The Dilemma of Fair Use of Artificial Intelligence Painting and Its Regulations

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Abstract. At present, artificial intelligence painting technology is in an era of prosperity and development. The "transformation" of artificial intelligence painting works has brought challenges to the traditional fair use system, and characterization as fair use may lead to an imbalance of interests. It is necessary to re-examine the rationality of qualifying the use of artificial intelligence paintings as fair use. At the same time, analyze the infringement risk in the painting process in combination with the painting principles of artificial intelligence, and put forward some regulatory suggestions.

1 Introduction

In January, three artists filed a lawsuit against StableDiffusion and Midjourney's creators, Stability AI and Midjourney, and Dream Up's artist portfolio platform DeviantArt, accusing the platform of training AI models with 5 billion images scraped from the web without the authors' consent. The technology behind AI-assisted painting has been developed for many years and has been subject to copyright infringement controversy since its birth, because AI painting simulates and interprets the human painting process by learning a large amount of data in the database, and it is inevitable to use other people's works. The use of other people's works by AI paintings may constitute infringement of others' copyrights. The use of other people's works by artificial intelligence painting may constitute an infringement of other people's copyrights. At present, the discussion of the use of other people's works by artificial intelligence paintings in the field of copyright law mainly focuses on whether it constitutes fair use, and if the company is accused of infringement, whether it can invoke the fair use system for defense. At present, artificial intelligence painting technology is in an era of prosperity and development, and the "transformation" of works using artificial intelligence has brought challenges to the traditional fair use system. Overemphasizing its "transformative nature", and correspondingly underestimating its market consequences, may lead to an imbalance of interests, so the rationale of qualifying it as fair use remains to be explored.

2 Is it fair use for artificial intelligence to use other people's works

The acquisition and use of data is the basis of AI "creation". The mainstream training algorithm for AI painting today is centered on deep learning, which requires massive amounts of data as the "nutrients" for AI learning and growth. For example, a French R & D team used generative adversarial network (GAN) AI algorithm for painting "creation", the team inputted 15,000 portraits from the 14th century to the 20th century into the system, and "created" a series of portrait paintings through training. The team fed the system 15,000 portraits from the 14th to 20th centuries, and through training "created" a series of portrait paintings; the domestic AI robot Microsoft Ice took 22 months to "learn" the paintings of 236 masters in art history over 400 years.

Artificial intelligence "creation" must learn a large amount of relevant knowledge in order to organize, reason and generate the final input results. The European Union, Japan, etc. recognized the above challenges and adopted new legislation to add "limitations and exceptions to data mining" for AI[1]. The United States has opened up space for AI development through court interpretations of fair use in copyright law[2]. Regarding the use of others' works by AI creations, domestic scholars believe that a balance between copyright owners and technological progress can be achieved by incorporating fair use[3]. Fair use under the Copyright Law refers to the use of other people's works without payment under certain circumstances. Artificial intelligence "creation" inevitably needs to learn a large amount of correlative knowledge in order to organize, reason and generate the final input results. In order to promote the benign development of AI creation, the process of AI creation can be included in the scope of fair use under copyright law. Contrary to this, some scholars also believe that fair use should not be allowed to become a license for expressive AI plagiarism, and that including AI's use of works in fair use will make copyright interests unbalanced[4]. Other scholars believe that although the use of works by AI creations should be fully included in fair use with caution, the act of acquiring and using works for

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non-commercial purposes, such as the act of acquiring and using works for the purpose of researching or developing machine learning technology, can be considered as fair use[5].

However, the act of acquiring and using a work for commercial purposes to train machine learning models needs to be excluded from the scope of fair use. There is also a step-by-step analysis of whether each stage constitutes fair use from breaking down the steps of machine learning[6]. The input stage of machine deep learning using others' data, copying others' copyrighted public works into the AI database, combined with its subsequent behavior, can be used to constitute fair use according to the provisions of Article 24 of the Copyright Law. That is, for the purpose of personal study, research or appreciation, the use of another person's published work may be made without the permission of the copyright owner and without payment of remuneration to him/her, but the name or title of the author or the title of the work shall be specified and shall not affect the normal use of the work, nor shall it reasonably impair the legitimate rights and interests of the copyright owner.

