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Can the 'AI-generated Content' Be Protected as 'Work' under Copyright Law?

---Jurisprudential Developments in China

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Abstract: Recent Chinese cases of the copyright disputes on AI-generated content (AGC) reveal challenges to copyright jurisprudence by Natural Language Processing (NPL)-based AI systems. Some scholars argued from the perspectives of intellectual characteristics of the AGC. This paper, however, combines historical and doctrinal methods to show that the production process of AGC should be the defining factor of work. This paper argues that modern copyright law does not protect the AI-generated content from the aspect of copyright law in intellectual writings/ paintings/ music/ art as 'work'. 'Work' in the history of copyright law requires direct human intellectual labor, which the AI lacks. AI does not have physical and / or mental labor to the levels of humans, and the human physical and intellectual labors put into building the AI system is different from the AI's production of contents. These are two separate and consecutive processes: humans make AI, and AI automatically generates contents. The second process cannot produce work because it does not involve comparable labor to humans.

Keywords: AI-generated content, copyright, work, labor theory, production process

1. Introduction

This paper concerns the legal status of 'AI-generated content'1 in copyright law. It asks the question: Can the 'AI-generated content' be protected as 'work' under existing copyright law?

Today, technological advances are occurring on a daily basis and touching everyone's life to the point that some believe the present age to be really revolutionary, dubbed "Industry 4.0" in Germany or the fourth industrial revolution in general. Artificial intelligence (hereinafter "AI") is one of the great breakthroughs of this new era. AI is a wonderful creation of our period, since it is capable of not only assisting humans with various jobs, but also with producing original creative production,

[1] Many scholars adopt the "AI-generated works". However, from my perspective, the reason why using "works" by scholars is applying the social concept of "works", but not the meaning on copyright law. Therefore, this paper considers that the character of the AI-generated content has not been settled down, and cannot be recognized as "works" from the aspect of copyright law. It can just be considered as a kind of production or output of AI with creation. This proposal adopts the phrase "AI-generated content".

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including literary, artistic and musical ones[2]. This prompts us to consider the link between AI's production and creativity. Can present copyright laws still account for this phenomenon of that AI producing creative content? Without a question, AI presents a significant threat to current copyright laws.

Nonetheless, AI has always lacked a consistent and widely accepted concept[3]. The lack of definitional clarity is partly due to the fact that AI encompasses a wide number of mathematical and conceptual frameworks, and a variety of terminology have been included into the broader notion. Fundamentally, however, the question of what constitutes "artificial intelligence" arises because developers of AI have pursued various objectives for the discipline, ranging from mimicking but ultimately surpassing a person's capacity to solve certain problems to fully simulating the human brain's activities [1]. AI is no longer a branch of conventional computer science, but a distinct field of study founded on machine learning. "Machine Learning" refers to a subfield of computer science concerned with computer programs that are able to learn from experience and thus improve their performance over time [2]. As will be discussed, the idea that the computers are "learning" is largely a metaphor and does not imply that computers systems are artificially replicating the advanced cognitive systems thought to be involved in human learning. Rather, we can consider these algorithms to be learning in a functional sense: they are capable of changing their behavior to enhance their performance on some tasks through experience [3]. Also, machine learning is a branch of AI and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy[4]. Without human programming, AI can study all types of data, synthesize new language, and make judgments on its own via machine learning. While human programmers are engaged in the initialization of the fundamental algorithms, they have no control over how the AI learns and creates, nor can they predict the result of the learning.

While AI mimics and seeks to outperform the human learning process, AI is ultimately not human, causing huge complications when attempting to characterize AI's production. That is because no matter the system of the right author or the copyright system both hold the creativity of human as core of copyright law at this stage. For the perspective of the system of the right of author, the author must be a human; besides the copyright system incentive the author from spiritual perspective to create new works.

The issue manifests itself in a variety of ways, but it also offers excellent research material for this research. Firstly, the current copyright law cannot recognize the AI outputs as works directly, originality is the key to determine whether the outputs can be regarded as works, it is difficult to determine whether the AI outputs involve the originality or enough originality. Secondly, under the current copyright law, once the outputs are regarded as works, the writer is naturally considered as the author and then own the copyright, which means the works must bear the imprint of the author's personality. However, AI is not human and its outputs lack personality. AI cannot be naturally regarded an author, and thus AI cannot own copyright. If copyright laws do not protect AI outputs, they flow into the public domain, where anybody may use and distribute them freely. Some argue that this will have a significant impact on the economic success of AI firms. While AI businesses engage extensively in research and development of AI outputs, they receive no profit or revenue since copyright laws classify them as public domain, stifling excitement for investing in AI research and development. As a result, it is vital to debate whether AI outputs (AI-generated content) should be subject to copyright protection.

