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Research on the Application of Artificial Intelligence in Fact-Finding

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Abstract. Due to the widespread application of information technologies such as artificial intelligence in various sectors of society and the continuous construction of intelligent court systems, the judicial field has naturally been influenced by artificial intelligence technology. However, in the realm of fact-finding, there are issues such as the impact of artificial intelligence on the status of judges and the lack of specific application norms. The application of artificial intelligence in fact-finding is irreversible, and the public is gradually developing trust in artificial intelligence. Therefore, it is necessary to establish the positioning of artificial intelligence assisted fact-finding, clarify the principles of application of artificial intelligence in the field of fact-finding, in order to regulate the behavior of artificial intelligence in the field, and utilize judicial data to assist artificial intelligence in a deeper level of application.

1. Introduction
In recent years, the Supreme People's Court of the People's Republic of China has mentioned in several documents the need to strengthen the application of big data, blockchain, artificial intelligence and other technologies in the field of judicial adjudication, in order to improve the efficiency of litigation and allow the people to feel fairness and justice in every judicial case. In 2017, the *Opinions of the Supreme People's Court on Accelerating the Construction of Intelligent Courts* guided the construction of intelligent court platforms at all levels of the courts to utilize big data for judicial decision-making, and promote the modernization of the trial system and trial capacity with informatization. In 2020, Article 28 of the *Implementation Opinions on Deepening Comprehensive Supporting Reforms for the Judicial Responsibility System* issued by the Supreme People's Court stated: "Strengthen the construction of the intelligent data center. Higher People's Courts should leverage the development of smart courts to vigorously advance the application of blockchain technology in courts under their jurisdiction, actively explore the in-depth application of smart contracts, and enhance the construction of a smart data middle platform based on the judicial big data management and service platform. People's Courts at all levels should further explore and expand the application of

modern technologies such as artificial intelligence and 5G in judicial work. "This document serves as guidance for Higher People's Courts to strengthen the construction of smart court platforms, vigorously promote the application of blockchain technology in courts under their jurisdiction, and encourage People's Courts at all levels to explore the use of artificial intelligence technology in adjudication. As artificial intelligence is widely used in judicial activities, it will inevitably affect the fact-finding behavior of judges to a certain extent and have an impact on the fact-finding results, so it is also necessary to regulate the application of artificial intelligence technology in the field of fact-finding and standardize its application in the judicial field.

2. Current status and issues in the application of artificial intelligence in the field of fact-finding

2.1. State of the artificial intelligence in the field of fact-finding

Accompanied by the deep integration of artificial intelligence technology and judicial trial, Chinese people's courts at all levels are also actively building artificial intelligence judicial system, artificial intelligence technology has been gradually applied to the process of evidence reasoning and factual determination of the case. Such as the Supreme People's Court of the People's Republic of China jointly with the Beijing Municipal Higher People's Court launched the "Rui Judge" intelligent research and adjudication system, the Guangzhou Baiyun District People's Court to establish the "six wisdom and a center" intelligent court system and so on, of which the most prominent is the "206 system" in Shanghai. "206 system" full name "Shanghai criminal case intelligent auxiliary case handling system", is the 2017 KU Xunfei and Shanghai public prosecutors and law enforcement agencies jointly developed and online operation of the criminal case intelligent auxiliary case handling system. The system mainly uses artificial intelligence technologies such as optical character recognition, natural language processing, intelligent speech recognition, judicial entity recognition, entity relationship analysis, and automatic extraction of judicial elements, to guide the judge to collect and organize the evidence and test the evidence to ensure that the evidence in the case is real, legal and reliable, and the case handling process is visualized in all aspects so that the public can supervise the case [1]. The integration of artificial intelligence and judicial adjudication is the inevitable result of social development, and artificial intelligence can replace the judicial activities of judges to a certain extent in order to alleviate the pressure of judges' trials, and can also help the parties to better supervise the justice and obtain substantial justice [2].

