

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/CLSR
**Computer Law
&
Security Review**


Copyright protection for AI-generated outputs: The experience from China

Yong Wan*, Hongxuyang Lu

Law School, Renmin University of China, China

ARTICLE INFO

Keywords:

AI-generated output
Copyright
Originality
Human intervention
Ownership
Chinese Copyright Law

ABSTRACT

Artificial intelligence (AI) is involved more frequently in the creative process nowadays, which raises debates associated with copyright protection for its outputs across the globe, China included. On 25 April 2019, the Beijing Internet Court released the first decision in relation to the copyrightability of the output automatically generated by computer software in China. In this case, the Beijing Internet Court held that copyrightable works should be created by natural persons, and therefore denied copyright protection for the output intelligently generated by computer software although it possessed originality. In another case decided on 24 December 2019, the Nanshan District Court of Shenzhen approved that the output automatically generated by computer software was copyrightable, holding that the review generated by an intelligent writing software conformed to the formal requirements of written works and it could be granted copyright protection.

This article analyses these two cases in detail and describes the experience of China in copyright protection for AI-generated outputs. As the first two cases about copyrightability of AI-generated outputs in China, the two cases play a significant role in future copyright protection of such outputs nationally and internationally. The two cases indicate that some of AI-generated outputs are eligible for copyright protection in China. Instead of challenging the existing doctrines of modern copyright regime, the two decisions provide a mechanism for copyright protection of AI-generated outputs within the current human-centered copyright law realm.

© 2021 Yong Wan and Hongxuyang Lu. Published by Elsevier Ltd. All rights reserved.

1. Introduction

For years, artificial intelligence (AI) has made extraordinary achievements in a wide variety of arenas. Nowadays, AI is able to achieve superhuman performance.¹ With the exten-

sive use of AI in creative fields, it is hard to distinguish works created by human beings from those generated by AI. As a virtual artist, AIVA released the first album named 'Genesis' in 2016 and is capable of registering the music with the Society of Authors, Composers and Publishers of

* Corresponding author: Yong Wan, Law School, Renmin University of China, Room 905, Beijing 100872, China
E-mail address: wanyong@ruc.edu.cn (Y. Wan).

¹ See David Silver, Julian Schrittwieser, Karen Simonyan, Ioannis Antonoglou, Aja Huang, Arthur Guez et al., 'Mastering the Game of Go Without Human Knowledge' (2017) 550 Nature 354, 354.

Music.² In May 2017, the first AI-generated poem collection in Chinese was published in China.³ The AI-generated painting named 'Edmond de Belamy' was sold for USD 432,500 in 2018.⁴ While AI will undoubtedly get more involved in the creative realm in the near future, one crucial and complicated question arises: can AI-generated outputs gain copyright protection?⁵

Two courts in China took the lead in answering the question judicially. As the first case which analysed copyrightability of AI-generated outputs in China,⁶ the Beijing Internet Court⁷ concluded in *Beijing Film Law Firm v Beijing Baidu Netcom Science & Technology Co Ltd (Film)* that being created by natural persons was a prerequisite for written works to be protected under the Copyright Law of the People's Republic of China (Copyright Law of China), the output intelligently generated by computer software therefore was not a copyrightable subject matter although it possessed originality.⁸ As the first case which judicially confirmed the AI-generated outputs could be granted copyright protection in China,⁹ the Nanshan District Court of Shenzhen recognised the human creator's selection and arrangement involved in producing the relevant output, and ruled that the output generated by Dreamwriter—an intel-

ligent writing computer software—satisfied the requirements for written works and therefore was protectable under the Copyright Law of China in *Shenzhen Tencent Computer System Co Ltd v Shanghai Yingxun Technology Co Ltd (Tencent)*.¹⁰

The two cases not only play an essential role in copyright protection for AI-generated outputs in China, also have significant influence internationally.¹¹ The extensive use of sophisticated AI in creative process causes one of the most complicated and universal debates in modern copyright law. In the development of several centuries, copyright law has effectively adapted multiple times for diverse challenges caused by technological advancement.¹² Facing the issue brought by AI, as the discussion when the new modes of communication emerged, we need to consider carefully that 'are new formulations of rights required, or do the old formulations still hold good, necessitating only a flexible interpretation to apply to these changed conditions?'¹³ The most vital impact of *Film* and *Tencent* is that they provide a scheme for copyright protection of AI-generated outputs under the current human-centered modern copyright law realm. The judicial experience of China indicates that AI-generated outputs, at least some of them, can gain copyright protection without the need to reform existing legal rules.

The justifications for copyright protection, such as personality theory, law and economics, and labor theory, may contribute to justifying copyrightability of AI-generated outputs.¹⁴ In general, the civil law countries adopt the natural right justification, while the common law countries justify copyright based on the utilitarianism.¹⁵ However, the system of copyright law in China adopts a mixed approach.¹⁶ To some

² Aiva Technologies, 'Composing the Music of the Future' (Aiva Technologies, 24 September 2016) <<https://medium.com/@aivatech/composing-the-music-of-the-future-4af560603988#t8d6dkxi8%3E>> accessed 30 June 2021. For more information about AIVA, please see 'About AIVA' (AIVA) <www.aiva.ai/about#about%3E> accessed 30 June 2021.

³ This poem collection is also AI-authored. See Xiaobing, *Sunshine Misses Windows* (Beijing United Publishing Co Ltd 2017).

⁴ For the details about the painting, please see 'Edmond de Belamy, from La Famille de Belamy' (Christie's) <www.christies.com/lotfinder/prints-multiples/edmond-de-belamy-from-la-famille-de-6166184-details.aspx?from=salesummary&intObjectID=6166184%3E> accessed 30 June 2021.

⁵ The 'AI-generated output' discussed in this article refers to content generated by AI which would gain copyright protection if it was created by a human being. The concepts 'AI-generated output', 'computer-generated output' and 'output generated by computer software' are used somewhat interchangeably in this article.

⁶ Ming Chen, 'Beijing Internet Court Denies Copyright to Works Created Solely by Artificial Intelligence' (2019) 14 *Journal of Intellectual Property Law & Practice* 593, 593. See also Beijing Internet Court, 'Beijing Internet Court Civil Judgment (2018) Jing 0491 Min Chu No 239' (Beijing Internet Court, 28 May 2019) <https://english.bjinternetcourt.gov.cn/2019-05/28/c_168.htm%3E> accessed 30 June 2021.

⁷ Beijing Internet Court, founded on 9 September 2018, is a specialised court which centrally governs the first-instance internet-related cases within the jurisdiction of Beijing. For more information about the Beijing Internet Court, please see Beijing Internet Court, 'Beijing Internet Court' (Beijing Internet Court, 26 March 2019) <https://english.bjinternetcourt.gov.cn/2019-03/26/c_26.htm%3E> accessed 30 June 2021.

⁸ *Beijing Film Law Firm v Beijing Baidu Netcom Science & Technology Co Ltd* (2018) Jing 0491 Min Chu No 239 (Beijing Internet Court) (Film). For English translation of this judgment, please see <[www.chinadaily.com.cn/specials/BeijingInternetCourtCivilJudgment\(2018\)Jing0491MinChuNo.239.pdf](http://www.chinadaily.com.cn/specials/BeijingInternetCourtCivilJudgment(2018)Jing0491MinChuNo.239.pdf)> access 30 June 2021.

⁹ Wei Zhang, 'The First Case in the Field of AI Writing was Decided, the Court Confirmed for the First Time that Work Generated by AI Was Original and Protected by the Copyright Law' *Legal Daily* (Beijing, 8 January 2020) 8.

