The Determination of Copyright Infringement Offences in the Artificial Intelligence Arena from a Criminal-Civilian Intersection Perspective

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Abstract: The protection of copyright should adhere to the position that civil and criminal law are consistent, and that the same act cannot establish an offence of copyright infringement under criminal law to the extent permitted by civil law. It is appropriate to interpret the term "reproduction and distribution" in the context of the offence of copyright infringement as reproduction, distribution, reproduction and distribution. Judicial practice survey proved that at this stage, artificial intelligence can only be used as a tool for the offence of copyright infringement, and cannot become the subject of this offence, without affecting the construction and determination of this offence. As the object of the offence of copyright infringement, when an AI-generated object satisfies the two elements of originality and intellectual achievement, it can be considered to be a work of authorship and be included in the scope of protection under the Copyright Law and the Criminal Law. The legal interests protected by the offence of copyright infringement are firstly the state's order of copyright administration and the economic order of the socialist market, behind which lies the implication of protecting the copyright owner's advantageous position in market competition. With regard to the attribution of copyright in AI works, the determination can be made by drawing on the binary subject structure that has matured and operated in copyright law.
***Keywords*:** Artificial Intelligence; Copyright; Copyright Infringement Offence; Criminal-Civil Intersection; Civil-Criminal Consistency

1. Introduction

Social sciences will continue to evolve along with the development of natural sciences, and at a time when artificial intelligence and related technologies are developing rapidly, the crime of copyright infringement is gradually taking on new connotations and extensions. In order to clarify the offence of copyright infringement in the field of artificial intelligence, we should first clarify the various issues facing this offence, for example, is there any conflict or contradiction in the protection of copyright in the field of civil and criminal law? Is the legal interest protected by the offence of copyright infringement the private right of the copyright owner or the socialist market economic order? How to understand 'reproduction and distribution' under this offence? ..... At the same time, artificial intelligence also poses new challenges to the crime of copyright infringement: firstly, at this stage, can artificial intelligence become the subject of this crime or can it only exist as a criminal tool? If it can become the eligible subject of this crime, how to regulate its criminal behaviour; if it can only exist as a criminal tool, will it affect the construction and determination of the crime of copyright infringement? Secondly, if AI-generated objects may become the objects of this offence, how to include them into the scope of protection of copyright law and criminal law? How to determine the attribution of its copyright? This series of questions all affect the construction and improvement of the offence of copyright infringement in the era of artificial intelligence.

2. Consistency between civil and criminal copyright protection

The types of works protected by the Copyright Act and the Criminal Code are apparently the same and will not be discussed here, but only the purpose of their normative protection in the field of copyright. According to the theory of the purpose of normative protection, the purpose of normative protection in the field of copyright in criminal law and civil law may be the same as a whole, or it may be different. [1]

From the perspective of rights protection, the Copyright Law stipulates that its primary legislative purpose is to 'protect the copyright of authors of literary, artistic and scientific works, as well as rights and interests related to copyright', from which it can be seen that the relevant provisions in the Copyright Law are mainly for the protection of the copyrights of the rights holders, the neighbouring rights of the authors, as well as the other personal and property interests. other personal and property interests. Article 217 of the Criminal Law stipulates the crime of 'infringement of copyright', which belongs to Chapter III of the Sub-Chapter of the Criminal Law, 'Crimes against the socialist market economic order', and it can be seen

that the main purpose of the establishment of this crime is to safeguard the economic benefits and market order brought about by copyright and neighbouring rights of works. It can be seen that the main purpose of the Criminal Law in establishing this offence is to safeguard the economic benefits and market order brought by copyright and neighbouring rights. Both the Copyright Law and the Criminal Law reflect the protection of copyright, neighbouring rights, and the personal and economic benefits they may bring to the right holders, and in order to maintain the unity of the legal order, the protection of copyright should adhere to the position that civil and criminal law are consistent. [2]

From the perspective of punishing copyright infringement, Articles 52 and 53 of the Copyright Law provide for infringement of copyright and corresponding punitive measures, while Article 217 of the Criminal Law provides for the offence of copyright infringement, which includes 'infringement of copyright or copyright-related rights' as one of the constituent elements. As one of the constituent elements, it can be seen that the acts regulated by the Criminal Law are within the scope of the Copyright Law, and 'the two are basically the same in the direction of punishment, only the degree of harm is different.' Since the Criminal Law is not the same as the Copyright Law, it is not the same as the Copyright Law, and the Copyright Law is not the same as the Copyright Law. [3] Due to the severity of the criminal law, it should function as a safeguard and underpinning law, and should give full play to the role of the Civil Code and the predecessor law to the Copyright Law to limit the Criminal Law, i.e., to constitute the offence of infringement of copyright under the Criminal Law should be both civil wrongfulness and criminal wrongfulness, and to take the civil wrongfulness as the 'offence of infringement of copyright'. ' as an unwritten element of the constituent elements. [4] The same act cannot establish an offence of copyright infringement under criminal law to the extent permitted by civil law. [5]

