

Research on the Non Copyright and Copyright Infringement Regulations of Artificial Intelligence Painting

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Abstract: *Artificial intelligence has surpassed its instrumental role in content generation, playing the role of creators, and this is also true in the field of painting. With the maturation of artificial intelligence painting technology, the generated paintings are not only difficult to be protected by copyright, but there are also significant infringement risks that cannot be ignored in the process of obtaining and utilizing the works of others. Specifically, artificial intelligence painting lacks the rationality of obtaining copyright protection due to its characteristics of low originality, fragmented expression, and semi creation. This article takes the non copyright ability of artificial intelligence painting as the research core, and based on the analysis of the current research situation, elaborates on the issue of copyright infringement in artificial intelligence painting.*

Keywords: Artificial intelligence, Copyright, Copyright infringement.

1. The Representation and Characteristics of Artificial Intelligence Generated Paintings

In the field of creation, the development of artificial intelligence can be described as rapid progress. In the past, it was more like a pair of skilled human hands, serving as instrumental roles to assist us in completing artistic activities such as writing, painting, and composing music. However, with the rapid advancement of computer technology, artificial intelligence is now able to independently play the role of creators and generate stunning works, and even to some extent replace human mental labor [1]. Nowadays, paintings generated by artificial intelligence have been widely used in entertainment industries such as gaming and film, and the works they create are highly similar to human works, sometimes even exceeding human expectations. Therefore, analyzing the expression and characteristics of artificial intelligence generated paintings and exploring their copyright issues has become an urgent issue that needs to be addressed.

1.1 The Representation of Painting Generated by Artificial Intelligence

GAN (Generative Adversarial Network) is a popular artificial intelligence drawing method, which mainly improves the authenticity of generated data through adversarial training of generators and discriminators, and ultimately generates art works that are similar to real data [2]. Taking GAN as an example, artificial intelligence generates paintings mainly through the following aspects:

1.1.1 Wider creative scope

Artificial intelligence painting is no longer limited to traditional painting styles and themes, but can cover a wider range of creative categories. Whether it's landscapes, portraits, still life, or abstract art, artificial intelligence can generate works with unique charm by learning and analyzing a large amount of data.

For example, by training GAN models, artificial intelligence

can generate highly realistic landscape paintings. These paintings not only excel in color, light and shadow, and composition, but also capture subtle changes and details in natural landscapes. In addition, artificial intelligence can also generate painting works with different styles and themes based on user needs and preferences, greatly expanding the scope of painting creation.

1.1.2 Creating new artistic styles

Another prominent manifestation of artificial intelligence in painting creation is the creation of new artistic styles. Artificial intelligence can integrate and innovate various art styles by learning and analyzing them, generating new artistic styles.

Taking Deep Art as an example, this neural network-based artificial intelligence painting tool can convert images uploaded by users into various artistic styles. Whether it's the style of masters such as Van Gogh, Picasso, or Dali, Deep Art can be easily achieved. More importantly, artificial intelligence can also innovate on the basis of these styles, generating works that are both master like and full of novelty [3]. This innovative artistic style not only brings a brand new visual experience to the audience, but also provides artists with more possibilities and creative inspiration.

1.1.3 Automatic recognition and repair of artworks

In addition to creating new paintings, artificial intelligence can also play an important role in art recognition and restoration. Artificial intelligence can automatically recognize elements, styles, and features in painting works through image recognition technology [4], providing strong support for the identification and classification of artworks.

Meanwhile, artificial intelligence can also automatically repair damaged artworks. By analyzing information such as texture, color, and structure of artworks, artificial intelligence can predict and fill in missing parts, allowing damaged artworks to be restored to their original appearance. This

automatic restoration technology not only improves the efficiency and quality of art protection, but also makes important contributions to the protection and inheritance of cultural heritage.