2.2. Artificial intelligence affects judges' status as fact finders

At the rise of artificial intelligence technology, it was used for case evidence storage, first reflected in the application of blockchain technology to the storage of electronic data. As artificial intelligence technology continued to advance, evidence management systems emerged. Evidence management system was first used to identify, store and display evidence and information of the case, but later with the continuous optimization and upgrading of the system, it also has certain fact-finding functions. China University of Political Science and Law Institute of Evidence Science research and development of the evidence management system can be initially done on the basis of inputting the basic information of the case, analyze the nature of the case and automatically generate the verdict, and before generating the verdict undoubtedly have to determine the facts of the

case [3]. However, because the system's main function lies in evidence management, it is not currently explicitly applied to the field of case fact-finding. Under the guidance of many artificial intelligence judicial practice, artificial intelligence technology gradually penetrate into the judicial trial, for the fact that the determination of the judicial decision to provide advanced technical support, and gradually become the fact that the determination of the "main body", on the status of the judge as the fact that the determination of the status of the judge has had a certain impact. At present, artificial intelligence technology is still developing, the role of artificial intelligence in the determination of the facts of the case is also more and more obvious, the determination of the facts of the technology is also constantly optimized and upgraded, which also makes the artificial intelligence slowly evolved into the determination of the facts of the "main body", the judge's status as the main body of the determination of the facts has been affected to a certain extent. In the future, with the continuous maturation of technology, whether artificial intelligence can become the fact finder in the field of judicial adjudication is also a major problem that needs to be thought about and solved.

2.3. Lack of rules for the application of artificial intelligence in fact-finding
Although artificial intelligence has demonstrated significant technological advantages in data processing and identification, its application in the field of fact-finding also faces the problem of the absence of a system of application rules. The absence of such a system not only restricts the effectiveness and credibility of the application of artificial intelligence technology in the field of fact-finding, but also may lead to a series of complex legal, ethical and social problems. From a global perspective, only a few countries have begun to formulate specialized laws and regulations on artificial intelligence, and the vast majority of regions are still in a state of legislative void, which also makes the application of artificial intelligence in the field of fact-finding lack of a clear legal system to guide. Although in judicial practice artificial intelligence has been applied to evidence analysis and case fact-finding, but the legal effect of its findings is still widely disputed, and has not yet formed a unified legal consensus. This institutional gap not only increases the legal risk of the application of artificial intelligence, but also hinders its in-depth application in the field of fact-finding to a certain extent. In addition, the current application of artificial intelligence technology is mainly dependent on the relevant technology developers, if the technology developers use their power for personal gain and use their own technical advantages to interfere with the factual determination of the case, affecting the court's decision, will inevitably lead to more acute social conflicts. Therefore, it is also necessary to regulate the application of artificial intelligence in the field of fact-finding.

3. Analysis of the causes of problems in the application of artificial intelligence in the field of fact-finding
3.1. The times demand artificial intelligence for fact-finding
The current situation of "too many cases, too few people" in Chinese litigation field continues to intensify, which is a long-standing judicial challenge that is particularly prominent at present. During the two sessions in 2024, the words "the contradiction between people and cases is becoming more and more prominent" and "the contradiction between too many cases and too few people is becoming more and more prominent" appeared in the work report of the Supreme People's Court and the main data of the

people's court's trial and execution work respectively. 2023 main data of the people's courts' trial and execution work showed that: in 2023, the per capita handling of cases by the judges of the courts nationwide was 356.51 cases, a year-on-year increase of 13.42%, and the average number of cases closed per capita in the courts of Jiangsu, Chongqing and other courts exceeded 500 cases, and the overall pressure on the handling of cases is greater. The 2025 Supreme People's Court work report revealed that Chinese courts accepted 46 million cases in 2024, with judges handling over 350 cases each on average—3.4 times and 5.4 times the 2014 figures respectively. Accordingly, it can be seen that the current judges in China to adjudicate the heavy task, per capita per judge a day to handle a case, the case has become the biggest problem plaguing the national courts. "Litigation explosion" is increasingly prominent and develop into the norm. Therefore, how to solve this problem has become a major topic of discussion and research in today's judicial academia. In the face of the current "too many cases, too few people" of the judicial dilemma, as well as the increasing number of network information crimes, artificial intelligence technology has been applied to the judicial trial has become the inevitable result of the times. In order to solve the complexity of various cases, people began to seek non-traditional manpower to determine the score to end the dispute, technology has become a suitable choice. Artificial intelligence, with its data processing capabilities, deep learning technology and evidence preservation methods, has been gradually applied to the current judicial field, to determine the facts of the relevant cases, so as to make the corresponding judicial decisions.