[2] Written production: AI-Dreamwriter of Tencent create some literal article; Fine art production: AI help to recover the famous masterpiece <The Night Watch> of Rembrandt; Musical production: The Musical Transformer developed by Google can learn the masterpiece of Mozart and Liszt and then create new music.

[3]This can be seen at Artificial Intelligence, *https://plato.stanford.edu/entries/artificial-intelligence/#WhatEx-acAI*, accessed 2021/09/25.

[4] This concept can be seen at Machine Learning, *https://www.ibm.com/cloud/learn/machine-learning#toc-w-hat-is-ma-qhM6PX35*, accessed 2021/09/25.

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However, at this point in time, when discussing the creation of AI, the academic community finds itself in a paradoxical situation where the copyright of AI products is restricted while the question of whether AI can be referred to as the author is not addressed. To explain whether AI products are copyrightable from the perspective of works, scholars must first explain the ownership of copyright by works, which brings them back to the fundamental question of who is the author or authorship of works, which in turn leads to the legal and ethical question of whether AI itself can be considered an author. Correspondingly, some scholars try to bypass the question of whether AI itself constitutes an author, and directly believe that while the products of AI constitute a work, the copyright of the work belongs to a specific human subject.

In addition, the impact of AI creation on the existing copyright law cannot be fundamentally solved from the perspective of whether the products have copyright or copyright ownership. Therefore, we should go back to the origin of copyright law and discuss the copyrightability and copyright ownership of AI products from the essence of copyright law.

These are clearly cursory debates, and only the most fundamental concerns and possible conflicts between the research of AI and copyright law are highlighted here. Even a cursory listing demonstrates that AI offers major difficulties to current copyright law, and this complex and demanding information serves as the research framework for this study, with the next sections of this proposal attempting to expound on additional substantive parts.

Surrounding this topic, academic circles have great disputes and different opinions on whether AI-generated content can be copyrightable.

On one hand, AI-generated content should be protected by copyright law.There are several reasons to support this argument. Firstly, both the labor theory and personality-rights prism of traditional copyright law cannot prevent AI-generated content from being protected by copyright law. The ultimate creative production of AI can be traced back to an initial human input and contribution, which is a sine qua non condition. In the absence of the creation of productive and creative AI by a human, and the setting of circumstances for AI creativity by a human, there will not constitute emergent works [6]. Secondly, AI-generated content owns originality.AI-generated content does come from the reasoned and intelligent consideration rather than the mechanical process or random selection; moreover, Colin R. Davies takes music production as an example. AI systems is able to produce musical scores without there being a need for any notes, sequences or segments being comprised within the original programme [5]. Thirdly, copyright protection ensures the investment in AI development. Because technical protection measures cannot be applied to protect AI-generated content, it would be misappropriated, suffering from the potential free-riders. Without the exclusive rights offered by copyright law, competitors actually are able to sell AI-generated content under the generators' marginal costs, and hence create disincentives for undertakings to further invest in AI creations and innovations. Therefore, based on the investment theory, copyright law should offer protection to AI-generated content [6].

On the other hand, in addition to what are discussed above, there are also series of opinions reject to the protection on AI-generated content under copyright law. The reasons are stated in following. Firstly, it is unnecessary to consider the protection of AI-generated content. Even if AI models appear 'intelligent', they generate output by merely relying on probability calculations. They are not autonomous, they do not 'reason' on their own, and they need to be fine-tuned by machine learning experts [7].

Secondly, copyright law is a human-centric law, AI-generated content cannot be protected by copyright law without human involvement. From the first aspect, copyright is considered an inherently anthropocentric legal field, and it has not been substantiated that either the deontological justification or economic-utilitarian justification can rationalize the extension of the intellectual property system to cover AI creations without human creative input [7]. From the second aspect, authorship is

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intrinsically linked to requirements for protection. Where there is no human author, a work cannot be original; and without originality, a work cannot be protected by copyright [8]. From the third aspect, as for the qualification for undertaking responsibility, one important feature of copyright is that human authors both get rights in what they do and are liable for it. These are sides of a normative coin, but AI is not also liable for those types of trespasses [9]. To explain it further, AI as a legal object cannot sign licenses deals or employment contracts [10].

Thirdly, AI cannot sense the incentives. Under the incentive theory, the AI itself is not conscious of or responsive to incentives, since they are not human beings [8][11][12]. Natural persons may be driven by intrinsic motivations, such as self-expression or connecting with others through creating and revealing their works. Robots lack comparable self-awareness. In addition, from the angle of the incentive theory, AI is not susceptible to the incentives which are provided by intellectual property rights, and that thus other tools of stimulating investments might be sufficient [13].