¹⁰ *Shenzhen Tencent Computer System Co Ltd v Shanghai Yingxun Technology Co Ltd* (2019) Yue 0305 Min Chu No 14010 (Nanshan District Court of Shenzhen) (Tencent).

¹¹ Andres Guadamuz, 'Impact of Artificial Intelligence on IP Policy' <www.wipo.int/export/sites/www/about-ip/en/artificial_intelligence/call_for_comments/pdf/ind_guadamuz.pdf%3E> accessed 30 June 2021, 2.2 (stating Tencent is 'the first legal case in the world involving a copyright work authored by a sophisticated AI'); Zhengxin Lu, 'The Case of "Copyright of AI" in Jingfawangshi, 'Listen to What the Judges Say About the Cases Written in the Work Report of Beijing Higher Court' (25 January 2021) <<https://mp.weixin.qq.com/s/kUcWdXObPqhlEeOzrfRwHg%3E>> accessed 30 June 2021 (stating that there was no prior case in national or international context for reference in the trial of Film).

¹² Craig Joyce, Tyler Ochoa, Michael Carroll, Marshall Leaffer and Peter Jaszi, *Copyright Law* (10th edn, Carolina Academic Press 2016) § 1.05 [A].

¹³ Sam Ricketson and Jane C Ginsburg, *International Copyright and Neighbouring Rights: The Berne Convention and Beyond*, vol 1 (2nd edn, OUP 2006) 721.

¹⁴ Regarding discussions about the justifications for copyright protection, see eg Shlomit Yanisky-Ravid, 'Generating Rembrandt: Artificial Intelligence, Copyright, and Accountability in the 3A Era: The Human-like Authors Are Already Here: A New Model' (2017) 2017 *Mich St L Rev* 659, 699-707; Justin Hughes, 'The Philosophy of Intellectual Property' (1988) 77 *Geo L J* 287, 287-366; Robert P Merges, *Justifying Intellectual Property* (Harvard University Press 2011) 31-136.

¹⁵ Paul Goldstein and P Bernt Hugenholtz, *International Copyright: Principles, Law, and Practice* (4th edn, OUP 2019) 5.

¹⁶ Yong Wan, 'Moral Rights of Authors in China' (2010) 58 *J Copyright Soc'y USA* 455, 455-56.

extent, the copyright law system in China follows the *droit d'auteur* tradition. For example, the terminologies used in the relevant regulations, the division between economic rights and moral rights, and the exhausted list of exceptions and limitations, all reflect the influence from civil law countries.¹⁷ On the other hand, the Copyright Law of China adopts the utilitarian theory.¹⁸ Article 1 of the Copyright Law of China explicitly states that one of the purposes of the law is 'encouraging the creation and dissemination of works which would contribute to the construction of socialist spiritual and material civilisation, and promoting the development and flourishing of socialist culture and sciences'.¹⁹ Due to this combination, copyright protection for AI-generated outputs under the copyright law system of China is controversial, but flexible.

The article analyses *Film* and *Tencent* which are recent two cases in China pertaining to copyrightability of AI-generated outputs. By detailing the two cases, this article highlights China's experience and judicial approach adopted in copyright protection for AI-generated outputs.

2. Works protected under the Copyright Law of China

Article 3 of the 2010 Copyright Law of China states that the 'works' mentioned in the Law include those of literature, art, natural science, social science, engineering technology and the like created in the listed nine forms.²⁰ Since Article 3 of the 2010 Copyright Law of China does not provide the definition of work, Article 2 of the Regulation for the Implementation of the Copyright Law of the People's Republic of China (Regulation for the Implementation of the Copyright Law of China) defines, '[t]he term "works" as referred to in the Copyright Law means original intellectual achievements in the fields of literature, art and science that can be reproduced in a tangible form'.

¹⁷ Yong Wan, 'The Meaning of Cinematographic Works from the Perspective of the Functionalism: Comments on the Second Instance Judgment on Phoenix Case' (2018) 40 *Modern Law Science* 95, 102.

¹⁸ Guobin Cui, 'Criticism of Intellectual Property Judge-Making Law' (2006) 1 *China Legal Science* 144, 151-52.

¹⁹ Article 1 of the Copyright Law of the People's Republic of China (Copyright Law of China) states, '[t]his Law is enacted, in accordance with the Constitution for the purposes of protecting the copyright of authors in their literary, artistic and scientific works and rights related to copyright, encouraging the creation and dissemination of works which would contribute to the construction of socialist spiritual and material civilisation, and promoting the development and flourishing of socialist culture and sciences'.

²⁰ Article 3 of the 2010 Copyright Law of China states, "[w]orks" mentioned in the Law shall include works of literature, art, natural science, social science, engineering technology and the like created in the following forms: (1) written works; (2) oral works; (3) musical, dramatic, quyi, choreographic and acrobatic art works; (4) works of fine art and architecture; (5) photographic works; (6) cinematographic works and works created in a way similar to cinematography; (7) drawings of engineering designs and product designs, maps, sketches and other graphic works as well as model works; (8) computer software; (9) other works as provided in laws and administrative regulations'.

Combining the above requirements, to be qualified for copyright protection in China, a work must satisfy five requirements: (1) it is original; (2) it should be created; (3) it is an intellectual achievement; (4) it must in the literary, artistic or scientific domain; (5) it can be reproduced in a tangible form.²¹ For AI-generated outputs discussed in this article, they are usually in the literary, artistic or scientific domain and can be reproduced in a tangible form. Thus, whether the AI-generated output is eligible for copyright protection depends on the other three prerequisites: (1) whether it is original; (2) whether it is created; and (3) whether it is an intellectual achievement.

The 2010 Copyright Law of China was modified in November 2020 and the new amendment entered into force on 1 June 2021.²² Article 3 of the new amended Copyright Law of China provides the definition of work, which states "[w]orks" mentioned in the Law shall refer to original intellectual achievements in the fields of literature, art and science that can be presented in a certain form'.²³ The new Article 3 also lists nine forms of works and amends the miscellaneous provision from 'other works as provided in laws and administrative regulations' to 'other intellectual achievements that meet the characteristics of works'.²⁴ This modified provision shows an open attitude towards categories of copyrightable subject matters under the copyright law system of China. However, the new amendment does not incorporate AI-generated outputs into the list of protectable subject matters, which means that AI-generated outputs can be protected in copyright only when they meet the relevant prerequisites for copyrightable works mentioned above.²⁵

²¹ The 2010 Copyright Law of China was modified in November 2020 and the new amendment entered into force on 1 June 2021. Article 3 of the new amendment of the Copyright Law of China changed the requirement 'can be reproduced in a tangible form' in Article 2 of the Regulation for the Implementation of the Copyright Law of the People's Republic of China (Regulation for the Implementation of the Copyright Law of China) to 'can be presented in a certain form'. This article does not detail differences between the two requirements because usually AI-generated outputs can satisfy them both.

²² *Film* and *Tencent* were determined under the 2010 Copyright Law of China. Hence, the legislations discussed in this article are mostly associated with the 2010 Copyright Law of China.

²³ Article 3 of the new amendment of the Copyright Law of China states, "[w]orks" mentioned in the Law shall refer to original intellectual achievements in the fields of literature, art and science that can be presented in a certain form, including: (1) written works; (2) oral works; (3) musical, dramatic, quyi, choreographic and acrobatic art works; (4) works of fine art and architecture; (5) photographic works; (6) audiovisual works; (7) drawings of engineering designs and product designs, maps, sketches and other graphic works as well as model works; (8) computer software; (9) other intellectual achievements that meet the characteristics of works'.