3. Clarification of the definition of 'reproduction and distribution'

Article 14 of the 2004 Interpretation of the Supreme People's Court and the Supreme People's Procuratorate on Several Issues Concerning the Specific Application of Law in Handling Criminal Cases of Infringement of Intellectual Property Rights lists 'selling the infringing copies' as one of the circumstances of the offence of copyright infringement provided for in article 217 of the Criminal Law; and article 2 of the 2007 Interpretation (II) of the Supreme People's Court, Article 2 of the Interpretation (II) of the Supreme People's Procuratorate on Several Issues Concerning the Specific Application of Laws in Handling Criminal Cases of Infringement of Intellectual Property Rights (hereinafter referred to as the 'Judicial Interpretation (II)') in 2007 interpreted the term 'copying and distribution' to mean copying, distributing or both copying and distributing and stipulated that the act of 'selling Article 12 of the Opinions on Several Issues Concerning the Application of Law in Handling Criminal Cases of Infringement of Intellectual Property Rights (hereinafter referred to as 'Opinions on Several Issues Concerning the Application of Law in Handling Criminal Cases of Infringement of Intellectual Property Rights') of 2011, on the basis of interpreting 'copying and distribution' as copying, distribution or copying and distribution, defines total distribution, distribution, and distribution as the 'distribution'. Article 20 of the Amendment to the Criminal Law of the People's Republic of China (XI) of 2021 lists 'acts of dissemination on information networks' and 'reproduction and distribution' in parallel. The repetition of the interpretation of 'copying and distribution' in the above series of documents has led to a great deal of controversy in academic circles and judicial practice over the scope of 'copying and distribution'.

On the understanding of 'copying and distribution' in the offence of copyright infringement, the academic debate mainly focuses on two aspects: one is whether the interpretation of 'copying and distribution' is consistent among departmental laws; the other is the understanding of 'copying and distribution' between this and that offence within the criminal law. The second is the understanding of 'copying and distribution' between this and that offence within the criminal law. With regard to these two debates, there are three main views in the academic community: the negative distribution theory, the copying or distribution theory and the copying and distribution theory.

3.1 Issue denial

According to the distribution denial, 'reproduction for distribution' should be understood as 'reproduction' or 'reproduction with distribution', which excludes the mere act of distribution.[6]

First of all, scholars holding this view believe that the act of mere distribution, which is separated from the act of copying, should be regarded as the act of 'sale', and interpreting this act as 'copying and distribution' will, on the one hand, broaden the scope of punishment for the offence of infringing on copyright as stipulated in Article 217 of the Criminal Law On the one hand, it broadens the scope of punishment for the offence of copyright infringement under article 217 of the Criminal Law, lowering the standard of incrimination; on the other hand, it restricts the scope of adjustment of the offence of sale of infringing copies under article 218 of the Criminal Law, and even results in the vacancy of this offence.[7]

Secondly, interpreting the act of distribution, which is separate from the act of reproduction, as 'reproduction and distribution' may lead to confusion as to the constituent elements of the offence of copyright infringement.[8]The offence

of copyright infringement requires 'for profit', but does not require that the act be actually profitable, so 'for profit' is the subjective element of the offence of copyright infringement. However, the simple act of distribution, which is separate from the act of copying, is in fact an act of sale, and the essence of such an act is that profit is obtained through the transaction. Interpreting this as 'reproduction and distribution' would give this element the connotation of an objective constituent element, which in fact contradicts the legislative intent, leads to confusion in the constituent elements of the offence of copyright infringement, and is contrary to the principle of the appropriateness of crime and punishment.[9]

Finally, as to whether the simple act of copying can constitute an offence, the key lies in the two points of 'large amount of illegal proceeds' and 'seriousness of the circumstances', on which there are two views in the academic circle. One is the criterion of criminalisation, which holds that the simple act of copying but not distributing obviously does not cause harmful results, does not cause substantial economic or personal rights damage to the copyright owner or the owner of the copyright, and does not disrupt the market order, so only when the above two elements are complete will it constitute a crime, and it is the criterion of 'conviction'; another view is the criterion of res judicata. Another view is the criterion of attempt, which holds that when the above two elements are present, the offence has already been attempted and is the criterion for 'sentencing'. [10-11]

The author supports the theory of the criterion of successful completion of the offence of copyright infringement, 'for the purpose of making profit' is a subjective element, and the theory of the criterion of successful completion of the offence takes the objective fact of 'making profit' as the objective constituent element of the offence, which is obviously contradictory to the legislative intent. And the author believes that, as the foundation and core of copyright, the protection of copying right is an important way to protect copyright and neighbouring rights. If the act of copying is also excluded from the 'copying and distribution', it obviously restricts the scope of adjustment of the offence of copyright infringement too much, which is not conducive to the protection of the personal and property interests of copyright holders.

3.2 Reproduction or distribution

The claim of copying or distribution is in line with the 2007 Judicial Interpretation (II), i.e. 'copying and distribution' is interpreted as 'copying', 'distribution' or 'copying and distribution'. 'copy and issue'. This doctrine defines separate acts of reproduction and distribution as infringement of another person's copyright.