3.2. Society at large trusts the results of artificial intelligence determinations

Compared with the traditional judge's determination of the facts of the case, the use of artificial intelligence to determine the facts of the case has certain advantages, which are mainly reflected in the efficiency and convenience, fairness and objectivity, and accuracy. These advantages make the public more inclined to choose artificial intelligence to determine the facts of the case, that the results of artificial intelligence is more objective and fair.

First, artificial intelligence is more efficient and quicker than traditional judges to determine the facts of the case. Because artificial intelligence technology is still a computer technology in essence, the computer's calculation speed is much faster than the human brain calculation. This efficient determination mode makes the efficiency of the case continue to improve, and the output of the adjudication results is also faster than ever. Driven by the result-oriented doctrine, the public tends to prefer to be able to quickly get the desired judgment results, so more inclined to use artificial intelligence to determine the facts of the case.

Second, artificial intelligence is more objective and fair than traditional judges in determining the facts of the case. On the one hand, because artificial intelligence is essentially an algorithmic system, it does not have human feelings, and it is more difficult to understand human feelings, which also to a certain extent to avoid the possibility of favoritism, interference with judicial justice. On the other hand, artificial intelligence can integrate the adjudication results of similar cases nationwide through big data collection and analysis, and provide judicial precedents for the ongoing cases based on the analyzed results, which can avoid the occurrence of different judgments in the same case and similar cases to a certain extent and affect the justice.

Third, artificial intelligence is more accurate than traditional judges in determining the facts of a case. Through deep learning technology, artificial intelligence can learn to master laws and regulations as well as the trial experience of various types of cases, and through the collection of huge amounts of data and information, it can integrate the decisions of courts around the world on similar cases, which can make the judgment more reasonable and be accepted by the society. In addition, the logic of artificial intelligence belongs to mathematical logic, which is more advantageous than general human thinking logic in fact-finding reasoning, and can make the fact-finding reasoning more organized and logical, and the results of reasoning are more reliable.

3.3. Conflict between legal lag and technological development

The inherent lag of the law is an undeniable fact, and this lag and the rapid development of technology will inevitably become a sharp contradiction. In the context of the rapid development of artificial intelligence, big data, blockchain and other information network technology, this contradiction is particularly prominent. As the cornerstone of social order, the construction of legal rules must go through strict legislative procedures, sufficient interest games and the cohesion of social consensus, and this mode of system construction determines its inevitable characteristics of stability and lag. In contrast, technological innovation is unstoppable, presenting a rapidly changing trend of evolution. This system construction and technological innovation between the rhythm of imbalance, resulting in the existing legal framework is difficult to effectively deal with the development of technology brought about by a new type of social relations and legal issues. Specifically to the current judicial field, although artificial intelligence technology has been initially applied in the analysis of evidence, factual determination and other aspects, but with the supporting legal rules system is seriously absent, showing a legislative gap. The legal problems brought about by artificial intelligence are caused by the lack of coordination between the law and the development of science and technology, but the essential reason lies in the unclear positioning of artificial intelligence in the law. In the face of a variety of legal dilemmas brought about by artificial intelligence, although many scholars have put forward countermeasures, due to the lack of effective legal and regulatory support, it is difficult for the judicial system to make judgments that are convincing to the public [4]. This lack of rules not only restricts the in-depth application of artificial intelligence in the judicial field, but also may bring new judicial risks. Therefore, it is also necessary to regulate the application of artificial intelligence in the field of fact finding and establish a perfect system of application rules.

4. Measures to standardize the application of artificial intelligence technology in the field of fact-finding
4.1. Clarifying the assistive positioning of artificial intelligence

Artificial intelligence can become a subject of law, the academic community has been in controversy, each party has its own opinion. It can be said that whether artificial intelligence can be recognized as a subject of law in our country relates to whether it can become a qualified subject of fact finding. As to whether artificial intelligence can obtain the qualification of legal subject, the affirmative mainly thinks that giving artificial intelligence the status of legal subject is not only conducive to the development of artificial intelligence, but also the requirements of social development [5]. The scholars who hold

supportive views on the legal subject qualification of artificial intelligence mainly hold the following views. Limited personality says that artificial intelligence does not have the ability to assume responsibility, is a legal personality with limited rights. Mimetic personality theory, on the other hand, believes that artificial intelligence can be made to have a legal personality secondary to human beings through legal mimicry [6]. The theory of restriction of legal fiction believes that through the legal fiction of the artificial intelligence will be established as a legal subject, it can be based on the algorithm to make the expression of meaning, to carry out certain legal behavior [7]. The scholars who hold a negative opinion on the qualification of the legal subject of artificial intelligence, mainly think that artificial intelligence is only a tool for human beings to realize their own purposes, and does not have the rational thinking of human beings, and identifies it as a legal subject in violation of the provisions of philosophy, sociology, ethics and so on. Artificial intelligence in essence belongs to the category of things, it does not have complete personality, so it should not be independent legal personality [8].