²⁴ *Ibid.* See also 2010 Copyright Law of China, art 3.

²⁵ Although Article 3 of the new amended Copyright Law of China does not mention the work which can be protected in copyright should be created, this article still believes it is a prerequisite for copyright protection. This is mainly because the two requirements-'should be created' and 'should be intellectual achievement' are always combined when deciding copyright protection for works; see the discussions in 2.2.

2.1. Originality

The legislations pertaining to copyright in China do not explicitly define or provide a standard for originality.²⁶ Article 15 of the 2002 Interpretation of the Supreme People's Court Concerning the Application of Laws in the Trial of Civil Disputes over Copyright states, '[w]ith regards to a work created by different authors on the basis of a same topic, the authors shall enjoy independent copyright if the expression of the work is completed independently and is creative'.²⁷ It can be seen from this article that the originality can be divided into two parts: (1) being completed independently; and (2) being creative. Yet the standard for creativity is undefined.

The concept of originality remains undefined in legislation is the common approach adopted by most jurisdictions around the globe.²⁸ Generally, criteria for originality in civil law countries is higher than its common law countries counterpart,²⁹ but such divergence has gradually decreased in recent years.³⁰ The copyright law system in China combines the characteristics of the civil law system and the common law system, the evaluation of originality in practice in China therefore is uncertain and complicated. Some courts hold that a certain degree of intellectual creation can satisfy the requirement of originality,³¹ whereas some courts believe that works protected in copyright law should express personality of the creators.³² There is also another opinion combines the standard between the certain degree of intellectual creation and the expression of personality of the author.³³

2.2. Work should be created and should be an intellectual achievement

Article 3 of the 2010 Copyright Law of China indicates that works protected in copyright are created.³⁴ Article 3(1) of the

Regulation for the Implementation of the Copyright Law of China further explains the definition of creation, which states, '[t]he term "creation" as referred to in the Copyright Law means intellectual activities in which literary, artistic or scientific works are directly produced'. Hence, whether the behaviour is intellectual activity and whether the behaviour has direct connection with the specific expression of work should be determined when deciding whether a behaviour is creation.

In fact, the definition of creation under Article 3 of the 2010 Copyright Law of China and Article 3(1) of the Regulation for the Implementation of the Copyright Law of China does not clearly indicate that such behaviour must be completed by human beings. However, the behaviour of creation is correlative with intellectual activity and intellectual achievement. The behaviour of creation is intellectual activity which directly produces works,³⁵ and the produced works are intellectual achievements.³⁶ Traditionally, only human intellectual activity can be regarded as the behaviour of creation and works protected by copyright law should be the result of human intellectual creation.³⁷

3. The latest two cases concerning AI-generated outputs

As the first two cases discussing copyrightability of AI-generated outputs in China and even the world,³⁸ Film was mentioned as a typical case when the president of Beijing Higher Court made the report on the work of Beijing Higher Court,³⁹ and Tencent was selected by the editorial department of the People's Court Daily as one of the top ten cases of the people's court in 2020.⁴⁰ The two cases not only indicate the courts have deeply considered the role played by AI in the creative process, also show the open attitude of the courts in China towards legal protection for AI-generated outputs. Although the two courts reached different conclusions and adopted slightly different approaches, they actually assessed same issues-originality, whether the output is created by human beings, authorship and ownership.

3.1. The Film case

On 9 September 2018, the plaintiff-Beijing Film Law Firm, published a report named 'Analysis Report on Judicial Big Data of the Film and Entertainment Industry: Film Volume-Beijing' (Big Data Analysis Report) on its WeChat official account, which introduced data regarding judicial decisions in the film industry in Beijing and consisted of 4511 words and 15 graphics. On 10 September 2018, part of the Big Data Analysis Report was posted without permission on the platform operated

²⁶ Article 2.2 of the Beijing Higher Court's Guidelines for the Trial of Copyright Infringement Cases describes two factors need to be considered in determining originality-whether the expression was independently created by the author and whether the arrangement of expression shows author's selection and judgment. However, it is a local judicial document, and the concept of originality is yet unclear.

²⁷ The 2002 Interpretation of the Supreme People's Court Concerning the Application of Laws in the Trial of Civil Disputes over Copyright was amended in December 2020 and entered into force on 1 January 2021, but Article 15 was not modified.

²⁸ Ying Jiang, 'A Comparative Study on the Criteria for Judging Originality of Works' (2004) 14 Intellectual Property 8, 8.

²⁹ United Nations Educational, Scientific and Cultural Organization, *The ABC of Copyright* (Yuze Zhang tr, Shoukang Guo ed, Intellectual Property Publishing House Co Ltd 2009) 20.

³⁰ William W Fisher III, 'Recalibrating Originality' (2016) 54 *Hous L Rev* 437, 439-47.

³¹ See eg *Shenzhen Mitsubishi Stationery Co Ltd v Mitsubishi Pencil Co Ltd* (2013) Hu Yi Zhong Min Wu (Zhi) Zhong Zi No 170 (First Intermediate Court of Shanghai); *Hangzhou Xiaoshan Network Media Co Ltd v Cao Xiaoli* (2018) Yu Min Zhong No 1539 (Henan Higher Court).

³² See eg *Ren Mode v Fengze District Miqixing Restaurant* (2019) Min 05 Min Chu No 1866 (Intermediate Court of Quanzhou).

³³ See eg *Beijing Yuanjian Cultural Communication Co Ltd v Alibaba Cloud Computing Co Ltd and Alibaba (China) Co Ltd* (2011) Chao Min Chu Zi No 31507 (Chaoyang District Court of Beijing).

³⁴ See n 20.

³⁵ Regulation for the Implementation of the Copyright Law of China, art 3(1).

³⁶ *Ibid* art 2.

³⁷ Qian Wang, *Copyright Law* (China Renmin University Press 2015) 17.

³⁸ See n 6, n 9, n 11.

³⁹ Jingfawangshi (n 11).

⁴⁰ Xingyu Dong, 'Top Ten Cases of the People's Courts in 2020' *People's Court Daily* (Beijing, 9 January 2021) 4.

by the defendant-Beijing Baidu Netcom Science & Technology Co Ltd (Baidu Company). Claiming that its right of communication through the information network⁴¹ and other rights⁴² were infringed, Beijing Film Law Firm filed an action against Baidu Company before the Beijing Internet Court. The defendant argued that the Big Data Analysis Report was automatically generated by a legal statistical data analysis software-Wolters Kluwer Legal Database, and therefore it could not be protected by copyright law due to the lack of originality.

On 25 April 2019, the Beijing Internet Court issued the decision of *Film* which partly in favor of Beijing Film Law Firm, holding that the text part of Big Data Analysis Report was created individually by the plaintiff, instead of being automatically generated by Wolters Kluwer Legal Database.⁴³ In this decision, the court denied copyright protection for general Analysis Report automatically generated by Wolters Kluwer Legal Database.

3.1.1. Originality

From the perspective of generating process, the general Analysis Report was automatically generated by using the 'Visualisation' function through selecting relevant keywords, which involved judicial analysis of the film and entertainment industry.⁴⁴ The Beijing Internet Court concluded that Analysis Report satisfied formal requirements of written works, showing selection, judgment, and analysis of relevant data, and therefore it had a certain degree of originality.

