in literature, music, images, and other fields, once again aroused people’s attention and discussion regarding the copyright issues of AI-generated content. In particular, the “AI-generated images” case, heard by the Beijing Internet Court in 2023 [1], drew attention from various sectors. In this case, Li used the open-source software Stable Diffusion to generate an image by entering prompt words and then posted it on a social platform. Liu, on another social platform, published an article featuring the image without Li’s permission, prompting Li to sue Liu. During the trial, the court examined the controversial focus of the case, namely, whether the disputed image constituted a work, what type of work it constituted, and whether the plaintiff owned the copyright to the disputed image. The Beijing Internet Court held that the disputed image involved the intellectual input of the plaintiff, reflecting the personalized expression of the plaintiff, and therefore met the requirement of “originality” for a work, supporting the plaintiff’s litigation request.

As the first case in China to recognize the copyright of AI-generated content, the judgment provides certain guidance for future judicial practices regarding AI-generated works. However, China’s copyright law has not made clear provisions on whether AI-generated images constitute works, and there is also no consensus on this issue within the academic community. Therefore, the outcome of this case has raised many doubts about the applicability and feasibility of copyright law. Based on this, to adapt to the development of AI technology, it is necessary for both the academic community and practitioners to further discuss and research the classification and copyrightability of AI-generated images. This could help clarify their legal status, thereby providing clear legal guidance for similar disputes.

2. Copyrightability of AI-Generated Images

The issue of copyrightability of AI-generated images is the premise and basis for determining the legal attributes of AI-generated images in copyright law.

2.1. The Need for Copyrightability of AI-Generated Images

If AI-generated images are not protected, many of them may enter the public domain, and everyone can use these images without permission. This may be a good thing for individuals, but it could be detrimental to society and related markets. However, the lack of copyright protection will dampen the enthusiasm of AI creators and image artists for developing and enhancing AI and creating images. Conversely, this could result in a proliferation of free or low-cost AI-generated images in the market, thus seriously distorting market competition and hindering the creative opportunities of authors who rely on creativity and innovation for their livelihood. At the same time, this may also lead to market saturation, reduce the demand for high-quality content, and thus affect the healthy development of the market. The reason why copyright law gives authors a period of monopoly rights is to protect the enthusiasm of authors for creation and encourage them to create more excellent works, so that the public can enjoy more high-quality literary and artistic works. This is the benign cycle of “creation-protection-incentive-recreation” that copyright law hopes to pursue [2]. For individuals, AI is still just a tool for their creation, so if AI-generated images are not protected, it will to some extent undermine this benign cycle and shake the foundation of copyright law. However, given the current situation of the use of AI in society, as well as the large number, variety, complexity, rapidity of creation, unpredictable results, and difficult-to-assess value of the generated works, it is urgently necessary to regulate them through law. Otherwise, it will not only harm the interests of relevant rights holders, dampen their enthusiasm for creation, but also cause the public to miss out on more excellent works.

2.2. The Intrinsic Mechanism of Attributes of the Work in AI-Generated Images

The generation of images using AI is based on neural networks, which can learn the process of image generation through extensive data training. In Generative Adversarial Networks (GANs), the generator network maps a random noise vector to generate realistic images. The core of GANs technology consists of two components: the generator and the discriminator [3]. The generator's task is to produce images that look real, while the discriminator's task is to distinguish between generated images and real images. During the training process, the generator aims to “deceive” the discriminator by producing images that are indistinguishable from real images, while the discriminator continuously learns to improve its ability to differentiate between generated and real images [4]. In this “game” process, the performance of the generator and discriminator will be continuously improved, thereby making AI-generated images more realistic. Furthermore, AI-generated images can also be produced using Convolutional Neural Networks (CNNs). CNNs can effectively process image data and learn spatial structure information from images. In image generation, CNNs can generate a realistic image based on input conditions. For example, in image style transfer, the input condition can be a reference image, and CNNs can apply the style of this image to another image, generating a new image with the style of the reference image. Whether it's financial articles automatically written by Tencent's robot Dreamwriter [5] or images generated in the “AI-generated image” case by Stable Diffusion [1], these generated entities appear to be “intellectual achievements”. In form, AI-generated entities are expressions of thoughts, emotions, or understandings that can be understood by humans, and they also demonstrate a certain degree of creative “intelligence” [6]. In practice, AI is applied to imitate human intellectual activities, so AI-generated entities, as knowledge products formed by imitating human intellectual activities, should be recognized as intellectual achievements in the sense of copyright law [7].