First, the doctrine of copying or distribution holds that 'copying' for profit may constitute an offence even if there is no material gain, which is consistent with the distribution denial.[12]

Secondly, the doctrine of copying or distribution holds that 'distribution' should also be interpreted differently from the definition of 'distribution' in the field of civil law and in the Copyright Law.[13]Under the WIPO Copyright Treaty, 'distribution' means the transfer of ownership by sale or otherwise.The EU Digital Single Market Copyright Guidelines define 'distribution' as the act of making the original work or a copy of it available to the public by offering it for sale or otherwise. China's Copyright Law lists rental rights and information network dissemination rights separately. It can be seen that the relevant areas of our civil law also adopt the narrower definition of 'distribution', i.e., distribution for the purpose of transferring ownership.[14] However, the identification of 'distribution' in the field of criminal law is not consistent with the interpretation of 'distribution' in the Copyright Law: the Copyright Law lists the acts of general distribution, wholesale and retail as the category of 'distribution', but the Criminal Law would obviously leave Article 218 'Sale of Infringing Copies' vacant if it followed this interpretation. In the Copyright Law, acts such as general distribution, wholesale and retail are included in the scope of 'distribution', but if the Criminal Law follows this interpretation, it is obvious that it will lead to the vacating of article 218, 'the offence of selling infringing copies'.[15] As a safeguard law, the Criminal Law cannot expand on the interpretation of 'distribution' in the Copyright Law, but it can restrict its interpretation so that the 'offence of infringing copyright' provided for in Article 217 of the Criminal Law will only regulate acts of distribution (e.g., wholesale distribution, printing and mass sale, etc.) that are of a relatively heavier degree of wrongdoing, and will include acts of a lesser degree of wrongdoing (e.g., retail sale) in the scope of the offence of selling infringing copies. The 'offence of copyright infringement' under Article 217 of the Criminal Law only regulates the relatively more serious acts of distribution (e.g. wholesale, general distribution, printing and large-scale sale, etc.), while less serious acts (e.g. retail sale) are included in the scope of the offence of selling infringing copies.

3.3 Reproduction and distribution

The doctrine of 'copying and distribution' states that 'copying and distribution' should be limited to 'copying and distribution', and that the act of distribution must include the act of sale, and that simple copying or distribution cannot constitute a crime of copyright infringement. [16]This doctrine holds that the interpretation of 'distribution' in the field of criminal law should be exactly the same as the interpretation of 'distribution' in the Copyright Law, which includes not only

the act of sale, but also the act of gift, and that if it is interpreted as 'copying or distributing', it will be an offence of authorised copying or distributing. If it is interpreted as 'copying or distribution', the act of unauthorised copying but unauthorised gift is also included in the scope of adjustment of the criminal law, which is not in line with the modesty of the criminal law. [17] As a prerequisite for 'distribution', 'reproduction' is the core of copyright protection, and if 'reproduction and distribution' is interpreted as 'reproduction and distribution', then for those who only make reproductions, the act of unauthorised gift is also included in the scope of the criminal law. If 'copying and distribution' is interpreted as 'copying and distribution', then the perpetrators who only make copies but have not yet carried out the act of distribution can not be effectively punished, and in the field of China's judicial practice, there are few punishments for attempted infringement of copyright, resulting in exemption from criminal law sanctions. This doctrine overemphasises the modesty of the criminal law, unduly restricts the scope of adjustment of the offence of copyright infringement, and is not conducive to the protection of copyright and related rights. [18]

3.4 Advocacy of reproduction or distribution

The author supports the 'copying or distribution theory'. First of all, the issuance of negative and copy and issue that obviously improperly limit the scope of adjustment of the criminal law, 'copy or issue that' can be better adapted to the current intellectual property rights environment continues to change and update, 'criminal law' is a safeguard for the law, but also has its independence, if mandatory for the 'copy and issue' completely consistent understanding will make the scope of adjustment of the criminal law is too large, but contrary to its modesty. Although the Criminal Law is a safeguard law, it also has its independence, and if it is mandatory for it to have the same understanding of 'copying and distribution', the scope of adjustment of the criminal law will be too large, which is contrary to its modesty.

Moreover, the different interpretation of 'distribution' in the Criminal Law and 'distribution' in the Copyright Law does not mean that it violates the position of consistency between civil and criminal law, and the regulation of 'distribution' in the Criminal Law is limited to the more serious acts of 'distribution' in the Copyright Law, which has not been interpreted in an expansive or opposing way. The regulation of 'distribution' in the Criminal Law is limited to the more serious 'distribution' in the Copyright Law, and has not been interpreted in an expansive manner or in an opposing manner. On the contrary, it is based on the consistent position of civil and criminal law, in order to better protect the dual legal interests of copyright, neighbouring rights and related rights and socialist market economic order, it is more appropriate to make a distinction between the concept of 'distribution' in the field of civil law and the field of criminal law, which in itself is a kind of systematic interpretation of the construction.

With the keywords of 'copying and distribution' and 'copyright infringement', the author searched the People's Court Case Database and China Judgment Website, and found 996 cases of relevant judgments, from which the author selected three judgments, in which the judges found that the defendants constituted the offence of 'copyright infringement', and the judges found that the defendants constituted the offence of 'copyright infringement'. 'The judge found that the defendant constituted the offence of copyright infringement, and applied the three interpretations of 'copying and distribution', i.e., copying, distribution, copying and distribution, as shown in Table 1, which confirms the interpretation of 'copying and distribution' in China's judicial practice. The above three judgements precisely confirm the interpretation of 'copying and distribution' in China's judicial practice.