Fourthly, AI-generated content should be included in the public domain. That is because the public domain is the natural alternative path to privatization. In addition, placing AIs creations in the public domain allows for creation of new knowledge and easier access to information, to name only a few advantages [8].

Finally, but certainly not least, protecting AI's creative output would have a detrimental effect on current public welfare. As for the market, copyright of AI-generated content might foster market concentration and stifle the entry of new ventures into the market, because competitors with access to AI will have huge advantages over those without; As for human, it might be seen as a kind of devaluation of hu man efforts if automatic creations were rewarded in the same way [13].

2. The Classification of Role of AI in Production

2.1. AI Assisted Production

In the context of weak AI, AI is usually regarded as a tool used in the process of human creation, that is, human beings express through the use of AI. The positioning of AI in this process is like a painter's brush and a software programmer's computer system. Human beings use AI because it can realize large-scale and large-scale data analysis through powerful in-depth learning on the basis of big data, so as to output high-quality content in a very short time [6]. In this case, no matter how powerful the text and data mining functions and deep learning functions AI runs, AI does not have any awareness of independent creation in essence, and AI is essentially completing the tasks delivered by human beings; Or human beings are using the powerful ability of AI to complete their creation. Therefore, in this case, AI undoubtedly exists as a tool. The purpose of all its functions is to complete human creative tasks, and its output content is within human creative needs.

2.2. AI Independent Production

In the strong AI context, AI has independent creative consciousness. In the process of text and data mining, AI can independently determine the objects it wants to mine and then learn; In the process of deep learning, the process and purpose of AI learning are determined by itself; After autonomous mining and autonomous learning, the results derived reflect their independent creative intention. The AI creation process in the strong AI context can match the human creation process and meet the level or requirements of human independent creation. This has triggered the impact of AI products on the existing copyright law.

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On the issue of AI independent creation, the EU[5] has adopted a direct and active attitude, which provides a reference for national legislation. In the report on intellectual property promoting the development of artificial intelligence technology released in October 2020, the EU's treatment of AI products is mainly summarized as follows: first, AI products can be used as works to obtain the protection of copyright law; Second, the protection of AI products does not mean that AI can obtain the same status as human authors. The law should not seek to endow artificial intelligence with independent legal personality, so as to avoid negative impact on stimulating human authors' creation. Third, even if the new legal framework can propose measures to deal with the autonomous generation of AI, the final distribution of rights and interests involved should belong to natural or legal persons, not artificial intelligence itself. It can be seen that in order to encourage investment in AI industry, the EU agrees that AI products should be protected by copyright; However, no matter whether AI has the characteristics of independent creation or not, it should not obtain the same status as human beings, thus affecting human interests.

3. Updated Justice of Chinese Courts

In China, the core of copyright law is the creativity of human at this stage. Chinese copyright law incorporates the elements from both the system of the right of author and the copyright system, for the perspective of the system of the right of author, the author must be a human, besides the copyright system incentive the author from spiritual perspective to create new works.

3.1. Overview of Case of Tencent v. Yingxun Tech[6]

Tencent claimed that, Tencent used Dreamwriter software to collect and analyze the text structure of articles reporting on similar sports events and the needs of readers of different types of sports events, then formed the structure of the article according to Tencent's unique will to express itself. Tencent is entitled to the copyright of such article. The defendants infringed the copyright that Tencent owned.

According to the court, firstly, the texts generated by Dreamwriter software can be regarded as the works under the copyright law. In terms of the entire generation process, if what the Dreamwriter software automatically generated is regarded as a creation, there is no human involvement and that it is simply the result of the computer software running established rules, algorithms and templates, but the automatic operation of the Dreamwriter software is not unprovoked or self-aware.

The automatic operation reflects the plaintiff's choice. If the automatic operation of the Dreamwriter software were to be regarded as a creative process, this would, in a sense, treat the computer software as the subject of creation, which would be inconsistent with the objective situation and would be unfair. Therefore, from the analysis of the generation process of the article in question, the expression of the article is determined by the individual arrangement and choice of the plaintiff's creative team, and its expression is not unique and has a certain degree of originality.

Secondly, the texts generated by Dreamwriter software can be regarded as the works of legal person or entity. The article was a work of intellectual creation by the plaintiff's multi-team, and reflects the plaintiff's need and intention to publish articles on sports events. The end of the article stated "this article is automatically written by Tencent robot Dreamwriter", which the "Tencent" signatures point to the combination of its release platform should be understood as the plaintiff, indicating that the article in question by the plaintiff is responsible for the article.