Because of the fierce controversy over the status of the legal subject of artificial intelligence, whether it can become a legitimate subject of litigation law and become the fact finder of the case is also subject to great controversy. Although in the current litigation activities, artificial intelligence gradually involved in evidence collection, court investigation, fact-finding and other aspects, "personification" more and more obvious, but also implies the theory of whether artificial intelligence can become the subject of litigation law. At present, China does not have any legal provisions of the artificial intelligence is clearly identified as the subject of law, so it is not ipso facto identified as the fact finder. Although the current artificial intelligence technology can assist in filing, scheduling, trial, determine the facts of the case, to generate documents, but it cannot independently carry out these operations, but also need to rely on human manipulation. Although artificial intelligence can rely on their own algorithms to criminal case facts, output factual findings, but these results need to be confirmed by the judge, can be used as the case of the application of law to determine the factual basis for adjudication. Therefore, the current artificial intelligence in fact-finding still has certain limitations, cannot independently as the main body of fact-finding, artificial intelligence should be positioned as an auxiliary tool to assist the judge in fact-finding.

4.2. Defining principles for specific applications of artificial intelligence

At present, artificial intelligence technology still needs to be manipulated by human beings in order to determine the facts of the case by virtue of algorithmic technology, and the factual findings generated by it need to be confirmed by the judge. Therefore, the current application of artificial intelligence in the field of fact-finding still has limitations, it is necessary to carry out certain regulation. In order to effectively use artificial intelligence technology to determine the facts of the case, to prevent the technical personnel of the judicial trial to intervene, in the establishment of artificial intelligence to determine the facts of the auxiliary positioning at the same time, should be established to support the application of the principle of constraints and regulations on the determination of the facts of the case of artificial intelligence.

First, the principle of algorithm disclosure. The principle of algorithm disclosure requires the court to disclose the part of the participation of artificial intelligence in the judicial trial and the content of the algorithm, so that the participation of artificial

intelligence behavior and algorithm is subject to social supervision, to ensure the fairness of the trial process [9]. At present, although artificial intelligence has gradually penetrated into the various stages of the case litigation, but the public and the judicial staff of artificial intelligence is still very shallow, may not be able to fully understand the algorithmic mechanism and operation logic behind it, in order to avoid the negative impact of the algorithmic black box may bring, should be regularly to the judicial staff and the public to open up and explain the algorithm of the operation of the artificial intelligence algorithm. The disclosure of artificial intelligence algorithms can enhance the transparency and fairness of the law, protect the legitimate rights and interests of the parties and the public's right to know, ensure judicial justice, improve judicial credibility, and promote the construction of a society based on the rule of law. At the same time, it can also enhance the sense of responsibility of the developers of artificial intelligence technology and prevent the occurrence of illegal and disorderly phenomena.

Second, the principle of open questioning. For computer algorithms, the parties and the public may be little knowledge, for things that do not understand people usually have a skeptical attitude, so the fact that the results of the artificial intelligence generated may not be recognized situation. In order to eliminate the suspicion of artificial intelligence technology, can set up a special organ of artificial intelligence algorithms to review the rationality and legality of the supervision, at the same time, both parties can also be used in the case of artificial intelligence assisted fact-finding system to apply for identification, in order to ensure that the trial activities are carried out smoothly. For algorithmic data that is suitable for in-court discussion, it is also possible to apply for expert assistants to testify in court [10]. Through the development of the artificial intelligence algorithm challenge system, on the one hand, to ensure the legitimate rights and interests of all parties, on the other hand, can also make it difficult for the algorithm to jeopardize the fairness of justice, to protect the justice of the litigation process as well as the fairness and impartiality of the trial results.

