Artificial Intelligence and Courts in China

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Abstract
This article introduces the development of artificial intelligence in courts in China, explores the specific applications of speech recognition, image recognition, and knowledge graph technology in these courts, and discusses the changes that these applications have brought to the courts in areas such as litigation guidance, case registration, trials, and document processing. The article concludes by pointing out the potential future impacts of artificial intelligence on data security, amendments to litigation laws in China, job prospects of legal professionals, and other issues that merit further consideration and discussion.

Background
The development of artificial intelligence in Chinese courts began in 2016. At the Forum on the Rule of Law in Cyberspace of the 3rd World Internet Conference held on November 17, 2016, President ZHOU Qiang of the Supreme People’s Court (the “SPC”) noted, “the application of artificial intelligence in the judicial field will be actively promoted”. At a time when no relevant laws or judicial documents have been issued by China to cover the topic, President Zhou’s statement laid a foundation for the use of artificial intelligence in judicial departments.

Since then, artificial intelligence has been further promoted with the construction of “intelligent courts”. In April 2017, China formally incorporated artificial intelligence into the plans for the construction of “intelligent courts”. According to the Opinion of the Supreme People’s Court on Accelerating the Construction of Intelligent Courts (the “Opinion”), the term “intelligent court” refers to:

“[I]n […] The Fifth Five-Year Reform Outline of the People’s Courts (2019-2023), the SPC emphasizes again the important role of artificial intelligence in the institutional reform of the judicial system: [the courts] ‘shall fully utilize […] modern technologies like artificial intelligence to […] enhance judicial efficiency and competence.’”

A people’s court which fully utilizes advanced information systems to support online processing of all services, disclosure of the entire process in accordance with law, and intelligent services in all aspects, in order to realize the organization, construction, and operation of a fair judiciary that works for the people. (emphasis added)

Additionally, the Opinion outlines the potential role of artificial intelligence in the operation of courts in the future: “big data and artificial intelligence technology will be used to provide precise, intelligent services on demand.”

On February 27, 2019, in the Opinion of the Supreme People’s Court on Deepening the Comprehensive Reform of the Judicial System of the People’s Courts: The Fifth Five-Year Reform Outline of the People’s Courts (2019-2023), the SPC emphasizes again the important role of artificial intelligence in the institutional reform of the judicial system: [the courts] “shall fully utilize […] modern technologies like artificial intelligence to […] enhance judicial efficiency and competence” and “shall provide strong scientific and technological support to promote the modernization of the adjudication system and adjudication capacity.”

Artificial Intelligence Technologies Applied in Courts
The application of artificial intelligence in Chinese courts today mainly involves three types of technologies: speech recognition, image recognition, and knowledge graphs.

Speech recognition technology refers to the technology that uses computer software to convert speech signals into text or instructions. The technology enables computers to “understand” human languages and extract the text information contained in human speech, thereby facilitating human–computer communication and interaction. Applications of speech recognition technology in Chinese courts primarily include intelligent robots providing litigation guidance, artificial intelligence clerks, and speech recognition during trials and related retrievals of electronic evidence based on voice information.

Image recognition technology refers to the use of modern information processing technology and computing technology...
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to simulate human cognitive processes. Based on observed images, different categories of objects shown in the images are distinguished and meaningful determinations are made. Image recognition technology is mainly applied in Chinese courts to produce electronic case files. Synchronous conversion of paper litigation materials into reproducible and readable electronic files can facilitate automatic completion of information related to registration and conclusion of cases. The system can even automatically capture the key information in each file, generating “semi-finished” adjudication documents in one click. Judges then edit the contents, such as the reasons for the adjudication and the text of the final judgment, thereby creating a complete adjudication document.

The concept of knowledge graphs was officially proposed by Google in 2012. Knowledge graphs are essentially knowledge databases of semantic networks, which present and store natural language sentences in the form of graphs. The ability of knowledge graphs to describe data is very strong. For courts in China, the ultimate goal for the application of knowledge graph technology is the accurate recommendation of similar cases, a goal that is currently in the stage of exploration and experimentation.

There is a saying in the field of artificial intelligence: “how much intelligence I give you depends on the amount of knowledge you give me.” A machine’s intelligent comprehension of individual cases needs to be built on the machine’s deep learning of judicial big data. Thus, the primary task of constructing a legal knowledge graph is to accumulate knowledge and build a relevant knowledge base. How then should knowledge be accumulated, given the incredibly massive amount of judicial data? Some scholars believe that knowledge accumulation requires the refinement of common rules: that is, developers must examine various legal scenarios, extract rules, and annotate data to allow machines to learn and develop human-like capabilities in information extraction and logical analysis. At present, prior experiences of various courts suggest that the basic path of knowledge accumulation involves experts’ deconstruction of case elements and adjudication rules, their annotation of relevant knowledge points, and then, their passing of all of the information and knowledge to machines for the machines’ deep learning. According to a study of adjudication assistance systems in various provinces and municipalities, including Guangdong, Zhejiang, Shanghai, and Chongqing, the effective approaches to date are Shanghai’s adjudication assistance system and a method called “Knowledge Accumulation by Deconstructing Adjudication Elements”, which has been adopted by the Intelligent Adjudication Platform of the High People’s Court of Chongqing Municipality.