[5] EU has published < Intellectual property rights for the development of artificial intelligence technologies> on 20 October 2020. See *https://www.europarl.europa.eu/doceo/document/TA-9-2020-0277_EN.html*.

[6] See Tencent v. Yingxun Tech, (2019) Yue 0305 Min Chu 14010.

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3.2. Overview of Case of FILM v. Baidu[7]

The FILM law firm claimed that, the texts, generated by computer artificial software, consists of both a textual work and a graphic work, it can be considered as the works of legal entity. Baidu argued that the texts contains both graphics and text, but it is a report obtained using legal statistical data analysis software. The data in the report was not obtained through research, search or collection by the plaintiff, and the graphs in the report were not drawn by the plaintiff, but generated automatically by the analysis software.

According to the court, firstly, under current legislation, a written work must be created by a natural person. Although, with the development of science and technology, such texts generated by computer software are becoming closer to humans in terms of content, form and even expression, according to the current level of technological and industrial development, the current legal system of protection of rights can already provide sufficient protection for the intellectual and economic input of such software, so it is not appropriate to break through the basic norms of the subject of civil law. It is not appropriate to break through the basic norms of the subject of civil law. The Court therefore held that the completion of a human's creation should still be a necessary condition for a written work in the field of copyright law.

Secondly, based on the human's creation requirement, the software developer obviously had nothing to do with the creation of the analysis report; the user of the software only submitted keywords for search in the operation interface, and this behavior did not convey the original expression of the software user's thoughts and feelings, so it was not appropriate to consider the user's creation as complete. Therefore, neither the software developer nor the user should be the author of the generated content of the computer software in question, and the content cannot constitute a work.

4. The Development of Copyright from a Historical Perspective

4.1. The Origin of Copyright

Copyright originally originated from commercial war. In the era of high publishing cost, publishers demand to crack down on piracy, in order to protect the legitimate interests. With the aim of realizing the purpose of maintaining genuine books, publishers make the most use of the subject of "author". Publishers emphasize that literary property belongs to the authors, and the author's labor needs to be respected. However, in the whole process, the publisher skillfully excluded "author" from the scope of long-term interest acquisition. The publisher believes that "author" only has the right to substantive literature itself. Once the "author" sells the original to the publisher and loses the physical control over the original, the publisher will obtain all permanent rights of the literature, "author" then is separated from the literary entity, and the publisher only needs to pay the first and only one time purchase cost. It can be said that the copyright system is not really related to the author, or really protect the author's related rights. On the contrary, it is the system promoted by publishers in order to consolidate their monopoly privileges [14]. At this stage, the copyright sought by publishers focuses on the concept of "work", emphasizing the authenticity of "work" and the interests of publishers behind "genuine" works. Therefore, there is no correlation between "work" and "author" at this stage.

Although "author" does not actually get relevant benefits, the concept of "author" has attracted attention, since it has been used by publishers. In practice, some authors began to sue for practical interests. In the case of Pope v. Curll[8], it had established that the copyright of the letter belongs to the writer himself. Based on this, the concept of literary property separates the universal concept of the identity of "author" from the owners of substantive manuscript, that is, the entity itself is not only

[7] See FILM v. Baidu, (2018) Jing 0491Min Chu 239.
[8] See Pope v. Curll [1741] in Mark Rose, Authors and Owners---The Invention of Copyright Reprint edn. HUP (1995).

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associated with the subject identity of "author". When the entity is separated from the actual control of "author", the "author" is still related to the substantive manuscript itself, and the "author" still enjoys rights to it. In the long-term struggle between the author and the publisher, the judges' identification of the author's identity is more and more divorced from the traditional concept and began to put forward that the author is a commodity producer initially [15].

When the "author" began to become the subject of copyright, the copyright system assumed the value of encouraging creation. From the perspective of incentive theory, copyright law is an institutional tool to stimulate information production and dissemination through right allocation [16]. The legitimacy of incentive theory comes from the hypothesis of rational man and the principle of externality in economics. As for the rational person hypothesis, when facing the legal norms, individuals consider the legal consequences caused by their behavior from the perspective of income and cost and make behavior conducive to the realization of their own interests. The legal norms themselves can encourage rational people to make effective choices for their own behavior. Based on the nature of rational man, the law can give the ownership of resources to the subject who can give full play to the benefits through the allocation of rights. Secondly, as for the principle of externality, human behavior has externality, and personal behavior in society will have an impact on the welfare of others. Whether positive externality or negative externality, it is borne by people other than the actor [17]. Combined with the rational person hypothesis and externality theory, legal norms can affect the behavior choice of actors through different right allocation, transform the externality of their behavior into their own private costs and private benefits, encourage actors to achieve the maximum benefits with the minimum cost, and achieve the optimal social benefits with the optimal personal benefits. In the incentive theory, it can be seen that the basis is that the encouraged subject can actively understand the legal norms faced and can actively perceive and think about the benefits or legal consequences caused by his specific behavior.