3.1.2. Being created by human beings

With the development of technology, outputs intelligently generated by computer software are gradually close to those created by human beings.⁴⁵ However, the Beijing Internet Court considered according to the current regulations, being original was not the sufficient condition of constituting a written work, it must be created by natural persons.

There were two processes involving participation of natural persons in the generating process of Analysis Report-the development of software and the use of software. However, the Beijing Internet Court considered neither the developer (or owner) nor the user of software created such a report because the report did not convey original expressions of their thoughts or feelings. The developer (or owner) of software did not input keywords for search based on the needs, whereas the user of software only submitted keywords for search and Analysis Report was automatically generated through 'Visualisation' function.⁴⁶

In the view of the Beijing Internet Court, it was improper to break the basic principles of subject in civil law if the intellectual and economic investment of such software could be protected within the current legal system.

⁴¹ The right of communication through the information network in China is similar to the right of making available in the European Union.

⁴² The plaintiff also claimed that the right of authorship and the right of integrity were infringed by the defendant.

⁴³ *Film* (n 8). In this case, the court ordered the defendant to compensate the plaintiff in the amount of ¥1,560.

⁴⁴ *Ibid.*

⁴⁵ *Ibid.*

⁴⁶ *Ibid.*

3.1.3. Authorship

Since neither the developer (or owner) nor the user of software created Analysis Report, the author of such report was not them. Analysis Report was produced by Wolters Kluwer Legal Database by using the combination of input keywords, algorithms, rules and templates, the Beijing Internet Court therefore believed that in a sense, it can be recognised that Wolters Kluwer Legal Database 'created' the report. However, since the subject creates original Analysis Report was not natural persons, the report cannot be granted copyright protection.⁴⁷

It is interesting to note that the Beijing Internet court further ruled the logo of software which generated the report should be incorporated into Analysis Report to indicate that the report was automatically generated by software, with the consideration of the right to be informed of the public, maintaining good faith of the society and being conducive to cultural dissemination.

3.1.4. Approach to protecting AI-generated outputs

Analysis Report involved efforts of the developer (or owner) and the user of software, it had value of communication. Hence, the Beijing Internet Court confirmed that Analysis Report was not in public domain and could not be freely used by the public, although it was not eligible for copyright protection. Without protecting rights and interests of investor, the communication of Analysis Report will be adversely influenced, and the report cannot achieve its effectiveness.⁴⁸

After confirming that Analysis Report should be legally protected, the Beijing Internet Court further discussed which subject should enjoy such rights and interests. Compared with the developer (or owner) of software, the user of software who invested by paid-for-use and set keywords based on the needs to generate Analysis Report is more motivated to further use and spread the report, because the developer (or owner) of software can get remuneration for their investment through charging fees of software licenses and other manners.⁴⁹ Thus, from the perspective of encouraging the user of software to use and communicate the outputs generated by computer software, the court held that relevant rights and interests of Analysis Report should be awarded to the user of software. Otherwise, the amount of software user will decrease, and they will be unwilling to further communicate the report, eventually the cultural communication and value exertion will be hindered. However, the Beijing Internet Court did not clear which kind of rights and interests should be granted to the user of software.

3.2. The Tencent case

Since 2015, the plaintiff-Shenzhen Tencent Computer System Co Ltd (Tencent Company), has managed its creative staff to use an intelligent writing assistant named Dreamwriter which was developed by its affiliate company. On 20 August 2018, Tencent Company first published a financial review titled 'Noon Review: The Index of Shanghai Stock Increased Slightly by 0.11% to 2671.93 Points, Led by Sectors

⁴⁷ *Ibid.*

⁴⁸ *Ibid.*

⁴⁹ *Ibid.*

Such as Communication Operation and Petroleum Extraction' (Stock Noon Review), which was automatically generated by Dreamwriter, on the Tencent Securities website. Tencent Company attached '[t]his article was automatically written by the Tencent robot Dreamwriter' at the end of the Stock Noon Review to indicate that such an article was the work of legal person belonged to the plaintiff. On the same day the Stock Noon Review was published, the review was issued without the plaintiff's permission by the defendant-Shanghai Yingxun Technology Co Ltd (Yingxun Company) on the 'Internet Loan House' ('Wangdaizhijia') website operated by the defendant. Claiming that the behavior of Yingxun Company infringed its right of communication through the information network and constituted unfair competition, Tencent Company sued Yingxun Company to the Nanshan District Court of Shenzhen.

On 24 December 2019, the Nanshan District Court of Shenzhen released the decision which partly in favor of the plaintiff, confirming the Stock Noon Review was a work of legal person owned by the plaintiff and the right of communication through the information network of the plaintiff was infringed.⁵⁰ In this decision, the Nanshan District Court of Shenzhen approved copyright protection for article automatically generated by Dreamwriter.

3.2.1. Originality

Article 4(1) of the Regulation for the Implementation of the Copyright Law of China stipulates that written works are works expressed in written form, such as novels, poems, essays and theses. The Stock Noon Review is a review article regarding stock market, which belongs to the expression of literary domain and has reproducibility, the Nanshan District Court of Shenzhen therefore considered that the pivotal question was whether the Stock Noon Review possessed originality when determining whether the review constituted a written work.

To determine the originality of the Stock Noon Review, the Nanshan District Court of Shenzhen held that it should examine whether the review was independently created, and whether it had a certain degree of difference in external performance compared with existing works or had the lowest degree of creativity. The court considered that the Stock Noon Review was generated by the staff of creative team of the plaintiff by using Dreamwriter, and its external performance satisfied the formal requirements of written works. Contents of the review which had rational structure and clear logic expression showed the selection, analysis and judgment about information and data of the relevant stock market, the court therefore approved that the Stock Noon Review had a certain degree of originality.

3.2.2. Being created by human beings

The Nanshan District Court of Shenzhen further analysed whether the Stock Noon Review showed the creator's personal selection, judgment, skill and other factors from the perspective of the generating process. By dividing the producing process of the review into four steps-data service, triggering

and writing, intelligent verification, and intelligent distribution, the court considered that the staff of the creative team selected and arranged the input of data's type, the processing of data's format, the setting of the condition of trigger, the selection of frame template of article, the setting of corpus and the training of model of intelligent verification algorithm, etc.

The behaviour of creation in the Copyright Law of China refers to intellectual activities in which literary, artistic or scientific works are directly produced.⁵¹ The Nanshan District Court of Shenzhen considered the selection and arrangement in the input of data, the setting of conditions of trigger, and the choice of template and corpus made by the creative team of the plaintiff were intellectual activities which had direct connection with the specific expression of the Stock Noon Review, and therefore such selection and arrangement should be incorporated into the creation process of the Stock Noon Review.

The difference in generating process between the Stock Noon Review and an ordinary written work was that there was a certain time gap between the actual writing of the Stock Noon Review and relevant selection and arrangement made by the creative team of the plaintiff.⁵² The court further pointed out that such lack of synchronization was determined by the technical path or the characteristics of the tools used by the plaintiff. If only regarding the two minutes in which the Stock Noon Review was automatically generated by Dreamwriter software as the process of creation, there is indeed no participation of human beings and it is merely the result of established rules, algorithms and templates.⁵³ The Nanshan District Court considered, however, automatic operation of Dreamwriter software was not unfounded or self-conscious, instead it reflected the selection of the plaintiff, which was also determined by the characteristics of technology of Dreamwriter software itself. If merely regarding the automatic operation of Dreamwriter software as the process of creation, computer software would be regarded as the subject of creation in a sense, which was inconsistent with objective situations and unfair.⁵⁴ Hence, the court concluded that the expression of the review which was original and not the unique method of expression of the idea was determined by the personal selection and arrangement of the relevant staff of the plaintiff's creative team.

