Research on the application of artificial intelligence technology in the field of Justice

Chen Mingtsung 1*, Li Shuling 2
1Department of Public Administration, Nanfang College of Sun Yat-sen University, Guangzhou, Guangdong, 510000, China
2Department of Public Administration, Nanfang College of Sun Yat-sen University, Guangzhou, Guangdong, 510000, China
*Corresponding author’s e-mail: 306470714@qq.com

Abstract: With the progress of science and technology, the influence of artificial intelligence has gone deep into the judicial field. At present, the use of artificial intelligence in the court mainly includes information data-based, multi-body litigation service system, online dispute resolution platform, prediction and supervision of the results of entity judgment and other forms. At present, the application of artificial intelligence in the judicial field mainly includes the lack of authenticity and integrity of data, the limitation of its characteristics by artificial intelligence, and the weak acceptance of judges. China's courts at all levels are promoting the construction of "intelligent courts", which is an important part of the national network power strategy, as well as the embodiment of E-government in the judicial field. Through artificial intelligence technology, judicial procedures such as service, signature, evidence, trial, debate, record and judgment in the process of litigation are managed and controlled in a unified way. However, there are many problems to be overcome in the application of artificial intelligence technology in the judicial field. Therefore, it is the foundation of long-term and steady development to find out the problems in time and propose solutions.

1. Preface
In the recent years, the number of litigation cases in China has growing rapidly. However, the number of case handlers, especially judges, has not increased in the same proportion, and the tension of more cases and fewer cases has been continuing. At this time, artificial intelligence technology have made rapid development, how to improve efficiency in the case of fewer people and more cases, the focus is also on judicial intelligence. At present, artificial intelligence technology has been widely used in the judicial field of our country. The development of judicial intelligence in the judicial field is far ahead of the theoretical research field. Therefore, it is important and necessary to clarify the relevant concepts from the judicial practice, clarify the connotation and development background of judicial intelligence, and then analyse the problems in the process of judicial intelligence.

On July 8, 2017, the State Council issued the new generation of the artificial intelligence development plan, which pointed out that the establishment of an intelligent court data platform integrates trial, personnel, data applications, judicial opening and dynamic monitoring, and promotes the application of artificial intelligence in evidence collection, case analysis, reading and analysis of legal documents, to realise the intelligent and experimental ability of the trial system. According to the five-year development plan for the informatisation construction of the people's Court (2016-2020) issued by the Supreme
People's Court, the informatisation construction of the people's court is an important issue in the judicial reform and the transformation and upgrading of the court system. Therefore, it is necessary to strengthen the application of information platform and promote the integrated system of science and technology, such as electronic record items, trial speech recognition, intelligent trial service and office processing platform, to improve the level of information construction and promote fairness and justice.

Taking the number of judgment documents of "China judgment document network" as the analysis sample, in recent ten years, China's litigation cases have shown a growth trend, and now it has become the largest network of judgment documents in the world. By 2019, the number of online refereeing documents has reached more than 61 million, and the number of historical visits has reached 20 billion, involving more than 210 countries and regions, with the scale and number rising continuously. The figure below shows the number of all judicial documents in the ten years from 2010 to 2019. The data comes from the official website of "China judicial document website". The types of judicial documents include civil cases, criminal cases, administrative cases, state compensation cases and enforcement cases.

Table 1.2010-2019 Chinese judicial documents (unit: piece)

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|------|------|------|------|------|------|------|------|------|------|------|
| Cases | 86251 | 119596 | 273552 | 980991 | 4902514 | 6942905 | 12051910 | 16455728 | 18668831 | 19027856 |

(Source: China judicial document network)

It can be seen from the chart that the number of cases has an overall upward trend from 2010 to 2019, among which the number of judgment documents increased nearly five times from 2013 to 2014, and the number of online judgment documents in 2016 exceeded 10 million, nearly double the number in 2015. By the end of 2019, the total number of online referee documents reached 19027856, nearly 20 million. It can be seen that the number of judicial cases in China is increasing year by year, with a large number of cases and a huge increase. However, the number of judges has not increased in the same proportion, which has resulted in a tense situation of more cases and fewer cases. At the same time, with the implementation of the system of investigating misjudged cases in the reform of the judicial system, the number of cases handled by the judges at the grass-roots level is seriously overloaded, and the pressure of closing cases is unprecedented heavy.