4.2. Key Factors of Copyright

The copyright system includes copyright subject, copyright object and copyright content. The current mainstream view mainly holds that the copyright subject and the copyright object complement each other. In addition to the special provisions of the law, such as job-related works, the most intuitive situation is that an individual creates an object in the sense of copyright law and becomes the copyright subject, that is, the object of copyright law is created by the copyright subject, The subject of copyright can become the subject of copyright because it has created enough individuals to constitute the meaning of copyright law.

The object in the sense of copyright law needs to meet the conditions of originality and replicability, in which the originality condition is the core of the copyright object and the most controversial condition. As the author's position in the copyright system is gradually recognized, how should the author's thought be protected; and out of the legal cost, how to judge whether the content created by the author is worth protecting is an important content to be concerned. In the case of “Millar v. Kincaid”[9], the judge held that the ideas and contents exchanged in the knowledge books advocated by the author are the embodiment of the author's personality. Therefore, literary and artistic works belong to the author because any work is the specific expression of the author's personality. One of the connection points between originality and material property or intangible property is value, the other is personality. In copyright law, personality is the basis of value. Creation is an individual's individual reflection of nature. An expression behavior that does not reflect originality cannot be called creative behavior [14].

[9] See Millar v. Kincaid [1747] in Mark Rose, Authors and Owners---The Invention of Copyright Reprint edn. HUP (1995).

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The judgment of originality is one of the most controversial issues in the copyright law system. At this stage, the standards of originality in national legislation are different, and the application of originality in specific judicial practice also presents specific different standards. But the core is that the creator needs to have a certain degree of intellectual creation. When creating works, the author independently uses his intelligence and skills, selects the constituent elements of the works, organizes them according to the rules and order determined by himself, and expresses his inner real experience and feelings, real positions and views, real thoughts and emotions.

5. Distinction Between Processes of human Developing AI and Process of AI-generated Content

5.1. The Essence of AI-generated Content

5.1.1. Arguments and Reasons for Disputes over the Copyrightability of AI-generated Content

The reason why AI product has great controversy on copyright is that it conforms to the characteristics of object in the sense of copyright law. According to the foregoing, the object in the sense of copyright law is original and reproducible, and the core element is originality. In the process of AI generating content, because of its strong learning ability, AI can mine text and content for "learning", and "create" content that is different or even brand-new from existing works on the basis of learning [5]. Specific AI system does not and does not need to copy other subjects (the subject here does not directly refer to the subject in copyright law) Including existing content generated by other AI or humans. The content generated by a specific AI system has personality and is the self-thinking expressed by the AI system after self-learning. Therefore, scholars began to think about whether AI products can be recognized as objects in the sense of copyright law.

The resulting controversy is whether AI products can be identified as objects in the sense of copyright law, not only the object itself, but also the subject of copyright is an inevitable important content. On the one hand, whether AI, as a non-human, can become the subject in the sense of copyright law; On the other hand, identifying the subject is not only the surface problem of confirming who is the subject, but also the deeper problem is who can enjoy and exercise the corresponding copyright. Obviously, AI, as a non-human, can neither enjoy nor exercise copyright [18].

There are series of following theories have been put out. First, AI electronic personhood theory, which follows the model of corporate personality, abstracts AI as non-entity personality and participates in legal relations [19]. The endowing of "electronic personhood" reflects the fact that it is not necessarily limited to human beings with specific personality while talking about creation[10]. In the latest intellectual property report, the EU explicitly denied that AI has electronic personhood and consider it radical inadmissibility[11]. Besides, the view of establishing personhood of AI, including electrical personhood of AI, cannot gain sufficient support in academic circle. For one thing, a "personality" would be a mere formality, as the AI would not be able to assume obligations and responsibilities in the legal relationship. Naturally, a central fund would have to be founded to make AI become financially responsible. As a result, ‘AI-personhood’, including ‘AI-electrical personhood’ would not actually work [20].

For another thing, the ‘AI- personhood’ does not solve the problem of who can authorize or enforce intellectual property rights in the event of infringement by others [13]. It is also important to note that AI's personality cannot be equal to the judicial personality of the company. This is because companies

[10] The European Parliament has put forward the concept of " AI electronic personhood " on January 2017. See DRAFT REPORT with recommendations to the Commission on Civil Law Rules on Robotics, *https://www.europarl.europa.eu/doceo/document/JURI-PR-582443_EN.pdf?redirect*.