Table 1. Representative judgements of the three interpretations of 'reproduction for distribution'

NO.	Cases	Merits	Acts
1	Zhong Moubing Copyright infringement case	The defendant, Zhong Moubing, did not obtain permission from the copyright owner to distribute his film and television discs, which was particularly serious and constituted a crime of copyright infringement. As the discs in question had not yet been sold, the defendant had attempted to commit the crime.	Reproduction (Attempted release)
2	Zhang Moumou Copyright infringement case	Defendant Zhangmoumou through the website management background, link to a resource network to obtain the film and television works seed file index address, and through the provision of the user and mandatory use of QVOD playback software for website users to browse and watch the film and television works, so as to complete the film and television works in the network of the dissemination of the case. But Zhangmoumou did not copy the film and television works, only link.	issue (stocks, currency etc)
3	Li Moumou and 9 others Copyright infringement case	Li Mou and others purchased the new Lego series of toys, through dismantling research, computer modelling, copying drawings, commissioned others to open the mould, set up a toy production plant, specializing in copying a company created 'Great Wall of China' and other 47 series of 663 models of assembled building block toy products, and crowned with the 'Le Pu' brand through online and offline sales. They were sold under the brand name 'Le Pu' through online and offline channels.	copy and distribute

4. Positioning of Artificial Intelligence in Copyright Infringement Offences

At present, artificial intelligence and related technologies are developing rapidly, at this stage, can it become a qualified criminal subject for the offence of copyright infringement, or can it only exist as a criminal tool? This affects the construction and determination of the offence of copyright infringement. The infringement of copyright by AI may be reflected in the whole process of research and development and use, which can be divided into the collection of training set data, the process of AI training and the content generated by AI to discuss the infringement of three aspects. By examining these three aspects, we will explore the position of AI in the offence of copyright infringement at this stage.

4.1 Copyright infringement in the acquisition of data for artificial intelligence training sets

The author will analyse whether the acquisition of AI training set data constitutes copyright infringement from the following two aspects: firstly, whether the source of the data constitutes infringement; secondly, whether the way of acquiring the data constitutes infringement.

The first is the source of AI training set data. Looking at the three mainstream AI technologies described in the previous section, it can be found that the core of these technologies require massive data support, so is the source of these data reliable and does it constitute an infringement of others' copyright? According to the classification of data sources, the author classifies them into open-source data and closed-source data. Open source data refers to those data that are legally obtained from publicly available or publicly accessible sources. Some open source data will be accessible only under the requirement of attribution, declaration, or adherence to certain industry rules, but most open source data is not overly restrictive.[19] Closed-source data is a symmetry of open-source data, which generally refers to data that is not open, cannot be opened, or has been released to the public but cannot be used without an authorised licence. The use of open source data is not overly controversial in the academic and judicial practice areas, and will not be repeated here; this paper focuses on the source and use of closed source data. Taking AI painting as an example, the three AI painting techniques introduced in the previous section are based on a large number of datasets for training, but in the field of original paintings, it is difficult to collect a sufficient number of paintings with guaranteed quality, which leads many developers to use crawler technology to save the painting data in different self-publishing media or other online platforms without the permission of the painting authors or copyright owners to support the model's learning and training. A small number of original painting AIs with a lower level of technology only splice different paintings in the training set, but the vast majority of models have technically processed the paintings in the training set, and although some features are retained to enable the authors of the original paintings to recognise their own works, they are not enough to form evidence to prove that their own paintings have been used for the training of the AIs without authorisation, which has led to the field of original paintings creation being the worst area of copyright infringement. This has led to the field of original painting creation becoming the hardest hit area of copyright infringement. Obviously, in this case, crawling, storing and using closed-source data without permission or authorisation has violated the copyright of others.

The second is the way of obtaining data. For some data that are more difficult to obtain or more cumbersome to obtain, the perpetrator often adopts the way of crawling, illegal leakage or trading to obtain, usually can be divided into direct infringement and indirect infringement.

The first is direct infringement, which usually occurs in two ways. The first way is the process of crawling closed-source data using data crawler technology, which requires intrusion into specific computer systems or web pages in order to obtain specific data. Therefore, although it only speeds up the process compared to manual searching for relevant information and then entering it, due to the covert and intrusive nature of its access, it will not only involve copyright infringement offences, but is often accompanied by the infringement of other people's privacy, disclosure of commercial secrets and other issues.[20] The author searched the People's Court case database and the China Judicial Instruments Network with keywords such as 'crawler' and 'data crawling', and listed five relevant criminal cases and the offences involved, as shown in Table 2.

As can be seen from Table 2, the use of data crawler technology to obtain data process, may cause the dissemination of computer viruses, leading to the leakage of citizens' privacy, damage to the computer system, and if the use of crawler technology for improper purposes, it will also be involved in the dissemination of obscene materials, illegal access to computer information system data and other offences. For the different objects invaded by crawler technology, if the invasion object involves international secrets, national defence, etc., it may also constitute the crime of illegal invasion of computer systems; if the invasion object involves the company's commercial secrets, it may also constitute the crime of infringing on commercial secrets.