3.2.3. Authorship and ownership

The affiliate company of the plaintiff who developed and owned the copyright of Dreamwriter software had agreed that the copyright of work generated by the licensed software owned by the plaintiff. Hence, the Nanshan District Court of Shenzhen considered that there was no need to assess whether the relevant works of the developer of Dreamwriter software had direct connection with the originality of the Stock Noon Review.

Article 11(3) of the 2010 Copyright Law of China regulates that legal entity or another organisation is regarded as the author of a work where the work is created according to the

⁵⁰ Tencent (n 10). In this case, the court ordered the defendant to compensate the plaintiff in the amount of ¥1500.

⁵¹ Regulation for the Implementation of the Copyright Law of China, art 3(1).

⁵² Tencent (n 10).

⁵³ Ibid.

⁵⁴ Ibid.

intention and under the host and responsibility of the legal entity or another organisation. The Stock Noon Review was hosted by the plaintiff and completed by the plaintiff's creative team which including editing team, product team and technology development team, by using Dreamwriter software, which showed the needs and intentions of the plaintiff of publishing stock market reviews.⁵⁵ Hence, the Nanshan District Court of Shenzhen concluded that the Stock Noon Review was a work of legal person created under the host of the plaintiff, and the copyright in the review belonged to the plaintiff.

4. Copyright protection for AI-generated outputs after *Film* and *Tencent*

For years, the issue of copyright protection for AI-generated outputs has stood high on the political agenda around the world, causing one of the most complicated, controversial, and stimulating debates in modern copyright law. The biggest challenge faced by copyright protection of AI-generated outputs in most jurisdictions is the existing human-centered copyright law framework. The United States Copyright Office clearly requires that copyrightable works must be created by human beings.⁵⁶ Copyright does not exist in a work generated by computer which is not the result of human authorship has also been confirmed in a case in Australia.⁵⁷ Thus, the phone number arranged by numbers is not an intellectual achievement;⁵⁸ a photo taken by a monkey is not copyrightable;⁵⁹ natural scenery is not the work in copyright law.⁶⁰ Some jurisdictions provide provisions regarding the computer-generated works without human authors,⁶¹ but it does not mean AI-generated outputs can be granted copyright protection undoubtably. Other important issues like originality remains unsolved.⁶²

Most of discussions associated with copyright protection of AI-generated outputs have not been decided in court.⁶³ *Film*

and *Tencent* have significant influence nationally and internationally because the two cases showed valuable judicial opinion and approach in relation to this complex issue. In this sense, the two cases give some enlightenments for copyright protection of AI-generated outputs in future.

4.1. Objective approach to assessing originality

To be original is a 'pervading prerequisite' for copyright protection.⁶⁴ From 'skill, judgment or labour'⁶⁵ to 'some imprint of the author's personality',⁶⁶ from 'author's own intellectual creation'⁶⁷ to 'some independent intellectual effort',⁶⁸ the standard for originality is evolving and varies in different jurisdictions. There is no internationally accepted definition of originality either,⁶⁹ but originality inquiry develops towards an objective approach.⁷⁰

Both the Beijing Internet Court and the Nanshan District Court of Shenzhen adopted such an objective approach to evaluate originality. Compared with some opinions believe that AI-generated outputs cannot be original,⁷¹ the two courts approved the originality of the respective outputs automatically generated by computer software. In *Film*, the Beijing Internet Court held that the report automatically generated by the 'Visualisation' function with selecting relevant keywords satisfied the formal requirements of written works and its content showed selection, judgment, and analysis of relevant data.⁷² In *Tencent*, the Nanshan District Court of Shenzhen confirmed the originality of the Stock Noon Review based on similar reason. The Nanshan District Court of Shenzhen analysed whether the relative output was independently created and whether there was a certain degree of difference in its external performance from existing works or existed the lowest degree of creativity, stating that the review which generated by the staff of the plaintiff using Dreamwriter software satisfied the formal requirements of written works and its content displayed the selection, analysis and judgment of the relevant information and data of the stock market.⁷³

⁵⁵ Ibid.

⁵⁶ United States Copyright Office, *Compendium of US Copyright Office Practices* (3rd edn, 2021) Section 313.2.

⁵⁷ *Telstra Corporation Limited v Phone Directories Company Pty Ltd* [2010] FCA 44, [5].

⁵⁸ See *Zeng Taiping v Post and Telecommunications Bureau of Loudi District, Hunan Province* (1996) Lou Zhong Jing Zhong Zi No 109 (Intermediate Court of Loudi District).

⁵⁹ United States Copyright Office (n 56).

⁶⁰ Wang, *Copyright Law* (n 37).

⁶¹ See eg Copyright, Designs and Patents Act 1988 s 9(3) (UK); Copyright Act 1994 s 5(2)(a) (NZ); The Copyright Act, 1957 s 2(d)(vi) (India).

⁶² Lionel Bently, 'The UK's Provisions on Computer-Generated Works: A Solution for AI Creations?' (International Conference on EU Copyright, quo vadis? From the EU Copyright Package to the Challenges of Artificial Intelligence, Brussels, 25 May 2018) <<http://copyrightblog.kluweriplaw.com/2018/09/25/singularity-copyright-challenges-artificial-intelligence/%3E>> accessed 30 June 2021.

⁶³ See eg Andres Guadamuz, 'Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works' in Jyh-An Lee, Reto M Hilty and Kung-Chung Liu (eds), *Artificial Intelligence and Intellectual Property* (OUP 2021) 148 (stating that most of the examples discussed in the chapter 'have not made it to court').

⁶⁴ See Melville B Nimmer and David Nimmer, *Nimmer on Copyright*, vol 1 (Rev edn, Matthew Bender 2021) Section 2.01.

⁶⁵ *Ladbroke (Football) v William Hill (Football) Ltd* [1964] 1 All ER 465, 469.

⁶⁶ Goldstein and Hugenholtz (n 15) 177.

⁶⁷ Case C-5/08 *Infopaq International A/S v Danske Dagblades Forening* [2009] ECR I-06569, para 37.

⁶⁸ See eg *Sands & McDougall Pty Ltd v Robinson* (1917) 23 CLR 49, 52 (Isaacs J) (*Sands*); *IceTV Pty Limited v Nine Network Australia Pty Limited* [2009] HCA 14, [33] (French CJ, Crennan and Kiefel JJ) (*IceTV*).

⁶⁹ Shlomit Yanisky-Ravid and Luis Antonio Velez-Hernandez, 'Copyrightability of Artworks Produced by Creative Robots and Originality: The Formality-Objective Model' (2018) 19 Minn JL Sci & Tech 1, 19.

⁷⁰ See European Parliament Committee on Legal Affairs, *Report on Intellectual Property Rights for the Development of Artificial Intelligence Technologies* (2020/2015(INI)) 13.

⁷¹ See eg Xiang Luo and Guoan Zhang, 'The Protection of Artificial Intelligence Creations from the Perspective of Copyright Law' (2017) 32 Journal of Henan University of Economics and Law 144, 145 (stating that 'the judgment of originality essentially based on the existence of a human being in the physiological sense').

⁷² *Film* (n 8).

⁷³ *Tencent* (n 10).