In the case of fewer people and more cases, how to improve judicial efficiency naturally depends on the technology provided by artificial intelligence. However, we should be careful in the application of the "case push" technology of judicial intelligence, which can not produce excessive dependence and ignore the cumulative harm that "anchoring effect" may produce, thus affecting judicial justice.
2. Development
At present, the development of artificial intelligence in the court mainly includes information digitisation, integrated litigation service system, online dispute resolution platform, entity judgment result prediction, etc.

2.1 Information digitalization
Information digitisation refers to the transformation of non-electronic information such as voice and paper files into electronic data that is easy to save and copy. In 2017, the construction of intelligent courts covered 31 provinces and 1500 courts. The intelligent voice trial has achieved practical application results. The average length of court trial is shortened by 30%, the efficiency of collegial discussion is increased by 25%, and the quality and efficiency of handling cases by judges are improved.

2.2 Integrated litigation service system
The integrated litigation service system includes litigation service hall, online litigation service platform, self-service terminal, mobile phone application, 12368 Litigation Service Hotline and other contents, realising filing, inquiry and consultation on various platforms such as telephone, SMS, network, WeChat, MicroBlog and APP. There are also intelligent robots that provide human-computer voice interaction functions to realise intelligent litigation services, including visitor registration system, self-service filing information filling system, self-service litigation service terminal machine, self-service equipment, self-service navigation map and self-service electronic litigation guide screen, to improve the litigants' litigation service experience.

2.3 Online Dispute Resolution platform
The online dispute resolution platform can gather the court's trial mediation resources and the whole society's dispute resolution resources, open up various channels on the line and offline, and flexibly carry out mediation. At the same time, it can also achieve online mediation agreement and online judicial confirmation, and improve the efficiency of mediation. For example, Zhejiang Online Dispute Resolution mechanism platform is the first network integration platform for dispute resolution in China, with five functions of legal consultation, evaluation, online mediation, online arbitration and online litigation. As long as landing on the Zhejiang Online Dispute Resolution mechanism platform, the parties can complete dispute mediation online without leaving home.

2.4 Prediction of judgment results
The application of artificial intelligence technology in judicial documents, the resolution and research of key points, and the storage of these data in classification, and the establishment of a database, in the case of comparative analysis, to achieve prediction and judgment. The intelligent push system of similar cases that the Supreme People's court runs online aims to assist in decision-making, standardize judgment rules, integrate the application of law with quick query and intelligent push of similar cases, and repeatedly demonstrate and comprehensively judge the judgment results, which is the function of artificial intelligence technology in the prediction of judgment results.

3. Scope
3.1 Judicial trial business
The trial work of judges is the core of the proceedings, including the trial and the judgment. The application of artificial intelligence technology in the trial work of judges is mainly reflected in intelligent speech recognition and the judgment result prediction in the trial process. On the one hand, supervise the judge's judgment, reduce the phenomenon of different judgments in the same case to the greatest extent, to promote judicial justice. On the other hand, it is of great value to the parties. Through a large number of laws and cases stored in the
intelligent system, we can choose the best litigation strategy for the parties, reduce the litigation cost of the parties, and improve the legal awareness and the willingness to protect rights of the parties.

3.2 Judicial Auxiliary Affairs
Artificial intelligence technology judicial assistance mainly embodies two aspects: on the one hand, to identify and verify the standardization of evidence, to check the evidence materials that are in the key position in the trial work from the beginning of evidence collection, in order to assist the case handlers to sort and summarise the numerous evidence materials, to identify invalid evidence, no evidence and the other situations. On the other hands, in the work of proofreading and correcting the formal errors of the judgment documents, the errors in the text and expression of the judgment documents affect the seriousness of the justice, and the intelligent correction of the documents reduces the artificial errors, which helps to improve the judicial efficiency.