Nowadays, there has been an emergence of a large number of various AI-generated content on social media platforms, among which images generated by AI are almost indistinguishable from those created by humans in terms of form. This has had a significant impact on both the way images are created and their circulation in the market. Therefore, it is necessary to clarify the legal attributes of AI-generated images in copyright law. According to the definition of works in the copyright law, the characteristics of being “within the fields of literature, art, and science” and “capable of being expressed in a certain form” are relatively easy to satisfy. However, the most core and controversial

element is “originality”. Originality refers to being independently conceived by the author, and the content or form of the work is completely or substantially different from works already published by others, it is not a copy, plagiarism, or tampering of others’ works [8], and it can reflect the spatial aspect of intellectual creation. However, AI creation lacks the subject qualification in copyright law, and originality requires the manifestation of the spatial aspect of human intellectual creation. Therefore, it is insufficient to determine that AI-generated entities constitute works solely based on their originality, and further analysis and discussion on originality are needed.

3. Copyrightability Analysis of AI-Generated Images from the Perspective of Originality

3.1. The Theoretical Debate on Originality

Currently, there is a division in the theoretical circle regarding the attributes of work in AI-generated entities. Among them, there are proponents and opponents. Those who affirm argue that AI-generated entities meet the minimum requirement of creativity in external form and can constitute works in the sense of copyright law [9]. On the other hand, opponents provide arguments from different angles to demonstrate the non-work attributes of AI-generated entities: firstly, from the perspective of the creator, they advocate that natural human creation is a prerequisite and foundation for establishing works, and since AI is not a natural person, AI-generated entities cannot be recognized as works [10]. Secondly, from the perspective of the process of AI-generated entities, it is believed that AI-generated entities are the result of the application of algorithms, rules, and templates, exhibiting a high degree of homogeneity and leaving no room for creativity, thus failing to reflect the personalized characteristics of the creator. Therefore, they cannot meet the requirement of originality [11]. Thirdly, they question the intellectual and emotional significance brought by AI-generated entities as works, believing that they do not contribute to achieving the basic goals of the copyright system, and there is no reason to encourage them through copyright [12].

Analyzing the above two viewpoints, it is easy to find that they both regard originality as the key to determining whether AI-generated entities constitute works. The difference lies in the perspective from which the two viewpoints are analyzed. The opposing viewpoint takes a subjective perspective, considering natural human creation as a prerequisite and requiring the entity to reflect the individual creative contribution of humans, thus directly denying the possibility of AI-generated entities being recognized as works. Conversely, the affirming viewpoint takes an objective perspective, considering the entity itself to possess originality and thus capable of being recognized as a work.

3.2. Criteria for Determining the Copyrightability of AI-Generated Images from the Perspective of Originality

If an image is displayed independently without informing the creator, it may be recognized as a work if its appearance meets the requirements of originality. However, once the label indicating that the image was generated by AI is attached, there may be controversy over whether the image can still be recognized as a work. When discussing whether AI-generated images constitute works, it is not sufficient to only consider whether the images themselves possess originality; the core issue lies in the role of humans behind the generation of the images. Based on this, some scholars argue that the object of originality should be the work itself rather than the author. The determination of originality should be based on an objective assessment of the originality of the work itself, rather than from the perspective of the author’s identity. Otherwise, if AI lacks legal subject status, then the discussion loses its meaning [13]. Indeed, AI does not have legal subject status, but its creations should not be directly denied recognition as works. Currently, AI creation has gradually become a mainstream method of creation, and from the perspective of encouraging creation, the works generated by AI should also be protected by copyright law.

However, it is also necessary to judge subjectively whether humans have made a creative contribution during the process of AI creation. Since AI cannot create independently without human intervention, humans carefully select and edit the initial data, providing a starting point for the creativity of the generated entity to achieve the desired creative effect, thereby influencing the originality of the final entity. Therefore, it is necessary to comprehensively consider the interaction between AI and humans in the creative process to comprehensively evaluate the originality of the generated entity. At this stage, generative AI models do not have free will and are not legal subjects. Therefore, when people use AI models to generate images, there is no question of determining who the creator is between two subjects. Essentially, it is still humans using tools to create, humans, rather than AI models, invest intellectual efforts throughout the entire creative process. Encouraging creation is recognized as the core purpose of the copyright system. Only by correctly applying the copyright system and encouraging more people to create with the latest tools can it be more conducive to the creation of works and the development of AI technology. In this context and technological reality, AI-generated images, as long as they reflect the creative intellectual contribution of humans, should be recognized as works and protected by copyright law [1].

In summary, we believe that the judgment of whether AI-generated images constitute works should not be evaluated using subjective or objective standards, it is not appropriate to determine solely based on the creator of AI-generated images or their external appearance whether they constitute works. Instead, a comprehensive consideration should be given from a perspective that combines both subjectivity and objectivity, evaluating both the subjective contribution of humans in the creative process and the objective originality of the entity itself. If the significant creative contribution of humans during the AI creative process is evident, and the entity itself also possesses original characteristics, then even if the image is generated by AI, it should be recognized as a work.