Third, the principle of normative application. At the current stage of artificial intelligence there are many technical problems and drawbacks, in its positioning as a factual determination of the auxiliary tool on the basis of the judicial personnel should be guided to standardize the application, in order to avoid as far as possible, the occurrence of the misuse of the situation, affecting the case of the trial. According to the current judicial practice, the scope of the use of artificial intelligence for fact-finding should be limited to a reasonable interval. Artificial intelligence technology can be applied to identify a single legal relationship, confirm the identity of the parties and other simple areas, for complex areas, especially involving the focus of the case, should be careful to apply artificial intelligence technology, in these areas should still rely on the judge's trial experience and professionalism. This standardized use of artificial intelligence technology also avoids, to a certain extent, the occurrence of erroneous fact-finding results and the phenomenon of judges attributing responsibility to artificial intelligence.

4.3. Utilizing judicial data for artificial intelligence applications

First of all, judicial data should be actively publicized so that artificial intelligence can learn. The lowest level of technical logic of artificial intelligence is the deep learning technology, artificial intelligence through independent learning of a wide range of judicial data, can be based on learning a large number of judges' experience in fact-finding to

establish a certain fact-finding model. However, if there is not enough judicial data for support, then artificial intelligence is also difficult to establish accurate fact-finding model. Therefore, people's courts at all levels should actively disclose judicial data, data-process the adjudication documents of criminal cases, and go online for public disclosure. In addition, the scope of judicial disclosure should also be expanded, except for the confidential ones, the litigation materials submitted or generated by the parties or their agents during the adjudication process, such as the indictment, the defense, and the transcripts of the court hearings, etc., should all be included in the scope of disclosure [11]. Through the above various ways of disclosure of litigation materials such as indictment, trial transcripts, judgments, collegial deliberations records and other litigation materials in the process of criminal proceedings, the artificial intelligence can learn from the experience of the traditional criminal judge's factual determinations, so as to establish a more accurate factual determination model, and to improve the quality of the artificial intelligence's factual determinations.

Secondly, vigorously improve the quality of judicial data, so that the artificial intelligence to establish a more accurate fact-finding model. The accuracy of the artificial intelligence fact-finding model is closely related to the quality of the judicial data it learns, so the content is detailed, the quality is reliable, the timeliness of the judicial data can become the quality of the artificial intelligence learning information, the resulting fact finding model can have a higher degree of accuracy [12]. And the current referee documents of uneven quality, the public legal documents of rough content abound, so we must require the relevant departments of the case data screening, extract the fact that the determination of accurate, factual determination of the detailed reasoning of the instrument for artificial intelligence to learn, in grasping the judicial data "quantity" at the same time, but also to fully take into account the "quality" of judicial data. In addition, the people's courts at all levels should strictly require each judge to make a detailed discussion of the factual reasoning, and at the same time in the production of legal documents should be used in French, so that the artificial intelligence to accurately identify, understand and learn.

Finally, timely update of judicial data, so that the artificial intelligence to update the fact-finding mechanism. Currently, all kinds of cases with the development of network information technology also presents a complex and changing pattern, the law is also changing, in the face of such changes, the artificial intelligence should also be timely to learn the new situation. Artificial intelligence only through the learning of new judicial data, in order to achieve their own continuous optimization and upgrading of the virtuous cycle. For newly enacted laws, judges should independently adjudicate to form new judicial data for artificial intelligence to learn. The fact-finding model of artificial intelligence should be regularly updated and upgraded according to the judge's judicial adjudication data, and the judge should strictly adjudicate judicially, and the technicians should update the judicial data in a timely manner to optimize the fact-finding model of artificial intelligence, so as to achieve a better and deeper integration and development of the artificial intelligence technology and the fact-finding of the case.

5. Conclusion

The development and application of artificial intelligence technology is the trend of today's society, the construction of the wisdom of the court so that artificial intelligence is also gradually applied in the case of fact-finding. In the face of the current application of

artificial intelligence in fact-finding that there are many problems in the status quo, there is a need for the application of artificial intelligence in the field of factual determination of legal regulation. Admittedly, the formulation of legal rules is not a quick fix, it needs the joint efforts of all social forces and follow the corresponding legislative procedures. Through the legal rules to regulate the application of artificial intelligence in the field of fact-finding, on the one hand, can reduce the artificial intelligence is misused, interfere with the occurrence of the judicial situation, so that the artificial intelligence technology on the determination of the facts to play a benign effect to promote, play its auxiliary case of fact-finding function. On the other hand, with the help of artificial intelligence can further enhance the level of justice, and promote the settlement of some difficult cases, and promote the construction of the rule of law in socialism construction.

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