China's copyright fair use is a closed provision, and only in accordance with the provisions of the law does it constitute fair use. The reason why personal study and research appreciation becomes fair use is that personal study and research is not for commercial purposes and is private in nature. The original purpose of the provision is to encourage personal study and prevent the abuse of the copyright owner's rights to the detriment of the freedom of others to study, enjoy and create. It is not possible to require everyone to seek permission to pay for the use of others' works, which would affect the dissemination and utilization of the works, but rather be detrimental to the development of the creative activity itself. However, most of the AI companies are companies with certain capital and technical conditions, and do not meet the main requirements.

At present, the AI painting software on the market mainly adopts the model of paying for membership, and some software will contain advertisements for cash even if it is free. Its capture of massive data for training AI painting models is obviously for commercial purposes, and is not private, which does not meet the original purpose of promoting individual creative activities. Secondly, there is a risk that the use of other people's works in AI painting will affect the potential market and value of the original work. Artificial intelligence painting model has become more and more perfect, for example, game design workers in the early stage of the project to organize ideas and the general style tone, can be painted by AI, a one-time batch rendering of hundreds of different images with the same elements of style, while in the early stage of the project where the color, style, composition and other basic elements are not determined, relying on people is unable to complete this volume of trial and error. Artificial intelligence, however, can do this easily. Artificial intelligence painting is efficient and low cost, and a large amount of rough and trivial work at the beginning of the project can be done by AI, and potential customers in the market will inevitably flow to AI, affecting the market value of similar painting works. Compared with AI companies, copyright owners are in a relatively weak position, and considering AI as fair use will only give AI companies a pass for reasonable infringement, abusing technical advantages to grab a large number of others' works already published on the Internet platform without bearing any responsibility.

3 The principle of artificial intelligence painting technology

A drawing is the result of human visual art expression, it is not just the result of the creator's own imagination full of imagination, it can also be used with rational thinking to have a regular perception of it, as well as its programmed practice. This lays a solid foundation for the drawing to be programmed. This is because the object of drawing, that is, everything in the objective world, corresponds to people's consciousness with symbols such as lines, colors, light and shadows, which are the basic substances that make up consciousness and can be defined and expressed formally with computer codes. JasonAllen, the author of Space Opera, completed the series by inputting key words about the subject matter, light, scene, angle, atmosphere, etc., and making repeated adjustments and modifications, finally selecting three of his most satisfying works from over 900 generated images for further rendering, and finally using Photoshop to manually retouch the images. The "Space Opera" series of digital artworks. So how does the computer understand the keywords entered? This involves a very popular branch of artificial intelligence: the use of neural networks to create artistic images. The mainstream techniques are machine learning algorithms, neural style migration, etc.

Machine learning mimics human learning methods by regressing and classifying training data to continuously optimize existing models and programs, which can eventually handle real-time situations automatically. Artificial intelligence for painting in recent years has been basically built on the basis of neural networks, mainly thanks to significant advances in machine learning and especially deep learning techniques. The biggest difference between deep learning and existing methods is the ability to automate the learning of data features. A large amount of data is learned, from which it is automatically identified. In deep learning, multi-layer neural networks are used to express data features hierarchically. In the case of a face image, for example, the "face" is composed of concepts such as "eyes" and "nose", and "eyes" and "nose" are further composed of "eyes" and "nose". "nose" is further composed of lower-level concepts such as "points" and "lines". By expressing features in a hierarchical manner, a wide variety of data can be expressed in a more flexible manner. The model architecture of deep learning has become more complex and the computational effort and learning time has increased significantly. Neural style migration algorithm is to apply the style of one image to the content of another image. Style in this context refers to the texture, color and other visual patterns in an image, while content is the higher-level macro-structure of the image. The result is a combined image

that contains both the content of a content image and the style of a style image. For example, using neural style migration algorithms it is possible to have any painting combined with Van Gogh's style to form a new work. Although a variety of specific algorithms for painting AI have emerged and are numerous, they have in common the construction of specific models for feature extraction, data processing, and image generation of painting objects.