Table 2. Some of the offences involved in data crawling techniques

NO.	Cases	Criminal Charge
1	Gong Moumou's case of dissemination of obscene materials for profit-making	Offence of distributing obscene articles for profit
2	The case of Ma Moumou and others illegally obtaining computer information system data	Offence of illegally obtaining computer information system data
3	The case of Qin, Lou and others helping information network criminal activities	Offence of facilitating criminal activities in the information network
4	The case of Lopsided Moumou Illegally Obtaining Computer Information System Data and Illegally Controlling a Computer Information System	Offences of illegally obtaining data from computer information systems, offences against citizens' personal information
5	The case of Wang Bo Yiwen and Huang Ye Xing for damaging computer information systems	Offences against computer information systems

The second is the illegal leakage or trading of data. As the quality of open-source data cannot be guaranteed, some actors, in order to better train their models, may enter into deals with some unscrupulous companies to illegally profit from the sale and purchase of platform users' personal information data or social media data, resulting in the leakage of user data. Obviously, such behaviour not only infringes on citizens' personal privacy, but also may infringe on the copyright of platform users when the data traded contains their personal creations and works. For example, in the case of Guangzhou Wow Bao Information Technology Co., Ltd. and Cai Moumou's infringement of copyright, the defendant used crawlers and other technologies to crawl a large number of pirated online literary works and publish them on a reading software developed by the defendant's company for users of the 'book city' to read and download free of charge, and used the platform to place advertisements as the main source of revenue, and the court ruled that. 'the defendant unit wowbao company for the purpose of profit, without the permission of the copyright holder, copy xuanting company enjoys the right to disseminate the work of the information network of 2964 written works, and through the information network to the public dissemination, the plot is particularly serious, the defendant cai moumou, as a directly responsible for the supervisor, his behaviour has constituted the crime of infringing on copyright.' In addition to this case, similar judgements were made in the Xiao Jun copyright infringement case, the Wang Shijie copyright infringement case, and the Zheng Mou and other copyright infringement cases. It can be seen that for the use of crawler technology to crawl other people's works for profit, it is possible to constitute the offence of copyright infringement.

The second is indirect infringement. Some model trainers do not directly use content explicitly protected by copyright or ownership, but in the process of using data crawler tools, due to the lack of specific supervision and screening and management mechanisms, they crawl to the relevant data that have been disseminated twice or repeatedly and are protected by copyright or ownership, which may constitute an infringement of copyright when used.[21] In addition, the crawled data itself can be an infringing work, and the potential for infringement exists when such data is used.[22] However, no criminal penalties have been imposed for such violations in judicial practice.

4.2 Infringement of the AI training process

From the perspective of the training process, there is a potential for infringement of the security of the data and information that is not adequately protected. Even for works or data that are authorised for use, there is a possibility of exceeding the boundaries of lawful and reasonable use during the training process, as various databases are linked, proofread, and the data is overlaid. For example, the possibility of copyright infringement still exists if the copyright owner's work information is stolen, leaked or disseminated, or traded because the authorised person (i.e., the programmer or designer who is authorised to use the information or work for the training of the AI) neglects to protect the data and the work. This requires AI designers or programmers to take a variety of measures to avoid infringement such as access control or copyright protection during the use of data or works, such as improving firewalls, conducting regular or irregular security tests, and strictly limiting the scope of data use.[23] However, in judicial practice, if the relevant data is leaked in the process of AI training, the authorised person often appears as a victim rather than the perpetrator of the crime, such as in the case of Yang Mou's illegal access to computer information system data and illegal control of computer information systems, and the cases of Chen Tianqi, Gong Haibo and Huang Jinjian's illegal access to computer information system data and illegal control of computer information systems, and so on.

4.3 Infringement of the output of AI training results

In terms of the output process of the result, there is still the possibility of copyright infringement by AI.2024 On 8 February 2024, the Guangzhou Internet Court issued a criminal judgement on the case of generative AI infringing the

copyright of the Ultraman IP, a case in which Japan's Yuanya Productions Co Ltd, as the copyright owner of the Ultraman series, authorised the plaintiffs of this case to make exclusive use of the copyright of the image of the Ultraman series in China in 2019 , and the plaintiff company enjoys independent rights to defend its rights. The Plaintiff found that when entering 'Generate Ultraman' and other similar commands on an AI website provided by the Defendant, the generated AI gave images that were substantially similar to the Ultraman IP, and did not indicate to the user that its AI drawing function was provided by a third party. In the judgement of this case, the court finally held that the defendant company had failed to fulfil its duty of care as a generative AI service provider, infringing the copyright of the Ultraman IP owned by the plaintiff, and should be held liable for civil damages. As can be seen from this case, if the AI simply eliminates watermarks and similarly replaces some elements of the works in the training set, whether it is an ordinary AI, a weak AI or a strong AI, this act is just a simple splicing or replacement of pixel points, and its generative object is still substantially similar to the works in the training set, and what it expresses is still the original author's thoughts and aesthetics; in such a case, the In this case, artificial intelligence generation obviously does not have 'originality', there is still the possibility of infringement.

Through the above judicial practice investigation, the author believes that the current is still in the period of weak artificial intelligence, artificial intelligence does not have the qualification of criminal responsibility, it still exists as a criminal tool, and does not affect the construction and determination of the crime of infringing copyright, and it can be interpreted and responded to through the current criminal law system, and will not be repeated here.