It is worth noting that the Nanshan District Court of Shenzhen also examined whether the producing process of the Stock Noon Review showed the creator's personal selection, judgment, skill and other factors.⁷⁴ It seems that the Nanshan District Court of Shenzhen assessed extra threshold for originality than the Beijing Internet Court, but the Nanshan District Court of Shenzhen did not adopt higher standard for originality. When discussing whether there existed the creator's personal selection, judgment, skill and other factors, the main question analysed by the Nanshan District Court of Shenzhen was whether the Stock Noon Review was created by the staff of Tencent Company.⁷⁵

Although some aspects of the copyright law system in China reflect influence of the *droit d'auteur* tradition, the Copyright Law of China adopts the utilitarian theory⁷⁶ which can be seen from Article 1 of the Copyright Law of China.⁷⁷ Whether the standard for originality in China should keep consistent with the civil law system needs to be considered carefully.⁷⁸ Based on the utilitarian justification, the threshold for originality should be explained in line with the objective of the Copyright Law of China, which resembles the standard in common law countries. The approach to assessing originality that the expression of the work should be completed independently and show creativity⁷⁹ is similar with the standard established in some common law jurisdictions. For example, in *Feist Publications Inc v Rural Telephone Service Co Inc*, the Supreme Court of the United States ruled that originality existed where the selection or arrangement independently made by the author, and it possessed some minimal degree of creativity.⁸⁰

AI-generated outputs are denied for copyright protection mainly based on the perspective of subject. This may because author is usually the 'starting point and central focus' regarding the discussions in copyright law,⁸¹ and originality is correlated with authorship.⁸² Compared with the debates about whether AI can be author under copyright law, whether AI-generated outputs possess originality is usually not answered in detail.⁸³ However, it may be wrong to start with considering whether AI can be author of a work in the context of subsistence of copyright.⁸⁴ In *Film* and *Tencent*, the two courts not only detailed the originality issue, also addressed such a point

in the first place before considering whether the outputs were created by human beings.⁸⁵ By assessing originality the very first, the two courts avoided falling into a logical dilemma-AI is not a human being and therefore AI-generated outputs are not works in copyright; since AI-generated outputs are not works, there is no author or no need to determine other factors like authorship or ownership.⁸⁶ The approach which determines the originality of AI-generated outputs at first highlights the importance of AI in creative process and the value of AI-generated outputs. When the Beijing Internet Court and the Nanshan District Court of Shenzhen approved the originality of relevant AI-generated outputs, the two courts adopted an objective approach without the consideration of involved human intelligence, which means that human intervention or human authorship is not considered in evaluating originality. Thus, *Film* and *Tencent* show that being automatically generated by AI does not constitute a barrier to approving originality of AI-generated outputs. In other words, AI-generated outputs are not inherently lacking originality. Hence, as long as the AI-generated output is completed independently and shows the lowest degree of creativity which displays selection, analysis and judgment of relevant contents, it has a certain degree of originality under the copyright law system in China.

4.2. Sufficient human intervention

When discussing copyright protection of AI-generated outputs, it is important to determine the role played by AI in creation process. Different opinions associated with the influence of AI in generating outputs lead to different conclusions regarding copyright protection of AI-generated outputs. Different forms of software complete tasks ranged from inconsiderable to essential.⁸⁷ Basically, the more intelligent and autonomous the AI is, the more important it is in the process of creation.

It is interesting to note that the Beijing Internet Court explicitly stated that being created by natural persons was a prerequisite of copyright protection,⁸⁸ while the Nanshan District Court of Shenzhen did not clearly mention such a precondition.⁸⁹ The Beijing Internet Court held Analysis Report was 'created' by Wolters Kluwer Legal Database, neither the developer (or owner) nor user of software conveyed original expressions of their thoughts or feelings.⁹⁰ Based on the different facts, the Nanshan District Court of Shenzhen held that computer software was not the subject of creation in the case of the Stock Noon Review because the form of expression of the review is determined by the selection and arrangement of the staff of Tencent Company.⁹¹

It can be seen that being created by human beings is still a vital condition for copyright protection of AI-generated out-

⁷⁴ Ibid.

⁷⁵ Ibid.

⁷⁶ Cui (n 18).

⁷⁷ See n 19.

⁷⁸ Jinchuan Chen, 'The Two Non-Negligible Factors in Determining Standard for "Originality"' (2018) 6 China Copyright 26, 28.

⁷⁹ 2002 Interpretation of the Supreme People's Court Concerning the Application of Laws in the Trial of Civil Disputes over Copyright, art 15.

⁸⁰ *Feist Publications Inc v Rural Telephone Service Co Inc* 499 US 340, 358 (1991).

⁸¹ Avishek Chakraborty, 'Authorship of AI Generated Works under the Copyright Act, 1957: An Analytical Study' (2019) 8 Nirma U LJ 37, 44.

⁸² See 17 USC §102(a) (US). See also *Sands* (n 68) 55; *IceTV* (n 68) [34].

⁸³ See Jiming Yi, 'Are Artificial Intelligence Created Contents Works?' (2017) 35 Science of Law (Northwest University of Political & Law) 137, 138.

⁸⁴ See Robert C Denicola, 'Ex Machina: Copyright Protection for Computer Generated Works' (2016) 69 Rutgers UL Rev 251, 270.

⁸⁵ *Film* (n 8); *Tencent* (n 10).

⁸⁶ See Qian Wang, 'Qualitative Research on the Content Generated by Artificial Intelligence in Copyright Law' (2017) 35 Science of Law (Northwest University of Political & Law) 148, 150.

⁸⁷ See *Telstra Corporation Limited v Phone Directories Company Pty Ltd* [2010] FCAFC 149, [118] (Perram JJ).

⁸⁸ *Film* (n 8).

⁸⁹ *Tencent* (n 10).

⁹⁰ *Film* (n 8).

⁹¹ *Tencent* (n 10).

puts, especially for those have been recognised as original, although such a requirement is not explicitly stated in the Copyright Law of China. The United States Copyright Office also indicates that in the absence of a human author's creative input or intervention, works automatically generated by a machine cannot be registered.⁹² Since AI-generated outputs without human intervention cannot not gain copyright protection,⁹³ the crucial question need to be answered is what level of human intervention is sufficient for AI-generated outputs to obtain copyright protection. The decisions of *Film* and *Tencent* provided such a criterion.

In the case of *Analysis Report* in *Film*, the developer (or owner) of software did not input the keywords, while the user of software merely input the keywords. The Beijing Internet Court considered neither the developer (or owner) nor the user created *Analysis Report*, rather the report was 'created' by Wolters Kluwer Legal Database.⁹⁴ It can be inferred that there lacked sufficient human intervention in the process of generating *Analysis Report*. Scilicet, developing software without inputting keywords or only inputting keywords cannot be sufficient human intervention to support AI-generated outputs in being protected as works in copyright law. Regarding the *Stock Noon Review*, the Nanshan District Court of Shenzhen held that the selection and arrangement made by the staff of the plaintiff satisfied the requirement of 'creation' under the Copyright Law of China.⁹⁵ Therefore, advanced selection and arrangement as what has done by Tencent Company, such as the input of the type of data, the setting of conditions of trigger and the choice of template and corpus, are adequate human intervention to support AI-generated outputs in gaining copyright protection.