1.2 The Characteristics of Artificial Intelligence Generating Paintings

1.2.1 Similar in appearance to paintings created by humans

If the content generated by artificial intelligence is placed in front of humans without special labeling, people often find it difficult to distinguish whether its content originates from human hands or machine intelligence. In other words, works created by artificial intelligence are highly similar in appearance to human works and difficult to recognize at a glance. For example, after the first appearance of the mascot of the the Year of the Loong Spring Festival Gala, "Long Chenchen", in 2024, a dispute about its authenticity has attracted widespread attention. Some netizens question whether this image was synthesized through artificial intelligence. Regarding these doubts, the official Spring Festival Gala responded promptly through Weibo, emphasizing that "Long Chenchen" was personally drawn by the design teacher one by one, rather than synthesized through artificial intelligence. It can be seen that the appearance of artificial intelligence painting is very similar to that of human created paintings. If not reminded, it is difficult to distinguish between the paintings generated by artificial intelligence and the actual paintings created by humans in terms of appearance.

1.2.2 Batch generation with high efficiency

With the development of artificial intelligence technology, some artificial intelligence painting platforms such as "Wenxin Yige" and "Inception Master" have been able to quickly generate high-quality artificial intelligence paintings through simple textual descriptions. Assuming a user wants to generate a landscape painting, they only need to input relevant descriptive text on the platform, choose their preferred style, and wait for a few seconds to minutes. The platform can then generate a painting that meets the requirements. The process of artificial intelligence generating paintings can be described as highly efficient, and users can almost immediately obtain the works they want.

Taking the famous painter Van Gogh as an example, human painting took several weeks to complete his representative work "Starry Sky". In this work, Van Gogh employs a large number of punchline techniques, and every stroke and dot embodies his hard work and thinking. Similarly, even for a skilled artist, creating a complex oil painting may take several days or even weeks, as they need to consider multiple factors such as composition, color, light and shadow that affect the performance of the painting.

Therefore, compared to human created paintings, artificial intelligence painting exhibits the characteristics of batch generation and high efficiency.

1.2.3 The human body details drawn are prone to errors

Due to the uneven distribution of training data and the complexity of limbs and hands, artificial intelligence painting is not perfect enough in the drawing of limbs and hands. This is mainly because the training of artificial intelligence models usually relies on a large number of datasets, and rich facial images are more conducive to data concentration, making artificial intelligence perform better in facial feature recognition and generation. Relatively speaking, data on limbs and hands is scarce and not comprehensive enough, which makes it difficult for the model to achieve the same accuracy and coordination as the face when generating these parts.

In addition, the shape and movement changes of the limbs and hands are very diverse, involving not only bone structure and muscle distribution, but also joint bending, flexible finger movements, and so on. These complex morphological changes are a huge challenge for artificial intelligence models, especially in the absence of sufficient training data, making it difficult for models to accurately capture these changes.

When we observe paintings generated by artificial intelligence, we may find that there are obvious human body detail errors such as "five fingers" and "four finger joints" in the hands of characters. Similarly, there may be disharmony in the length, thickness, and connection with the body of the limbs. These issues all indicate that artificial intelligence still has inevitable limitations when dealing with complex forms and movements of limbs or hands.

2. Controversy over the Copyright of Artificial Intelligence Generated Paintings

In the increasingly fierce competition in the field of global artificial intelligence, there is still controversy in the theoretical community about whether China's artificial intelligence creative achievements have copyright. If it can be confirmed that images generated by artificial intelligence enjoy work protection, this measure is expected to stimulate more social entities to adopt artificial intelligence technology to create images and other art works, thereby promoting entrepreneurial vitality in various sub fields of artificial intelligence. On the contrary, if artworks generated by artificial intelligence cannot obtain the same legal status as other works in China, although it will bring serious challenges to the survival environment of artificial intelligence entrepreneurial teams, on the other hand, it will also greatly protect the rights of the original copyright holders in the artificial intelligence model database and avoid the abuse of artificial intelligence technology.