3.3 Judicial Search Service
Judicial search is a necessary work skill for all judicial workers. How to search out the target legal rules or cases quickly and accurately in the vast legal database is always what the judicial workers are searching for. Now, the traditional retrieval mode is to input keywords, which will present many search results with keywords. In the future, the research and development of semantic retrieval based on natural language processing and deep learning technology has emerged, which is the upgrading of traditional retrieval methods. The intelligent judicial retrieval service can present users with the most relevant and valuable retrieval results, and reduce the identification cost of irrelevant information.

4. Questions

4.1 Limitations of artificial intelligence
The core of AI lies in the algorithm it uses, and the process of trial lies in reasoning. On the one hand, artificial intelligence technology itself is difficult to achieve the replication of the trial process. In the trial practice, the judge mainly relies on the trial experience to make a fair and reasonable judgment on the facts, evidence and law application. On the other hand, artificial intelligence can not replace the discretion of judges, which is a supplement of law in the face of the complex social environment, because the legal provisions to be applied to specific cases can only be achieved through judges. Artificial intelligence can only rely on data to make judgments, but social life is complex, new problems emerge in endlessly, it is difficult to make accurate judgments. Just as there are no two identical people in the world, the parties in each case have a unique personality, and the limitation of artificial intelligence can only realise the general and mechanised justice. To embody justice in each case, we can only rely on the discretion of the judge.

4.2 Lack of integrity of judicial data
The core of AI technology lies in the data that it relies on. If the data itself is incomplete, it will eventually produce incorrect results. At present, China's judicial data come from the online judicial documents of China's judicial documents which were officially launched in 2014, and the comprehensive online judicial documents are not complete. Moreover, the judgment document only records the result of the judgment, and the judge's reasoning process cannot be found in the judgment document. Therefore, the data source of artificial intelligence technology can not reflect the complete referee process; it can not achieve accurate referee prediction function.

4.3 Willingness of the judge to accept
The willingness of judges to accept also affects the application of AI technology in judicial proceedings. At present, the judges who use AI technology mainly focus on young judges. The older judges are not willing to accept AI technology, and they think that AI technology is not helpful for
judges to handle cases. Some judges believe that it is emotionally unacceptable to hand over litigation cases that need social experience to cold robots. They would rather spend much time on their own to make their judgments, rather than hand them over to AI technology to automatically generate judgments.

5. Future direction

5.1 Clarify the role of AI technology in judicial assistance
The role of AI technology in the judicial field should be positioned in the auxiliary tools of judicial workers, which is determined by the limitations of AI technology itself. Although artificial intelligence has the speed of operation and function realisation that human beings cannot match, and cannot copy the influence of emotional and social factors in the process of judgment generation, it cannot replace the judge's trial experience and subjective initiative. If we rely on artificial intelligence technology to solve cases, we can only achieve general, mechanical and cold justice. However, for a long time, human thinking and culture of rule of law will have serious retrogression. Therefore, artificial intelligence technology is applied to deal with technical and auxiliary work, such as court records, data transmission, etc., to help judges deal with mechanical and repetitive work and improve the efficiency of judicial work.

5.2 Strengthen the interaction between judges and artificial intelligence
At present, the utilisation rate of artificial intelligence technology in the judicial field is low, mainly due to the judge's wrong understanding of artificial intelligence, strengthening the interaction between the judge and artificial intelligence technology, and changing the original judge working mode. The court shall improve its understanding of artificial intelligence technology, promote the application of artificial intelligence technology, and gradually and comprehensively implement online filing, online marking, online office and online management by organising judges' training, establishing evaluation mechanism, printing and distributing user manuals, etc. Also, the intelligent robot will be able to serve as the assistant of the judge and provide more convenience, support and assistance to the judge in dealing with the duplicate judicial affairs.