The Beijing Internet Court and the Nanshan District Court of Shenzhen reached different conclusions in *Film* and *Tencent* is reasonable because the types of AI involved in the two cases are different. The Wolters Kluwer Legal Database in *Film* is more like a well-developed type of software provided for uncertain users, which means that any user like *Film Law Firm* who has the access to the software can generate *Analysis Report* by inputting several keywords or setting some preferences. However, *Dreamwriter* in *Tencent*, as an intelligent writing computer software, needs user get involved in several processes in advance, such as input of data's type, setting the condition of trigger, setting corpus and training model of the intelligent verification algorithm, which means that the user like Tencent Company cannot generate similar article as the *Stock Noon Review* by easily making some choices on the website or inputting several keywords. The *Analysis Report* generated by Wolters Kluwer Legal Database clearly also need the same processes being completed as *Dreamwriter*, for example the se-

lection of frame template of article and the training of model of the intelligent verification algorithm. Such steps have been completed by the developer of Wolters Kluwer Legal Database before it is put on the market and provided for mass users like *Film Law Firm*. Thus, from the user's perspective, the degree of human intervention involved in producing process of the outputs generated by *Dreamwriter* is higher than in those generated by Wolters Kluwer Legal Database.

4.3. Identifying human author and ownership

Authorship is one of the biggest impediments to copyright protection for AI-generated outputs.⁹⁶ Copyright protection for a work always requires a recognised human author, also human authorship.⁹⁷ Similar obstacle also commonly exists in copyright protection for contents produced by non-human subjects and even patent protection for AI-generated inventions. In a case in relation to copyright protection for a photograph taken by a monkey, the United States Court of Appeals for the Ninth Circuit held that animals were non-human, and therefore could not sue under the Copyright Act due to lacking the statutory standing.⁹⁸ Regarding two patent applications designating a machine as inventor, the European Patent Office refused the applications because only natural persons could be referenced for inventorship in a European patent.⁹⁹

The decisions of *Film* and *Tencent* did not rule beyond the requirement of human authorship. On the one hand, there was no claim regarding computer software was the author of the outputs in the two cases. On the other hand, the two courts tried to identify human authors of AI-generated outputs. The Beijing Internet Court denied copyright protection for *Analysis Report* because neither the developer nor the user of software was the author.¹⁰⁰ The Nanshan District Court of Shenzhen considered that the producing of the *Stock Noon Review* was the result of the intelligent activities of the Tencent Company's staff, although there was no human activity involved in the short time when *Dreamwriter* generated the output.¹⁰¹

The extensive use of AI not only challenges the copyright law regime, also has raised a series of debates in other legal fields, such as healthcare¹⁰² and privacy protection.¹⁰³ As stated by the Beijing Internet Court in *Film*, it is inappropriate

⁹⁶ See Nina I Brown, 'Artificial Authors: A Case for Copyright in Computer-Generated Works' (2018) 20 Colum Sci & Tech L Rev 1, 27.

⁹⁷ See Denicola (n 84) 286.

⁹⁸ *Naruto v Slater* 888 F3d 418, 426 (9th Cir 2018).

⁹⁹ See Grounds for the EPO decision of 27 January 2020 on EP 18275163 on <<https://register.epo.org/application?documentId=E4B63SD62191498&number=EP18275163&lng=en&npl=false%3E>> accessed 30 June 2021; Grounds for EPO decision of 27 January 2020 on EP 18275174 on <<https://register.epo.org/application?documentId=E4B63OBI2076498&number=EP18275174&lng=en&npl=false%3E>> accessed 30 June 2021.

¹⁰⁰ *Film* (n 8).

¹⁰¹ *Tencent* (n 10).

¹⁰² See eg Ivan Khoo Yi and Andrew Fang Hao Sen, 'The Rise and Application of Artificial Intelligence in Healthcare' in Lee, Hilty and Liu (eds) (n 63) 28-49.

¹⁰³ See eg Charlotte A Tschider, 'Regulating the Internet of Things: Discrimination, Privacy, and Cybersecurity in the Artificial Intelligence Age' (2018) 96 Denv L Rev 87, 87-143.

⁹² United States Copyright Office (n 56).

⁹³ AIPPI, 'Resolution' (AIPPI, 18 September 2019) <https://aippi.org/wp-content/uploads/2020/05/Resolution_Copyright_in_artificially_generated_works_English-1.pdf%3E> accessed 30 June 2021.

⁹⁴ *Film* (n 8).

⁹⁵ *Tencent* (n 10).

ate to rule beyond the basic norms of subjects in civil law.¹⁰⁴ The question that whether the law should confirm the legal personhood of AI is not the unique issue in copyright law. It is more proper to reform copyright law in accordance with other legal fields, especially the civil law. At this stage, there is no completely autonomous creation by AI, and therefore AI is still a tool of human beings in the process of creation.¹⁰⁵ Hence, compared with confirming AI's authorship, identifying the human author behind the automatic operation of AI system is a more effective and direct approach to solving problems brought by copyright protection for AI-generated outputs.¹⁰⁶

Regarding the subject who should own copyright of the outputs generated by computer software, copyright is expressly granted to the person who make the arrangement necessary for the creation of the computer-generated work in some jurisdictions, such as the United Kingdom,¹⁰⁷ New Zealand¹⁰⁸ and Ireland.¹⁰⁹ There is no identical regulation under the Copyright Law of China. However, the two courts in *Film* and *Tencent* reached same conclusion that copyright or interests of computer-generated outputs should be assigned to the user, rather than the developer of software. It is interesting to note that the opinion that the user should own copyright or enjoy interests is opposed to the major view relating to allocation of copyright of computer-generated outputs. Since the programmer is 'the author of the author of the works',¹¹⁰ the majority opinion considers the computer programmer should be the author.¹¹¹ However, simply recognising programmer as author ignores the complicated issues attaching to authorship in the modern computing era,¹¹² and may cause the developer of software be over-rewarded.¹¹³

Since Tencent Company-the user of Dreamwriter-had agreed with the developer of software that the copyright of works generated by Dreamwriter belonged to Tencent Company, the Nanshan District Court of Shenzhen confirmed the user should be copyright owner and did not analyse whether the developer should own the copyright.¹¹⁴ In the case as Analysis Report generated by Wolters Kluwer Legal Database without an agreement regarding ownership in advance, the generation process involves respective contributions of differ-

ent stakeholders. It is hard to trace the most necessary human intervention attaching to the outputs. This may be the reason why there is another opinion considers it is 'a case of joint authorship'.¹¹⁵ Although there is no similar provision about computer-generated outputs under the Copyright Law of China as the counterpart in the United Kingdom, the discussions of the Beijing Internet Court about this issue are in accordance with the legal theory in the legal system of China. On the one hand, the user is more motivated and important in commercialisation of the outputs.¹¹⁶ If the copyright or interests are allocated to the developer of software, the invest and effort of the user will not be paid off, whereas the developer of software has been rewarded by licensing software in advance. The Copyright Law of China encourages the creation and dissemination of works.¹¹⁷ As stated by the Beijing Internet Court, if granting all rights and interests to the developer, the user would be less motivated to generate outputs, the generation and dissemination of outputs would therefore be adversely influenced.¹¹⁸ Furthermore, the relationship between the developer and the user of software bears some resemblance to allocation of *fructus naturales* in property law. Under Article 321 of the Civil Code of the People's Republic of China,¹¹⁹ *fructus naturales* shall be obtained by the owner, but if there are both the owner and the usufructuary, *fructus naturales* shall be obtained by the usufructuary. The legal rules in property law cannot be applied to the context of copyright law, but it can provide some enlightenments regarding the allocation of rights between the original owner of property and the subject who enjoy the rights to use and profit.