2.1 The Qualitative Differences of Artificial Intelligence Generating Painting Copyright in Judicial Practice

In November 2023, the Beijing Internet Court made a first instance judgment on the copyright infringement dispute between Li and Liu.[5] The plaintiff Li used artificial intelligence to generate images related to the case and published them on the Xiaohongshu platform; The defendant Liu is a blogger from Baijiahao who used the same image in his article, and the plaintiff filed a lawsuit. After hearing, the Beijing Internet Court held that: from the whole process of conceiving the pictures involved in the case to the final

selection of the pictures involved in the case, the plaintiff has made certain intellectual investment, such as designing the presentation of characters, selecting prompt words, arranging the order of prompt words, setting relevant parameters, and selecting which picture meets the expectations. Therefore, the pictures involved in the case generated by AI have the requirements of "intellectual achievements" and "originality", and the pictures involved in the case should be recognized as works of art. The plaintiff, as the author of the involved images, enjoys copyright and should be protected by the Copyright Law.

In February 2024, the Guangzhou Internet Court made a first instance judgment on the copyright infringement dispute between Shanghai Xinchuanhua Cultural Development Co., Ltd. and an AI company [6]. When claiming their rights, the plaintiff not only listed in detail the core features of Ultraman's works presented in the form of text descriptions and image displays, but also submitted relevant screenshots of Ultraman's images generated through artificial intelligence technology on the defendant's operating website as evidence. After the court's trial, it was found that the defendant violated the plaintiff's right to copy and adapt the Ultraman works involved in the case while providing generative artificial intelligence services, and should bear relevant civil liability. The defendant was ordered to immediately stop infringing on the plaintiff's Ultraman works copyright and compensate the plaintiff with reasonable expenses for economic losses of 10000 yuan. This case has become the first effective judgment of generative AI services infringing on the copyright of others worldwide, and is praised by the media as the "first global AIGC platform infringement case".

2.2 Discussion on the Copyright of Artificial Intelligence Generated Paintings in the Academic Community

In February 2023, the US Copyright Office officially made a decision to revoke the copyright registration of the manga "Zaria at Dawn". The copyright applicant of this comic, Kashtanova, generated a series of images based on its storyline using the AI drawing tool Midjourney. Originally, the US Copyright Office registered this comic as a work of art, but later revoked the registration upon learning that these images were generated through AI technology. The US Copyright Office further clarifies that the storytelling of comics can be protected by written works, while complete works composed of storytelling and visual elements can be protected as compilation works. However, individual comic images cannot be classified as protected works of art.

Professor Jiang Ge has put forward a completely opposite view on the approach of the US Copyright Office. Professor Jiang Ge believes that when evaluating the copyright registration application for Space Opera House, the US Copyright Office focuses more on analyzing creative tools rather than the roles and contributions of creators, which to some extent ignores human subjectivity and creativity. Although AI tools have significant capabilities in information processing, they are not enough to replace the originality of users. The contribution of AI drawing tools like Midjourney is mainly reflected in the process of converting visual noise into images driven by algorithms and parameters, while the contribution of users lies in their carefully combined prompt

words, selected models, and set parameters. These two contributions are intertwined and together shape the ultimate result of AI painting [7]. Therefore, Professor Jiang Ge advocates recognizing the copyrightability of AI generated paintings from the perspective of user originality in AI generated paintings.

3. Artificial Intelligence Generated Paintings do not have Copyrightability

Due to the current lack of subject qualifications for artificial intelligence, in order to ensure copyright protection for the generated paintings, it is not only necessary to consider the issue of ownership of rights, but also the creative process and objects. Moreover, the generated painting activities of artificial intelligence actually focus on simulating and reproducing the works of others. At the current stage of development, this kind of "creation" mainly relies on imitation, rather than the autonomous consciousness or independent thinking ability possessed by artificial intelligence itself. The essence of literary works lies in their creativity, while the content generated by artificial intelligence through deep learning of natural human works, although similar in appearance to human works, fundamentally deviates from creativity.