4 Risk of infringement of artificial intelligence drawing

4.1 Ingest existing copyright-protected pictures into the artificial intelligence database

Before artificial intelligence can carry out in-depth autonomous learning, it is necessary to digitize the works as "creative" materials and convert them into standard data formats suitable for "machine reading". This operation is carried out on existing works without changing the content. copy and reproduce in full. If artificial intelligence developers digitize other people's works without the consent of others, or avoid the technical measures of the website to obtain works and store them on their own servers for use by algorithms and models, there is a risk of infringing the right of reproduction of others.There is a view that reproduction and imitation at this stage constitute a temporary reproduction of a work by a computer, and since China's Copyright Law does not provide for temporary reproduction, it is not infringement, but temporary copying must be short-lived and temporary, and cannot have economic purposes[7]. The behavior of artificial intelligence is not for network transmission between third parties, so it is difficult to use temporary copying to defend.

4.2 Embody protected elements of existing images in AI-generated paintings

In the output link, if the artificial intelligence only mechanically copies, stitches and combines other people's art, photography or graphic works during the creation process, this kind of patchwork lacks originality, and it should be determined to infringe its right of reproduction. For situations where a judgment of "substantial similarity" is required instead of mechanical reproduction, the "relevant public" with a certain ability to appreciate art should be clearly determined as the subject of judgment. The relevant public should adopt the partial comparison method to determine whether the AI's painting constitutes substantial similarity with a certain work, while the overall perception method should be adopted to determine whether it constitutes substantial similarity with multiple works. We can also use computer technology to decompose the AI painting and the work to be compared into pixels, and observe the similarities and differences between them as a reference factor to determine whether they constitute substantial similarity. If the final output of the AI is substantially similar to the data work previously used, the reproduction right may also be infringed.

As far as the right of adaptation is concerned, if the result of "creation" is a new work formed on the basis of retaining the basic expression of the original work, it is an act of adaptation and there is a risk of infringing the right of adaptation. For example, using the neural style transfer algorithm to apply the texture, color, and style of Van Gogh's paintings to his works without the permission of the copyright owner,which should be an infringement of its adaptation rights. There is a view that artificial intelligence does not have the subjective meaning of adaptation, which does not constitute an infringement of the right of adaptation[8]. However, even if the AI itself does not have the subjective intention to adapt, there are cases where its output does not constitute substantial similarity but can be seen to use some expressions of the copyright owner's work. If this does not constitute an infringement of the right of adaptation, it is difficult to protect the rights of the copyright owner.

5 Risk regulation of artificial intelligence painting infringement

5.1 Incorporate statutory license

There are tens of thousands of copy-righted works used by artificial intelligence paintings, and enterprises will be overwhelmed if they need to license them one by one. However, the gratuitous nature of fair use does not allow copyright owners to get the benefit they deserve, and it is also easy to be abused by enterprises with technical superiority, which instead harms the interests of copyright owners. If it saps the enthusiasm of copyright owners to create works and makes the total number of works in the market decrease significantly, it is ultimately not conducive to artificial intelligence to learn to create paintings. Statutory licenses can alleviate this tension within the statutory framework by ensuring that uses that legislators believe are both in the public interest and free from disputes over writings should be compensated to copyright owners[9]. Artificial intelligence enterprises with filed licenses can use others' works without the permission of copyright owners but should give reasonable compensation. Using the existing statutory licensing framework, a balance between the interests of work protection and technological development can be achieved. From the viewpoint of legislative technology, it can also save the legislative cost.

From a jurisprudential point of view, both statutory licenses and fair use are balancing systems that limit copyright rights. The difference between the two is that in the case of a statutory license the user of the work needs to pay the copyright holder. Although statutory licenses can bring reasonable compensation to right holders, as mentioned earlier, the data of works used by AI companies to train their algorithms is huge, and the original materials are often scattered across various online platforms. It is also very difficult for right holders to keep track of the use of their works, as the path of machine learning to obtain works is usually very difficult to track, and the process of "feeding" works to AI is also very covert. If statutory licenses are adopted for regulation, the actual application

process will need to be supported by the development of mature blockchain technology.