5.3 Establish a complete legal database
The incomplete and untrue legal data will affect the accuracy of the application of artificial intelligence technology in the judicial field. Therefore, the construction of a complete legal database will be an important work to promote judicial innovation in the future. The spirit of the legal database is to integrate all kinds of legal data of courts, procuratorates and lawyers, and to make them fully open. Also, the legal database can provide a wealth of case resources, so that judicial workers can analyse and summarise various types of cases, which is conducive to improving the level of trial work, and the public can also predict the judgment results.

6. Comment
In recent years, many new words such as "intelligent court ", "robot judge" and "people's court informatisation 3.0" frequently appear in the judicial field. The main reasons for these new words are as follows: on the one hand, there are many problems in the judicial field, such as more cases, less litigation efficiency, judicial corruption and so on. It can be seen that the judicial interior also needs reform and improvement. On the other hand, the Internet, big data, cloud technology and other aspects have also made remarkable achievements. Due to the combination of technology and law, the application of artificial intelligence technology in the judicial field is inevitable.

Judicial development will be more and more prosperous with the progress of science and technology. It is unknown what effect and problem will be produced by the new judicial phenomenon. However, we are sure that the instrumental value of science and technology is obvious, and the application of science and technology in the judicial field should be encouraged. With the continuous development of science
and technology, human beings will continue to make progress, and the worry about the hidden dangers of technology has never been absent from the discussion of technical problems. However, every technological revolution in history has brought great changes to our lives. We cannot measure the total value brought by the replacement and replacement of this change process. In the research and development of science and technology, human intelligence will continue to progress. Resources restrict science and technology, and science and technology restrict science and technology will be an effective direction to control science and technology.

The application of artificial intelligence technology in the judicial field will be a real revolution. It will enhance the transparency of the judicial process, enhance the fairness of the judicial judgment, and improve the efficiency of the judicial work. It also puts forward many challenges and demands, among which interdisciplinary research and the cultivation of composite talents are the most fundamental and the longest cycle. In the face of many theoretical and practical challenges in the process of judicial intelligence, we should face and solve them. Let technology integrate into our system or ethical framework, or our system or ethical framework is improved because of the system. We should pay attention to the construction and maintenance of this internal unity. Therefore, the judge should also be alert to the application of judicial intelligence case pushing technology, which can not produce excessive dependence and may cause cumulative harm, thus affecting judicial justice. In the development of judicial intelligence, there are many challenges and demands in practice, and interdisciplinary research and the cultivation of composite talents are the most fundamental and the longest cycle. In addition, judicial practitioners and legal researchers find out problems accurately and timely, design solutions, and have sensitive prediction ability and problem awareness, which is the foundation of the long-term and stable development of judicial intelligence.

7. Conclusion
When law meets technology, how will judicial reform respond to the development of artificial intelligence. At the beginning of the development of new things, there will always be two camps of conservatives and radicalists, but judicial practice is the field of the combination of legal cognitive rationality and practical rationality, which is related to legal effectiveness and fairness and justice, which can be said to be the basic problem of society. With the development of science and technology, even if the accuracy and flexibility of artificial intelligence technology in predicting the judgment result of a case reach 99%, we should also avoid the injustice that the remaining 1% may bring. Because of the special cultural background of our country, whether the artificial intelligence that the dispute settlement completely resort to the cold ice can be convinced by the public, especially the legal culture of our country is deeply restricted by the Confucian culture, the legal consciousness of "harmony is precious", "emotion, theory, law" and so on, replacing human intelligence with human intelligence is not necessarily a good thing. Therefore, we should be alert to the absolute dependence of judicial workers on artificial intelligence technology. What we need to prevent or control is the mistakes of human cognition and cognitive bias, and integrate artificial intelligence technology with our existing institutional framework and ethical framework, which is the direction we should think about and study.

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