[11] Electronic personhood can be seen at Artificial Intelligence and Civil Liability, *https://www.europarl.europa.eu/RegData/etudes/STUD/2020/621926/IPO-L_STU(2020)621926_EN.pdf*.

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remain directly linked to human influence; they neither make their own autonomous decisions nor learn skills on their own as a separate entity, which is quite different from AI [13].

Second, the agent system, or the system of commissioned works, regards AI as the commissioned person who is commissioned to create by the subject of copyright rights. If the content generated by AI constitutes an object in the sense of copyright law, the subject who commissioned AI creation will be regarded as the author [21]; However, this theory leads to the questions of establishment of which subject is the most appropriate principal. On the contrary, the reasonable and convincing conclusions have not been reached at this stage. Some scholars consider that assigning rights to programmers ensures the sufficient incentive for themselves [4]. While other scholars hold counterviews that he programmer's incentive have been sufficiently taken into account "higher up the chain" by other kinds of intellectual property protection for the elements of the specific AI tools, or rather the sales or licensing revenues pertaining thereto [22][23][24]. Some scholars support that AI can serve as "employee" of human based on 'hire doctrine'. The hire doctrine can be applied to assign the copyright of the AI-generated content to human, providing incentives to AI programmers and owners. That is because AI-programmers have the biggest contribution to AI-generated content [25]. Nevertheless, some scholars consider that the copyright cannot be assigned to AI programmers but the users of AI. That is because users are able to initiates the creative AI-generated content [26]. Therefore, ownership, control, and responsibility would be imposed on the humans or legal entities that use AI systems and enjoy its benefits [23].

Third, the protection of AI-generated content should be based on Anti Unfair Competition Law[12], jump out of the constraints of whether AI products are objects in the sense of copyright law, and regulate the improper use of AI products through anti unfair competition law [27].

5.1.2. The Difference Between AI-generated Content and Human Creative Works

It is starting from whether AI-generated content can be identified as the object of copyright law to explore whether AI-generated content can be copyrighted, and the right subject of the product is considered to be an incidental dispute. The author believes that the study of whether AI-generated content have copyright should not be from the perspective of object, but from the perspective of subject.

The reason why works can become works is that they meet the conditions of originality. Originality is the reflection of the personality of the creative subject, and the reflection of personality is related to the creative subject's own unique way of thinking and process, which is the individual response. In this process, originality needs the creator's intellectual creation to a certain extent.

Throughout the different originality standards in various countries in the world, the standard of "input skills, labor or judgment" represented by the UK[13], the standard of "reflecting the author's personality" represented by France [28] and the standard of "a small amount of creativity" represented by the United States [29] all have the same emphasis point in that they put forward requirements for the degree of originality. Even though different countries or regions have different standards for originality, the same thing is that the authors need to pay a certain input of intellectual and labor, which means that the authors need to experience different kinds of process of thinking, data collection, learning and transformation and so on. That is, the authors need to pay sufficient creative costs in the creation process, including the cost of mental exercise and physical exercise.

This is the objective characteristic of human beings. Human beings cannot always maintain a high focused attention and thinking ability. Besides, human learning ability and creative ability are uneven,

[12] Japan Copyright Law considers that realigning AI-production's protection to unfair competition rather than a broader expression-based scheme. See Japan Eyes Rights Protection for AI Artwork, *http://asia.nikkei.com/Politics-Economy/Economy/Japan-eyes-rights-protection-for-AI-artwork*.

[13] This doctrine can be seen in several cases. Eg, University of London Press, Limited v University Tutorial Press, Limited [1916] 2 Ch 601; Ladbroke (Football) Ltd v William Hill (Football) Ltd [1964] 1 WLR 273; IInterlego AG v Tyco Industries Inc [1989] AC 217.

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and human beings cannot keep creating permanently. It is precisely because of this series of objective characteristics of human beings that copyright law is designed with incentive function. Creation in the sense of copyright law requires human beings to pay varying costs. Therefore, human beings need incentives to continue to create.

Just because human beings have the perception ability, can perceive the value of motivation, and can actively think and judge; therefore, creation can bring benefits to human beings themselves.

Correspondingly, AI has strong computing ability, mining ability and learning ability. AI can break through the cost of human creation and generate new content at a very low or even close to zero creation cost. In the process of AI producing content and producing originality, it does not need to pay specific or even huge mental activities and physical labor that human beings deal with. In this case, the incentive mechanism constructed by the copyright law loses its value, and the production can be completed without incentive in the process of AI-production. At the same time, as a non-living body, AI cannot perceive the incentive effect and respond to the incentive effect. Therefore, if the process of AI-generating content is incorporated into the copyright law system, the value constructed by the copyright law itself will be overhead, and all concepts of the copyright law will be reconstructed in essence.