5. Determination of the scope of a 'work'

As the object of the offence of copyright infringement, the determination of the scope of 'works' is particularly important. As to whether the creation of natural persons is a work, China's copyright law already has a clear concept and provisions, and there is no problem in determining the attributes of works. However, as the field of AI becomes more and more extensive, the determination of the attributes of AI works becomes more and more important, which determines whether it can be included in the scope of protection of the Criminal Law and the Copyright Law. According to China's current Copyright Law and Regulations for the Implementation of the Copyright Law, works must be original and are intellectual achievements. Therefore, to determine whether the AI generation belongs to 'works', two key issues must be resolved: first, whether the AI generation has originality; second, whether the AI generation belongs to 'intellectual achievements'.

Some scholars, in their discussion of the subject qualification of strong AI, unilaterally emphasise that strong AI should undertake the obligations that it should undertake as a 'subject', but selectively ignore the rights that it can or should enjoy, and treat it as an 'object' that needs to be supervised and controlled when discussing the rights of strong AI. When discussing the rights of strong artificial intelligence, it is regarded as a 'thing' that needs to be supervised and controlled, but when discussing the responsibility of strong artificial intelligence, it is regarded as the subject of responsibility, which undermines the unity of rights and obligations required by the legal personality, not to mention the reconstruction of the criminal responsibility system. As Professor Liu Xianquan, a representative scholar of the strong artificial intelligence affirmation theory, pointed out, 'The intelligent machine brain can evolve like the human brain, produce autonomous consciousness and will, and through the deep learning mechanism ....., it is possible to become a new member of the human society in the same way as a human worker. '[24] The discussion of strong AI cannot be limited to the penal level, but should also focus on the granting of its rights.

5.1 Analysis of the originality of AI generatives

Whether an AI generator has originality is a complex issue involving the understanding and application of the concept of originality, as well as the role and positioning of AI in the creative process. From the perspective of copyright law, originality means that the work must be independently conceived by the author and have a certain degree of creativity in its expression. This means that the work cannot be a simple copy or imitation of an existing work, but should be a unique embodiment of the author's personal thoughts, feelings and expressions.

In the case of AI-generated objects, what we need to consider is the role and contribution of AI in the creative process. If AI is merely used as a tool or means to stitch together content in a database in accordance with predefined algorithms and models, lacking independent creation, such a generative object may not be original, as it lacks the independent conception and creative expression of the individual author. For example, in the cases of copyright infringement mentioned above, the perpetrators' use of various types of artificial intelligence to plagiarise other people's works or to make simple modifications or splicing of elements of the works does not qualify the generation as having originality.

However, if the AI plays a more active and creative role in the creation process, for example by learning and analysing a large amount of data and autonomously generating new and unique content, then such a generative product may have a higher degree of originality. In this case, AI is not just a tool, but becomes an important participant in the creative process,

and its generation can be regarded as a new type of creative achievement. For example, in the case of 'spring breeze sends tenderness', which is the first case in China involving the copyright of 'AI pictures', the main point of contention, including whether the picture constitutes a work. In its judgement, the court held that the plaintiff's use of AI to generate and publish the images reflected its original intellectual input, and was therefore recognised as a work of authorship, with the relevant copyright belonging to the plaintiff. The defendant used the image without permission and truncated the plaintiff's signature watermark, infringing on the plaintiff's right of signature and right of information network dissemination, and should bear corresponding civil liability.

5.2 Analysis of the attributes of 'intellectual achievements' of AI-generated products

The so-called intellectual results refers to the results produced through certain intellectual activities and thinking, and some scholars believe that the intellectual results must be based on the objective reality created by the human brain, while artificial intelligence is a machine, and cannot carry out the process of 'thinking'. In English, intellect and intelligence are both expressed as 'intellectual', which indicates that human intellectual activities and the 'intellectual' activities of artificial intelligence are not entirely unrelated. Formally, there is no obvious difference between human intellectual achievements and AI intellectual achievements in terms of expression form and ideological content, etc. Substantively, human intellectual achievements are the contents produced by the human brain through learning and thinking, and AI intellectual achievements are the contents produced through the accumulation and creation of deep learning algorithms, which are accumulated through prior learning and created by independent thinking under certain conditions. Both are works with originality, capable of conveying thoughts and feelings and expressing artistic aesthetics through prior learning and accumulation and under certain conditions after independent thinking, and there is no gap in substance. Although in the era of weak artificial intelligence, artificial intelligence can only learn, process and calculate the existing information, with a certain degree of mechanical, and need the assistance of human beings to create, which can only correspond to the level of the most basic human intellectual activities, but with the development of technology, in the era of strong artificial intelligence, artificial intelligence will gradually produce independent thinking and discursive strategies, and at this time, the works created by it and the works created by human beings will no longer have a The gap between the works created by AI and those created by human beings will no longer exist. Whether in the era of weak AI or strong AI, some of the AI products can be called 'intellectual achievements', for example, the poetry collection 'Sunshine Lost Glass Window', the painting 'Thoughts' and the song 'Peach Blossom Dream' created by Xiaobing, etc. On 29 June 2020, Xiaobing was awarded the 'Shanghai Conservatory of Music' by the Music Engineering Department of the Shanghai Conservatory of Music. On 29 June 2020, Xiao Bing was awarded the title of 'Honour Graduate' of the 2020 session of the Music Engineering Department of Shanghai Conservatory of Music.