3.1 The Non Copyrightability of "Low Originality" Artificial Intelligence Painting

Originality, as a fundamental attribute of copyrighted works, requires that the work must originate from the author's independent creation and reflect a certain degree of innovation or novelty. In the "Intellectual Property Law Tutorial", Professor Wang Qian conducted an in-depth analysis of the concept of "originality", emphasizing the different connotations of "originality" and "creativity", and pointing out that works must meet the dual standards of "quantity" and "quality" at the same time. Firstly, when it comes to "independence", the core lies in "independence and originality", that is, the intellectual labor achievements must come from the author's own hands, not from plagiarism, and must be independently completed by the author. This level focuses on the existence of the work, that is, the definition of "existence and non existence", with a focus on the consideration of "quantity". Secondly, regarding "creativity", it requires that the results of labor must possess a certain level of "intellectual creativity", which reflects the author's unique insights, personal expression, and basic creative level. This is a requirement for the quality of the work, that is, a measurement of "high and low", focusing on the evaluation of "quality".

The Supreme People's Court also clearly pointed out that the Copyright Law protects works with originality and must meet both the conditions of "independent creation" and "minimum creativity" in order to become works within the meaning of the Copyright Law. Works protected by the Copyright Law not only require independent completion, but also a certain level of intellectual creativity. Intellectual creativity can reflect the author's unique intellectual judgment and selection, showcase the author's personality, and meet certain creative height requirements. Both "uniqueness" and "creativity" are indispensable.

Although artificial intelligence is the crystallization of human intelligence, its algorithm model is deeply rooted in programs. Since humans need to use the data resources possessed by artificial intelligence to complete their works, it is difficult to abandon the help of artificial intelligence algorithms. Focusing on "creativity" in "originality", humans can demonstrate a certain degree of "intellectual creativity" and express their unique insights in artificial intelligence when generating paintings through algorithm design and parameter adjustment. However, the "originality" in "originality" requires that the intellectual labor results must be independently completed by the author, and artificial intelligence data resources are stored in a large number of original painting works as models. These works inevitably have the risk of being imitated and used in the process of artificial intelligence creation, which leads to lower originality of artificial intelligence generated painting works.

Compared with traditional creative activities, paintings generated by artificial intelligence exhibit unique characteristics. These "paintings" are generated through processes such as selection, arrangement, analysis, and combination, which are entirely independently completed by artificial intelligence, making it difficult for humans to accurately control their output results. Although artificial intelligence programs reflect the user's creative intentions in system design, material selection, and organization, it is difficult to determine whether their final external form has complete originality. Therefore, painting works generated by artificial intelligence lack autonomy to a certain extent, making it difficult to fully meet the requirements of copyright for "originality", and can be regarded as a form of "low originality" expression.

Given the current development stage of artificial intelligence technology and its output mechanism for generating paintings, we recognize that artificial intelligence does not yet possess human creative thinking, and its "creative" activities exhibit more mechanical and algorithmic characteristics. This makes it difficult for artificial intelligence painting to have uniqueness and uniqueness in its formal expression, with more emphasis on identity and homogeneity. In some cases, it cannot meet the independent creation or innovation standards required for originality.

Therefore, based on the criterion of originality, artificial intelligence painting reflects "low originality". Although not completely copied or equivalent to the creativity of others, it should still not be included in the scope of copyright protection.

3.2 The Non Copyright of Artificial Intelligence Paintings for "Half Life Objects" and "Fragmented Expressions"

The type of work is determined by its form of expression and the perceived effect of the reader, therefore, the form of expression plays an important normative role in establishing the attributes of the work. Looking at the current creative reality of artificial intelligence, we can find that although they embody human wisdom and creative intentions, they are not directly recognized by humans. In the field of artificial intelligence painting, not all works can present recognizable content. Some works are quite complete in form and can fit

the expression of human works, thus being recognized by readers. However, there are also some works that are only in a "semi generative" state, and their expression methods do not conform to the conventional form of the works, and may even be meaningless "fragmented" expressions, lacking completeness and logical connections. This type of work, we refer to it as "half life objects" or fragmented expressions, as it cannot be directly perceived by the public and therefore does not meet the conditions for copyrightability.