4.4. The valuable judicial experience of China and its limitation

Several solutions in relation to copyright protection for AI-generated outputs, such as adopting the own computer-generated work provision in the United Kingdom¹²⁰ and using work made for hire doctrine,¹²¹ have been discussed and provided. Beyond theoretical discussions, court in China is the first to judicially provide AI-generated outputs with copyright protection.¹²² Although copyright protection for AI-generated outputs is determined on a case-by-case basis and different

¹⁰⁴ *Film* (n 8).

¹⁰⁵ See The Joint Institute for Innovation Policy and IViR-University of Amsterdam, *Trends and Developments in Artificial Intelligence: Challenges to the Intellectual Property Rights Framework* (Publications Office of the European Union 2020) 116.

¹⁰⁶ See Jane C Ginsburg and Luke Ali Budiardjo, 'Authors and Machines' (2019) 34 *Berkeley Tech LJ* 343, 350.

¹⁰⁷ Copyright, Designs and Patents Act 1988 s 9(3) (UK).

¹⁰⁸ Copyright Act 1994 s 5(2)(a) (NZ).

¹⁰⁹ Copyright and Related Rights Act, 2000 s 21 (f) (Ireland).

¹¹⁰ Annemarie Bridy, 'Coding Creativity: Copyright and the Artificially Intelligent Author' (2012) 2012 *Stan Tech L Rev* 5, 21.

¹¹¹ Peter K Yu, 'Data Producer's Right and the Protection of Machine-Generated Data' (2019) 93 *Tul L Rev* 859, 904; Jyh-An Lee, 'Computer-generated Works under the CDPA 1988' in Lee, Hilty and Liu (eds) (n 63) 187.

¹¹² Bridy (n 110) 25.

¹¹³ Lee, 'Computer-generated Works under the CDPA 1988' (n 111) 190; Pamela Samuelson, 'Allocating Ownership Rights in Computer-Generated Works' (1986) 47 *U Pitt L Rev* 1185, 1208.

¹¹⁴ *Tencent* (n 10).

¹¹⁵ William Cornish, David Llewelyn and Tanya Aplin, *Intellectual Property: Patents, Copyright, Trademarks and Allied Rights* (9th edn, Sweet & Maxwell 2019) 864 (stating that '[a]s between the provider of a database (such as Lexis) and a user who extracts information from it, who undertakes the arrangements for creation? Perhaps this is a case of joint authorship').

¹¹⁶ Samuelson (n 113) 1203.

¹¹⁷ See n 19.

¹¹⁸ *Film* (n 8).

¹¹⁹ The Civil Code of the People's Republic of China entered into force on 1 January 2021.

¹²⁰ See Guadamuz, 'Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works' (n 63) 176 (suggesting that 'the UK's own computer-generated work clause contained in section 9(3) CDPA that should be adopted more widely').

¹²¹ See Bridy (n 110) 25-27.

¹²² Guadamuz, 'Do Androids Dream of Electric Copyright? Comparative Analysis of Originality in Artificial Intelligence Generated Works' (n 63) 171.

jurisdictions have their specific regulations, traditions and dilemmas, the decisions of *Film* and *Tencent* provide unique judicial experience and show that the contradiction between the copyright protection of AI-generated outputs and the existing copyright law framework is not impossible to reconcile.

First, AI-generated outputs are not inherently lack originality. When deciding the originality issue, it is better to adopt the objective approach. Automatic operation of AI in creative process should not be a barrier to recognition of originality. Such an objective approach is also in line with the development trend.¹²³ By adopting the objective approach, the copyright protection for AI-generated outputs avoids the dilemma of machine authorship at the beginning.

Secondly, human intervention is still a requirement for copyright protection. The point is to determine whether there exists adequate human intervention. Developing AI software without inputting keywords or merely inputting keywords for producing AI-generated outputs cannot constitute enough human intervention, whereas advanced selection and arrangement, such as input of the type of data, setting of conditions of trigger, and the choice of template and corpus, can be sufficient human intervention to qualify AI-generated outputs in gaining copyright protection. Assessing human intervention is not limited within the exact short time when the outputs are generating, the selection and arrangement made by human beings in advance also should be incorporated in the creation process of the outputs. Being automatically and intelligently generated by AI should not prevent the outputs from copyright protection.

Thirdly, if there is the agreement regarding the ownership of copyright or the allocation of other legal interests, determination of the ownership should be in accordance with the agreement. In the case like *Wolters Kluwer Legal Database* without agreement in advance, the user should be granted rights or interests on AI-generated outputs, rather than the developer of AI software.

Finally, not all AI-generated outputs can be protected by copyright law. Even if some of the outputs are not qualified for copyright protection, the rights and interests on them which belonged to the user of software should be protected. For AI-generated outputs which are not copyrightable, the logo of software should be incorporated into the outputs to indicate that they are automatically generated by software.

However, the influence of the two cases also has limitations. The two cases provide experience within the existing copyright law regime, but the type of AI involved in the two cases is not the category with self-awareness. The approach adopted by the two courts may not be able to solve the issue associated with copyright protection of outputs generated by the type of AI which is more intelligent than *Wolters Kluwer Legal Database* and *Dreamwriter*. Furthermore, regarding the AI-generated outputs which cannot gain copyright protection, the Beijing Internet Court cleared that they should gain legal protection,¹²⁴ but what kind of legal protection can be provided needs further clarification.

5. Conclusion

Facing the emergence of AI-generated outputs, the copyright legislations in various jurisdictions always lag behind the development of technology, whereas the legal practices are more active and flexible.¹²⁵ Providing valuable judicial experience in copyright protection for AI-generated outputs nationally and internationally, *Film* and *Tencent* were decided by the two courts based on the existing legal doctrines. The two cases show that, to some extent, the issue of copyright protection for AI-generated outputs can be solved under the current human-centered copyright realm. The two cases provide a detailed scheme for copyright protection of AI-generated outputs, including the standard of originality, the degree of human intervention, authorship and ownership.

In the Global Innovation Index 2020, China ranked 14th and is the only middle-income economy in the top 30.¹²⁶ With the development of intellectual property law system in China, there are more and more cases in intellectual property realm emerged in China. In 2020, the amount of intellectual property related cases concluded in China was 524,387, with an increase of 10.2% over 2019.¹²⁷ Simultaneously, more and more first cases in new fields of intellectual property law are decided in China, *Film* and *Tencent* included, which shows that on the one hand courts in China play a creative role in determining new issues caused by the evolving technology, and more judicial experience of China can be provided internationally on the other hand. This is consistent with national policy of China to strengthening the protection of intellectual property rights and will also be helpful for harmonisation in international copyright protection for AI-generated outputs.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

This paper acknowledges the support of the Beijing Philosophy and Social Sciences Foundation (Project No. 20FXA005).

¹²³ See European Parliament Committee on Legal Affairs (n 70).

¹²⁴ *Film* (n 8).

¹²⁵ Handong Wu, 'Rethinking the Copyright of Works Generated by Artificial Intelligence' (2020) 32 *Peking University Law Journal* 653, 671.

¹²⁶ Cornell University, INSEAD and WIPO, *The Global Innovation Index 2020: Who Will Finance Innovation?* (2020) 19.

¹²⁷ Wenxin Qiao, Bo Zhou and Changhai Xu, 'The Supreme Court of China Holds a Press Conference for Intellectual Property Publicity Week: Issued the "People's Court Intellectual Property Judicial Protection Plan (2021-2025)"' *People's Court Daily* (Beijing, 23 April 2021) 1.