However, at this stage and for a long time in the future, even if AI generated content can keep pace with human creation, AI generated content cannot completely replace human creation. Therefore, copyright law cannot be reconstructed by AI generated content, and copyright law should still focus on human creation

5.2. Applying the Doctrinal and Historical Analysis in Chinese Latest Cases

It can be compared from the court's decision that the two courts had a completely different mindset.

In the case of 'Tencent v. Yingxun Tech'[14], the court avoided the core issue of whether AI was the subject of copyright in order to be able to apply Chinese current copyright law to the case, and directly identified the subject of copyright as Tencent company, the legal person. The court ruled that the AI-generated content could constitute a work on the premise that the copyright subject could be recognized by the existing copyright law. In effect, the court identified the AI system as a tool to assist human creativity, not as the subject of 'creation'. Therefore, the court's determination of whether the generated content was a work could be made solely on the basis of whether the content met the criteria for a work, without addressing the issue of the subjectivity of the AI.

This can only be described as a realistic approach to accommodate Chinese current copyright law, but in fact subtly avoids answering the question of the copyright properties of the AI's autonomously protected content. For the perspective of the court, the disputes should be addressed under the current copyright law, and the court have no power to create some new right or some new position in copyright.

Reviewing Tencent company's position, in order to make up for the loss, Tencent company tried to make himself the author of the texts that generated by the Dreamwriter software as well as make the texts was recognized as works under Chinese copyright law. Therefore, Tencent can prevent anyone infringe his copyright by using the texts to make profits without his permission. Tencent is a company that he does not focus on the essential legal relationship between the author and the work, the position of AI outputs in copyright law, he just focusses on the profit of the AI outputs, which cost huge investment. So, the market subjects try to take the advantage of the influence of copyright to protect the investment of AI research.

[14] Tencent v. Yingxun Tech, (2019) Yue 0305 Min Chu 14010.

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In totally contrast to the case of 'Tencent v. Yingxun Tech', in the 'FILM v. Baidu case'[15], the court answered the question of the legality of the copyright subject directly. Rather than focusing on whether the AI-generated content could meet the criteria of 'work', the court directly denied the possibility of AI as a copyright subject under Chinese current copyright law. The court did not go into the reasons why AI does not qualify as a subject of copyright, but simply displayed the reason that the subject of copyright can only be human. Although I agree with the court's judgment in the case, I do not agree with the legal reasoning.

In conjunction with aforementioned doctrinal and historical analysis, the Beijing Court should clarify that the reason why AI cannot be the subject of copyright is that the cost of the intellectual and labor input of AI is not at all comparable to that of humans. The intellectual and labor costs that an AI invests in the process of learning, analyzing and writing about creative works are extremely low or even close to zero. In contrast, the cost of intellectual and labor input spent by humans in the creative process is extremely high. The high cost of human creative input is the starting point of copyright law legislation, and the process of producing content by AI is fundamentally inconsistent with the legislative purpose and institutional value of copyright law. Therefore, AI cannot be the subject of copyright, and there is no need to further discuss whether the content it generated meets the criteria of a work.

Reviewing at the two latest cases together, it is possible to conclude a highly practical and economical phenomenon. In both cases, the winning party was the Chinese head giant Internet and AI companies. This is an interesting and inescapable phenomenon. The diametrically opposed legal reasoning and judgments of the two courts resulted in victories of the top Internet and AI companies. In China, the judiciary has tended to focus on safeguarding the interests of the top technology companies, guiding them through judgments to reduce the costs and barriers to their AI development.

Such a judicial tendency may has certain social benefits and economic outcomes, but the author believes that justice should not sacrifice the legislative value and legal authority of copyright law to achieve so-called realistic social outcomes. The R&D interests of head technology companies should not be grafted onto or transferred to the legislation and judicial practice of copyright law, thus leading to the improper and unreasonable expansion of copyright law in legislation and judicial practice, resulting in the interests that copyright law really needs to protect falling through the cracks

5.3. The Different Modes of Protection on the Process of Human-developed AI and AI-generated Content

When AI products cannot be included in the copyright law system for protection, where should AI products go.

The author believes that, firstly, AI generated-products should enter the public domain. Copyright law is the ratio and mutual movement of public knowledge system and private work system. No one can control the content in the public domain through copyright. Public domain is the natural alternative path to privatization [8]. Correspondingly, the public can have unrestricted access to ideological information. The division of the public domain in modern copyright law takes originality as the boundary. Ideas, operation methods, technical schemes and use functions, facts and non-original compilation of facts, official documents, competitive sports activities, and works beyond the term of copyright protection all belong to the content of the public domain.