"Half life object" refers to the ability of artificial intelligence painting works to not only rely on algorithms and technology to extract materials from databases and generate them automatically, but also incorporate the creativity and intervention of human artists. It is a unique hybrid creation method between humans and artificial intelligence. This hybrid creative approach not only endows artificial intelligence painting works with the technical precision they already possess, but also adds human specific artistic emotions and personalized features to the works. Therefore, paintings generated using artificial intelligence are referred to as "half life objects".

"Fragmented expression" literally refers to breaking down originally complete or continuous elements into multiple independent parts, and then recombining and creating these parts. From the perspective of the creative process of artificial intelligence paintings, AI systems first analyze and recognize complex elements such as images, colors, and lines, and then break them down into multiple fragmented components. Next, these fragmented elements will be recombined and recreated based on the algorithms and rules built into the AI system, resulting in unique visual effects in the artwork. However, it is precisely due to the characteristic of "fragmented expression" in artificial intelligence painting that there may occasionally be errors that do not conform to human cognition when generating drawings with details. For example, when drawing a human body, there may be extreme inconsistencies in the length, thickness, and connection between the limbs and the body.

These contents may be embedded in artificial intelligence programs in code form or cannot be directly recognized by humans. Given the existence of such situations, it is clearly inappropriate to explore the copyrightability of artificial intelligence paintings without distinction, as this may lead to confusion in the categories of works in copyright law. When discussing the copyrightability of artificial intelligence painting, we must fully consider the relationship between its form of expression and the reader's perceived effect. Given the characteristics of artificial intelligence painting as a "half life object" and "fragmented expression", it remains to be debated whether artificial intelligence painting can be included in the scope of copyright protection. In the author's opinion, artificial intelligence painting should not be included in the scope of copyright protection.

4. The Regulatory Approach for Artificial Intelligence Generated Painting Copyright Infringement

The non copyrightability of artificial intelligence painting makes it difficult to protect the copyright of works that are

included in artificial intelligence training data without authorization. For the determination of copyright infringement, the principle of "contact and substantive similarity" is usually adopted as the universal standard. However, determining whether there is a "substantial similarity" in the judgment principle of infringing works is of utmost importance in determining cases of copyright infringement disputes over traditional art works. The application of this principle in artificial intelligence generated object infringement disputes highlights the complexity of determining infringement behavior. At present, due to the fact that artificial intelligence itself does not have the qualification of a legal entity, and the difficulty of copyright infringement litigation in art creation, only by clarifying the regulatory channels for artificial intelligence to generate painting copyright infringement can we continue to enhance the enthusiasm of creators and promote the healthy development of the creative field.

4.1 Prioritize Obtaining Authorization from the Copyright Owner before Use

In response to the potential copyright infringement risks that artificial intelligence painting may face during the data collection stage, AI operators should actively explore and adopt legal ways to obtain data within the existing legal framework, in order to effectively avoid the infringement problems caused by unauthorized use of their works without the permission of the copyright owner. Specifically, artificial intelligence painting can be roughly divided into two categories.

One type is artificial intelligence, which is relatively simple in programming and mainly used to generate ordinary drawings. Its output is often limited to personal use and the precision is not enough to meet commercial needs. For this type of artificial intelligence painting, the operator can pay the corresponding remuneration to the copyright owner, which is to use platform signing to attract more qualified and capable artists to join the platform. This mechanism not only helps to protect the economic rights and interests of copyright holders, but also encourages them to actively upload their personal works to the artificial intelligence painting database, thereby enriching data resources.