4. Typological Analysis of AI-Generated Images Meeting the Requirements of Works

This paper discusses two common modes of AI-generated images: text-to-image and AI-based image enlargement. Due to significant differences in the creative process between these two modes, they will be discussed separately.

4.1. Text-to-Image as Works in the Sense of Copyright Law

Text-to-image creation is a typical collaborative process between humans and AI. In this process, the human-AI collaboration should be viewed as a whole. Therefore, the analysis of whether the generated entity constitutes a work should consider whether the information guiding AI creation, such as user prompts, reflects personalized thinking and judgment. The ultimate judgment of whether the generated entity constitutes a work depends on whether it embodies the user's original creative contribution. If only simple prompts, such as "a beautiful woman with black hair" or "a skyscraper by the sea", are provided, they cannot reflect personalized thinking and judgment. In this case, the product of AI's autonomous creation lacks unique personality and subjective characteristics, thus lacking originality. However, in the case of the "AI-generated image", the plaintiff designed elements of the image, such as characters and their presentation, through prompts, and set parameters for layout and composition, reflecting the plaintiff's choices and arrangements. Additionally, the plaintiff continuously adjusted and revised the parameters after obtaining the first image by adding prompts and modifying parameters, demonstrating aesthetic choices and personal judgment. Therefore, the resulting image possesses originality and qualifies as a work. Furthermore, from the judgment perspective, the court deemed the plaintiff directly responsible for configuring the AI model and ultimately selecting the image. The resulting image directly stemmed from the plaintiff's intellectual input and reflected the plaintiff's personalized expression, making the plaintiff the author of the image and entitled to its copyright.

Based on the above analysis, if the “text” in text-to-image creation can reflect a certain level of intellectual creativity from the user, then the generated image possesses originality, qualifies as a “work” in the legal sense, and is protected by copyright law. Therefore, users of AI can be recognized as authors.

4.2. AI-based Image Enlargement Should not Constitute Works in the Sense of Copyright Law

AI-based image enlargement is an intelligent recognition process based on AI algorithms. It enlarges the entire image proportionally, providing the original photo with a larger canvas and a broader perspective. The AI then predicts and supplements missing parts of the photo based on its context and texture. From the perspective of originality, firstly, the process of AI-based image enlargement resembles modifications to existing works. Whether from the subjective intentions of the AI user or the actual results generated, in most cases, the resulting images only modify or expand elements of the original photo’s scene or texture, without any objectively identifiable, significant differences from the original work. Therefore, they fail to create “new” works and do not meet the requirement of “originality”. Secondly, while text-to-image creation requires users to input prompts to generate images, AI-based image enlargement is much simpler, requiring only the importation of photos. The resulting images are purely the product of AI’s autonomous creation, with no user intervention in the creative process, and thus fail to reflect the user’s original creative contribution. From the results perspective, while users of text-to-image creation have certain expectations for the generated images, users of AI-based image enlargement cannot predict the results, as the generated images are random. Especially when elements in the original image are not fully represented, the results can be absurd and illogical. Such results also fail to meet the requirement of “creation”. Based on the above analysis, images expanded by AI lack originality and thus do not qualify as “works” in the sense of copyright law.

5. Conclusion

The core distinction of AI from other creative tools lies in its ability to autonomously learn. However, at the current level of technological development, AI cannot operate independently without human intervention. Therefore, fundamentally, AI remains a tool for human creativity. The key to determining whether AI-generated images constitute works lies in the degree of correlation between the user’s original creative contribution in the AI creation process and the originality of the AI-generated images. AI-generated images with a high degree of correlation are considered “works”, and their copyright should belong to the user. However, for “works” with weak original contributions from the user but with formal originality, even if they cannot be protected by copyright law at present, they should not be classified into the public domain. This is because the efficiency and quantity of AI creation surpass what humans can achieve, and AI-generated works entering the public domain would weaken human creativity and affect the healthy development of the market. Therefore, specific copyright ownership should be determined based on the substantial contributions of creators or investors.

The development of AI is an inevitable trend in social development, and the inability of AI to replace human intelligence is also inevitable. The immediate priority is still to seek ways to regulate the legal attributes of AI-generated entities. Copyright law should adapt to technological developments and balance the rights of creators with the societal demand for innovation. In the future, a legal system suitable for AI should be constructed. Only through adaptable and flexible legal systems can we effectively address the challenges posed by emerging technologies and propel society towards greater intelligence and innovation.

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