The reason why we divide the public domain and the private domain of knowledge is that the ultimate purpose of establishing the copyright law system is to maximize the freedom of expression and the utility of knowledge. Although AI-generated content cannot be included in the copyright law for protection, it does not prevent them from being accumulated as knowledge, so as to be shared by

[15] FILM v. Baidu, (2018) Jing 0491Min Chu 239.

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all mankind and realize the social justice of maximizing the total amount of knowledge. Placing AIs creations in the public domain allows for creation of new knowledge and easier access to information, to name only a few advantages [8].

Secondly, it should be divided into R & D stage of AI by human and AI generated-content stage. The process of AI generating content has some characteristics shared by human creation, but it cannot be protected by copyright law because it cannot be compared with the cost of human creation in essence. The process of human research and development of AI and the process of AI generated-content are two completely separated stages in law. Research and development of AI by human is the research and development process, while AI, as an independent entity, generating content is the production process of AI itself. The two should not be confused.

However, this does not prevent human beings from being infringed by other acts in the process of AI research and development; and return to specific laws for targeted treatment according to specific infringements. For example, the confidential contents of human R & D AI can be protected by trade secrets; Specific AI code sequences can be protected by copyright law; Specific inventions and creations can be protected by the patent law; AI entities can seek the protection of property law if they suffer damage. The author believes that the theory of agent system or entrusted works in the academic circle confuses the process of human R & D AI and the process of AI generating content. Take AI as the agent or trustee of the subject behind the research and development of AI or the subject investing in the research and development of AI.

After dividing the process of human R & D AI and the process of AI producing content, it is possible to clearly distinguish the laws pointed by different objects, and different contents are regulated by different laws.

6. Conclusion

This paper argues that things created by AI cannot be protected by copyright law due to the lack of comparable intellectual labor to humans from an aspect of labor approach—including physical and intellectual labors. This paper combines historical and doctrinal methods. It adopts a labor understanding of the early debates on copyright theories, and apply this labor approach as an alternative to the current doctrinal analysis in Chinese case laws.

The paper first uses Chinese case laws to show the problem is real in judicial practices. It is troubling not only Chinese judges but also courts in other jurisdictions. In these two cases, it shows that the logic of two judgement is totally different. In the case of ‘Tencent v. Yingxun Tech’, the court considered that whether AI-generated content could constitute a work should be based on originality directly, and took Tencent company as the ‘author’ of the work, bypassing the problem of the status of AI in the process of AI production. In the case of ‘FILM v. Baidu’, the court denied that the content generated by AI constituted the work from the perspective that the work should be created by human being initially. Therefore, two courts reflect that in the dilemma of AI creative production, some courts will avoid the subject of AI and directly consider the character of the work; some courts deny AI's subject status from the perspective of non-human beings, so as to deny that the AI creative production constitutes a work.

The second part provides the theoretical framing of this paper. It uses a historical analysis to remind readers of the origin and evolution of modern copyright law, i.e., to protect the labors/processes of human creations, instead of the product. Two major theoretical approach are compared, the first one focuses on features of work, and the personal interests protected by the copyright law; the second one is based on an intellectual labor understanding of human creation of work.

The third part, combined with the research methods of the second part, explains that AI will not invest a lot of labor cost and intelligence cost in the process of creative production like human beings. From the perspective of incentive theory, copyright law is to encourage human beings to continue to

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create even in the face of a large amount of cost investment, so as to protect the rights of human authors involved in creation.

However, when AI does not need to invest a lot of costs like human beings, the copyright law does not need to set up a copyright to protect AI in order to stimulate AI creative production. Therefore, the creative products of AI should not be protected by copyright law. At the same time, it should discriminate that human R & D of AI and AI creative production are two completely different processes. The cost of ensuring human investment in AI R & D should not be grafted to the aspect of AI creative production. That is, the protection of human R & D of AI investment should not be realized by protecting the copyright rights and interests in the process of AI creative production. At the aspect of ensuring R & D investment, it can be realized through patent law or other civil law contents.

From the aspect of legal practice, this paper helps judges in China and the world to better understand how to deal with real-life cases involving the creation by AI. Theoretically, it also contributes to the understanding of the labor approach to copyright law and why it is important in our modern legal system. This paper clarifies that those 'work' which have been invested with labor and intellectual costs in the creative process can be protected by the copyright law. This is important because practically there will be more cases and theoretically it helps understand the nature of modern copyright law in the AI era.

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