Another type of artificial intelligence painting can create high-quality works, suitable for game scenes, various clothing and jewelry designs, as well as more commercialized and specialized animation films. For artificial intelligence painting with more advanced technologies, operators should establish more rigorous and detailed authorization and licensing mechanisms. They should establish a communication platform to facilitate direct communication between users and copyright owners, ensuring that both parties can negotiate independently. If users and platforms can pay certain remuneration for artificial intelligence paintings with higher commercial value, it can to some extent protect the rights of copyright holders and make the use of artificial intelligence paintings more standardized and professional [8].

Through clear classification and targeted licensing mechanisms, artificial intelligence operators can avoid the

risk of copyright infringement while establishing a relatively stable cooperative relationship with copyright owners, jointly promoting the healthy and orderly development of artificial intelligence painting technology.

4.2 We Should Encourage the Infringed Party to Engage in Collective Litigation

Once artificial intelligence painting infringement occurs, it is difficult to only involve the work of one copyright owner, and often it will affect many copyright owners. In this context, if the infringed copyright owners choose to initiate a lawsuit together to defend their legitimate rights and interests, this will bring multiple benefits: on the one hand, class action litigation can gather the demands of the infringed parties, comprehensively protect the rights and interests of all relevant parties, thus facilitating the centralized organization of litigation materials and constructing a complete and powerful evidence chain; On the other hand, through collective litigation, the infringed party can not only reduce individual litigation costs, but also contribute to the improvement of judicial efficiency, highlighting the significant advantages of collective litigation in responding to artificial intelligence painting infringement lawsuits [9].

While copyright owners actively use legal means to jointly defend their own rights, other relevant departments should also adopt professional and logical strategies to effectively prevent the occurrence of artificial intelligence painting infringement. Specifically, relevant departments can strengthen technical supervision to ensure that artificial intelligence paintings comply with copyright regulations during data collection and use; Strengthen publicity and education to raise public awareness and awareness of the issue of artificial intelligence painting infringement. The model of mutual efforts between the infringer and relevant departments can not only better protect the legitimate rights and interests of copyright owners, but also further promote the healthy and orderly development of copyright protection environment, providing strong support for the sustainable development of artificial intelligence painting technology.

4.3 Optimizing the Method of Determining Infringement in Artificial Intelligence Painting

Scholars have proposed that the establishment of the "substantial similarity" rule aims to prevent the abuse of public access rights in intellectual property law [10]. When determining "substantial similarity", the holistic observation method and the abstract separation method are the two main methods, among which the abstract separation method is more commonly used in actual infringement determination. However, with the continuous enrichment of creative forms in works, non original expressions are becoming increasingly difficult to eliminate in works, which to some extent increases the complexity of judgment. The random collection of big data in the creative process of artificial intelligence painting indirectly makes it difficult to effectively apply the abstract separation method in practice. Therefore, using the holistic observation method to determine the copyright infringement issue of artificial intelligence painting is more appropriate than directly using the abstract separation method [11].

In addition, due to the dependence of artificial intelligence painting processes on complex calculations, the content of copyrights often presents discrete features. It can be seen that there are indeed problems in judging the intellectual property infringement of Chinese painting based on the "substantial similarity" standard used in Chinese natural person works. Therefore, in judicial practice, the determination of whether artificial intelligence generated products constitute infringement should be moderately optimized on the basis of traditional judgment criteria to conform to the trend of technological development in the new era.

5. Conclusion

The rise of artificial intelligence painting technology has provided unprecedented creative opportunities for the public. Its low threshold operation and high-level output make art creation no longer exclusive to a few people. The combination of technology and art has given rise to new forms of artistic expression, injecting new vitality into the field of artistic creation. However, due to its low originality, semi creation, and fragmented expression, artificial intelligence painting is difficult to be protected by copyright, and the widespread application of artificial intelligence painting must not be at the cost of infringing on the legitimate rights and interests of copyright holders. Therefore, relevant departments should actively pay attention to and solve the possible infringement issues caused by artificial intelligence painting, protect the rights and interests of copyright holders through effective measures, and strive to promote the healthy development of the entire creative field while stimulating creative enthusiasm.

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