5.2 Collective management of copyright

In the digital age, the collective man-agement of copyright presents a special characteristic that the identities of the network service provider and the collective management organization overlap. The network service platform, that is, the collective management organiza-tion, can take advantage of the existing data resources to establish a digital work library. Enterprises need to pay fees to use the resources of the work library, but they should set up strict technical measures to prevent works from being leaked. In this way, the copyright owner can obtain economic returns, avoid the risk of infringement of artificial intelligence enterprises, and ensure the smooth operation of the artificial intelligence industry. The collective management system is essentially a way for users to access copyright-protected works from an authoritative and neutral organization other than the right holder. The aim is to reduce the cost of retrieving the work, the transaction costs for both parties and the associated legal risks. This system can be found in the French Intellectual Property Code, which addresses the issue of access to out-of-print books. In terms of implementation, the French Authors' Interest Association (AFI) acts as a specialized collective management organization, which grants licenses for digitized out-of-print works as well as for making them available to the public on the Internet. Compared to the statutory licensing system, the French col-lective management system is a better alternative for protecting the interests of authors and right holders by providing two types of opt-out mechanisms for right holders, one for prior and the other for subsequent declarations of opt-out.

Article 9 of China's Regulations on the Protection of the Right to Infor-mation Network Dissemination pro-vides similarities with the collective management system, allowing Internet service providers to make available to the public in rural areas, through the information network, works of public interest, basic cultural needs and other aspects. It also sets up a similar ex ante and ex post withdrawal mechanism, leaving room for right holders to freely deal with their exclusive rights. China's future legislation may consider, on this basis, designating authors' rights associations in the fields of writing, audio-visual, film and television, and fine arts as collective management organizations, listing relevant works in specific databases for access, replacing the rights holders in granting licenses for the use of works to AI machine learning, and gradually establishing a mechanism for paying for the use of AI works.

Under the collective Under the col-lective management system model, the collective management organization usually determines the transaction price on the basis of the licensing standard, or negotiates the price on the basis of the licensing standard[10]. However, the licensing standards are not compatible with the need for flexible pricing of works in the copyright market. At present, they have not been widely recognized by right holders, users and other relevant subjects. The implementation of the collective management system is not satisfactory. Therefore, in estab-lishing and improving the collective management system, on the one hand, the interests of all parties involved in the collective management system should be clarified, allowing rights holders and users to negotiate on an equal footing and to determine the fee rates in accordance with the actual market situation; on the other hand, the transparency of the collective management organization and the mechanism for distributing licensing fees should be improved, so as to fully safeguard the lawful interests of the authors and rights holders.

5.3 Constructing normative standards for artificial intelligence painting

Developers are generally the biggest beneficiaries of the AI's ability to draw and display its drawings to the public. Developers can first obtain copyright protection for their intelligent software. Even if the AI is based on an open source framework for drawing, developers can still use it to capture customers, applications and data resources, and gradually establish a new industrial landscape and technical standards. Therefore, based on the principle of aligning benefit with risk, developers of AI should be primarily responsible for copyright infringement of AI. Technically speaking, developers are also the subjects with the most say and control over AI. Firstly, developers shall not intentionally instruct AI to engage in copyright infringement through algo-rithms.

Second, developers should continuously enhance the transparency, interpretability, reliability and controllability of AI. Due to the concealment of the artificial intelligence algorithm itself, it is difficult to trace how many works are used and borrowed by artificial intelligence in the painting process, and the industry norms should be improved. The European Union's proposal to "Develop Uniform Rules on Artificial Intelligence <Artificial Intelligence Law> and Amend Certain Joint Legislative Acts" proposes that the EU will establish an independent database of high-risk artificial intelligence systems, the provider or authorized representative shall register in the database. For artificial intelligence technology, establish an algorithm review mechanism. By actively recording and disclosing the creation process, filing, publicity and other procedures, all aspects of the artificial intelligence painting process become transparent.

Finally, in addition to immediately stopping the infringing behaviour of the AI, the developer should also promptly fix the algorithmic vulnerabilities of the AI. If the algorithmic loopholes cannot be patched properly, the release of the AI should be temporarily or even permanently suspended.

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