To sum up, when an AI-generated work fulfils the two elements of originality and intellectual achievement, it can be regarded as a work and can be included in the scope of protection under the Copyright Law and the Criminal Law.

6. Determination of the Copyright Owner of Artificial Intelligence Works

In order to discuss the attribution of copyright in AI works, it is first necessary to clarify the legal interests protected by the offence of copyright infringement. Regarding the legal interests protected by the offence of copyright infringement, there are two views in the academic circle: the order view and the private right view. According to the order theory, since this offence is located under Chapter III of the Criminal Law of China, 'Crimes Against the Socialist Market Economic Order', the legal interests protected by this offence are the state's management order of copyright.[25-26] According to the private right theory, when determining the legal interests protected by the offence of copyright infringement, it should be based on the Civil Law, and since copyright has the attribute of private right, the legal interests protected by the offence of copyright infringement should, first of all, be the non-infringement of the intellectual achievements of the copyright owner.[27] However, in the author's view, in the era of artificial intelligence, neither the order theory nor the private right theory can well explain the legal interests protected by the offence of copyright infringement.[28] As Professor Richard Chang puts it: 'In criminal law, there is a large number of legislative phenomena that protect legal interest A (the back layer) for the sake of protecting legal interest B (the blocking layer)'.[29] The author holds the view of 'new order', combining the order theory with the private right theory, the legal interests protected by the offence of infringement of copyright are first of all the state's order of copyright management and the economic order of the socialist market, which implies the protection of the copyright owner's dominant position in the market competition.

6.1 Debate on the Attribution of Copyright in Works of Artificial Intelligence

After clarifying the legal interests protected by the offence of copyright infringement, the attribution of the copyright of AI works will be discussed. Whether it is the work of ordinary AI, weak AI or the work output by strong AI without

independent consciousness, there has been controversy in the academic community about the copyright attribution of its works, and there are currently the following six doctrines: designer, owner, legal person-like work, operator, common right and public work.

The Designer's Doctrine argues that the ideas expressed in AI works derive from the original intellectual labour of their designers.[30] Taking the poetry collection 'Sunshine Lost Glass Window' created by Microsoft Xiaobing as an example, although the work is output by Xiaobing after calculation and arrangement, it is essentially not the intellectual achievement of Xiaobing, but the creative achievement of the designer of Xiaobing, and some scholars believe that the concept of work of office or commissioned work, the author of which should be the designer of artificial intelligence.[31] Secondly, identifying the designer of AI as the copyright owner is in line with the requirement of the Copyright Law that the copyright owner is a natural person, and solves the dilemma of the difficulty of including AI works in the protection of the Copyright Law and the Criminal Law. In short, the designer's theory holds that whoever plays a major role in the creation of AI is the author of the AI work.

The owner doctrine is similar to the designer doctrine, which holds that the owner of an AI should be identified as the author of that AI work through mimetic technology.[32]

However, in the author's opinion, there are certain defects in the designer's and owner's doctrines. First of all, in order to include it in the scope of protection of the law and forced to explain the author of artificial intelligence works is the designer or owner is a little far-fetched, this doctrine seems to be conducive to the protection of the copyright of artificial intelligence works, but in fact it will be the cause and effect of the inversion, ignoring the age of artificial intelligence is not limited to the scope of the subject matter of the copyright of the problem of the natural person, but impede the progress of the legislation. Secondly, from the viewpoint of expression of ideas, although the designer or owner of AI has invested his/her thoughts and energy in writing programmes for AI or acquired the ownership of AI through transactions, it does not mean that all the expressions of AI embody the thoughts of its designer or owner. Take the collection of poems 'Sunshine Lost Glass Window' as an example, this collection of poems is actually a product created by Xiaobing after learning the works of more than a hundred modern poets, and possessing the ability to create poems through continuous iteration and deep learning of the algorithm and 'thinking' thereafter, and this 'thinking' process is not a part of its design or ownership. This 'thinking' process is not under the intervention or control of the designer, and what is expressed is not the thoughts and artistic aesthetics of the designer of the AI, and the work is also a work created independently by Xiaobing, and its author cannot be identified as the designer or owner.

The legal person-like work theory argues that AI works are similar to legal person works. However, it is clear that the legal person-like work theory cannot explain the definition of works created by natural persons using artificial intelligence. Secondly, the scope of legal person works is much smaller than that of AI works. Legal person works are commonly used in the determination of copyright ownership of written works, but AI works include written works, paintings or photographs, songs and other aspects.[33]

The operator theory argues that copyright in AI works should go to the operator of the AI.[34] This doctrine holds that artificial intelligence is only a tool to assist human creativity, and does not have its own independent expression of thought and artistic aesthetics, and that the process of outputting results is merely the process of arriving at the results through procedural calculations under the instructions of human beings. In short, whoever inputs the instructions for creation to the AI is the author of the work.

The doctrine of co-ownership holds that when a natural person or entity uses an AI to create a work, the copyright of the work should be jointly enjoyed by the operator and designer of the AI, and the AI itself is not regarded as a party to the co-operation.

However, the operator and co-ownership doctrines cannot explain the copyright ownership of original works created by strong AI based on autonomous consciousness, i.e., in the era of strong AI, not all works are completed under the operation of human beings, which is flawed from a long-term perspective.

According to the public work theory, it is difficult to attribute rights to AI works, therefore, once created, it can be shared by the public to avoid a lot of troubles and social problems, and its copyright should be attributed to the public, not a private work.[35] However, this doctrine ignores the possibility that the same expression exists for AI works. If they are directly categorised as public works for the free use of the community at large, they are prone to the phenomenon of a large number of AI works being passed off as personal works.[36] Instead of avoiding social problems, this doctrine will lead to chaos in the order of copyright administration.

6.2 Advocacy of dual subject structure of copyright

In the author's view, whether it is the designer's theory, operator's theory, legal person-like work theory, operator's

theory, co-ownership theory or public work theory, all of them have their insurmountable defects and drawbacks. The author advocates to give the same legal evaluation to AI works and human works, so as to realise the equal protection of copyright law.

For weak AI, the author believes that at this stage, it is not yet possible to completely detach itself from human participation to carry out creation (mainly manifested in the fact that the creation process requires frequent human-computer interaction and testing and correction), so the deep participation of human authors in human-computer interaction can be taken as a source of originality, which will enable AI works to obtain the protection of the copyright law. The least costly solution for equal protection of AI works under copyright law is to identify AI works as the appropriate type of work in different creative fields in order to maintain legal conceptual consistency with similar works. The institutional realisation of equal protection under copyright law for AI works requires the use of legal modelling techniques. Legal mimicry can evaluate things with different factual characteristics in the same way, which is the application of type thinking at the legislative level. By legal mimicry of AI as an author and establishing a copyright legal relationship such as co-creation and commissioned creation with human authors, the origin of originality of their works can be solved, which in turn enables them to pass the originality test. The author suggests that the binary subject structure that has matured in the copyright law can be borrowed to properly deal with the problem of ownership distribution of human-computer interaction, based on the normative principle of separation of the two functions of the legal subject and through legal reasoning, so that the AI is only a formal subject and does not actually enjoy the copyright to ensure that human beings become the ultimate acquisition of the copyright of the works of artificial intelligence. Taking the legal relationship of human-computer interaction as a whole as the source of originality of AI works: AI can be modelled as an author with reference to the dual subject structure of copyright, which actually modelled the countless user participation and massive data training behind AI as a functional creative subject, so as to establish a co-creative relationship or entrusted creative relationship between AI and AI users in accordance with copyright law. The transfer of copyright from AI to humans is realised through legal reasoning: transferring the rights of AI works to AI users can be seen as a reasonable consideration for AI designers to encourage AI users to participate in data training, improve technical performance, and maintain a competitive edge. Drawing on the mechanism of the aforementioned binary subject structure, in the human-machine interaction relationship, the AI is regarded as the author, and the co-creation relationship of human-machine co-operation or the commissioned creation relationship of machine entrustment can occur between the AI and the AI user; and because the AI is only a formal subject rather than an interested entity, it only plays the function of legal reasoning in the legal relationship, and ultimately, the effect of concentrating the interests of the work to the AI user will directly occur.

As for the works independently created by strong artificial intelligence based on independent consciousness, since it has independent control and recognition ability, it can independently assume responsibility and enjoy rights, and thus it can be both the author and the copyright holder of its works, which is no different from a natural person.

7. Improvement of the offence of copyright infringement in the age of artificial intelligence

Nowadays, artificial intelligence, as an efficient and convenient auxiliary tool, is more and more widely used in various fields of production and life, and has a greater and greater impact on social development. For the crime of copyright infringement under the field of artificial intelligence, the elements of its constituent elements should be clarified firstly, adhere to the stance of consistency between civil and criminal punishment, and make a reasonable explanation for copying and distribution, and take civil wrongfulness as the unwritten constituent elements of this crime.

In the era of artificial intelligence, artificial intelligence may be both a criminal tool and a criminal object. Therefore, on the basis of clarifying the constituent elements of this offence, it is more in line with the needs of the times to include the AI generated material that meets the requirements of the work into the scope of protection of this offence and to clarify the attribution of the copyright of the AI work. It should be noted that the criminal law, as the underpinning and safeguarding law, should firstly improve the Copyright Law from the standpoint of consistency between the civil and criminal law, and include the AI generated objects that meet the attributes of works into the scope of its protection, so as to give them the status of works under the copyright law. In addition, the scope of works can be clarified through the copyright registration system. [37] Unlike the existing copyright attached to works once they are created, the copyright registration system has a number of advantages: first, it raises the standard for the identification of works, excludes some contents of low or no artistic value from the scope of copyright protection, leaves more room for the survival of works of higher artistic value, and prevents the massive influx of low-quality works of AI into the market, resulting in the effect of the bad money driving out the good, and squeezing the survival of excellent works. Secondly, the copyright registration system can clarify the subject of the rights of

the works, and prevent the subsequent civil and criminal disputes from being difficult to divide the rights and responsibilities or not clearly defined. Finally, the copyright registration system can better protect the two legal interests of copyright management order and market economic order, which is consistent with the legislator's original intention.

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