Specific Applications of Artificial Intelligence in Courts

In practice, the technologies of speech recognition, image recognition, and knowledge graphs are mainly applied
to courts’ litigation guidance services, case registration procedures, trials, and document processing.

**Litigation Guidance Service**

In recent years, alongside rapid developments in Chinese society, the Chinese people’s legal awareness has continuously grown and their demand for legal advice has also increased. However, current legal services cannot meet this demand. In order to make up for the shortage of legal services personnel, some provinces have developed intelligent robots with different names to help address the public’s legal queries (see Table 1).

<table>
<thead>
<tr>
<th>Province or Provincial-Level Municipality</th>
<th>Intelligent Robot</th>
<th>Service Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing Municipality (Bureau of Justice, Fengtai District)</td>
<td>“Feng Xiaoxuan”</td>
<td>Legal Knowledge Dissemination</td>
</tr>
<tr>
<td>Fujian Province</td>
<td>“Xiaofa”</td>
<td>Legal Knowledge Dissemination and Litigation Guidance</td>
</tr>
<tr>
<td>Sichuan Province (People’s Court of Chongzhou Municipality)</td>
<td>“Xiaochong”</td>
<td>Intelligent Consulting, Intelligent Assessment, and Online Dispute Resolution</td>
</tr>
<tr>
<td>Anhui Province (Yushan District People’s Court of Mă’anshan Municipality)</td>
<td>“Xiaoyu”</td>
<td>Information Dissemination on Court Operations such as Case Registration, Enforcement, and Payment of Fees</td>
</tr>
<tr>
<td>Chongqing Municipality</td>
<td>“NewGo AI”</td>
<td>Legal Consulting</td>
</tr>
</tbody>
</table>

*Table 1: Intelligent Robots and Their Service Functions in Some Provinces and Municipalities*

In addition to providing litigation guidance services, these intelligent robots are generally entertaining and interactive, and this enables them to disseminate legal knowledge to the public.

**Case Registration Procedures**

Courts in China constantly receive complaints, including countless letters and visits, about their cumbersome traditional case registration procedures. To address this issue, China has used artificial intelligence to take a series of remedial measures.

In order to simplify case registration procedures and reduce the number of times parties need to travel to and from court, the Dongsheng District People’s Court of Ordos Municipality, Inner Mongolia Autonomous Region, has promoted a litigation services model of “Artificial Intelligence + Diversified Dispute Resolution”. Through artificial intelligence functions such as the “Materials Transfer Box” and “Intelligent Messaging”, judges can immediately see which materials need to be verified and received and parties can quickly provide relevant materials and be informed as to whether requirements for case registration have been met. These functions have demonstrably improved overall registration efficiency. According to official statistics, in 2016, within less than a year, the litigation service center of the Dongsheng District People’s Court provided case information in response to more than 6,500 inquiries made by parties, scheduled more than 4,000 appointments with judges, and transferred more than 3,000 sets of materials.

**Trials**

At present, the technology that is more maturely applied in court trials is speech recognition. The distinctive feature of using such technology is that it enables recording of a court proceeding through intelligent transcription from speech to text, in tandem with the trial process, and these resulting texts are more objective, accurate, and complete. In practice, during a trial in which a party is emotional or shows a lot of resistance, it is difficult for the clerk to fully record the entire content of the proceeding and this may lead to loss of information. In addition, clerks’ summaries of court proceedings may, due to the clerks’ subjective filtering and re-expression, change the original meanings and distort the facts ascertained by the courts. A more commonly encountered situation is one where, in order to facilitate the clerks’ recordings of court proceedings, judges slow down the pace of trials and remind the parties to repeat and slow down the presentation of their arguments. This may undermine the coherence of a trial and the ability for one party to promptly challenge the other’s arguments. Speech recognition and text conversion technology can effectively solve these problems.

Courts in provinces and municipalities, including Zhejiang, Anhui, Jiangsu, and Beijing, have widely applied speech recognition systems in trials to automatically distinguish speakers and their statements and to convert speech into text so as to improve the efficiency of trials. As of April 2018, the Intermediate People’s Court of Suzhou Municipality, Jiangsu Province, has managed to use a speech recognition system with a speech recognition accuracy rate of more than 90%, shortening the duration of trials by an average of 20% to 30%.

“[...], on January 23, 2019, China further integrated speech recognition, image recognition, and knowledge graphs [...] and applied them in a trial for the first time.”

Following the courts’ successful application of speech recognition technology, on January 23, 2019, China further integrated the three artificial intelligence technologies
mentioned above (i.e., speech recognition, image recognition, and knowledge graphs) and applied them in a trial for the first time.\textsuperscript{32} This trial was held in the Shanghai No. 2 Intermediate People’s Court, and it involved a robbery case. The special technology used in the hearing was the “the Intelligence-Assisted System for Handling Criminal Cases in Shanghai”, also known as the “206 System” because the Central Political and Legal Committee assigned the task of developing this system to the High People’s Court of Shanghai Municipality on February 6, 2017.\textsuperscript{23}

During the trial on January 23, 2019, the “206 System”, using speech recognition, automatically extracted from the full set of evidentiary materials any information associated with the speech content and presented the information to the judges, prosecutors, and defense attorneys for their reference.\textsuperscript{24} This process also involved the application of image recognition technology, which made it possible for electronic files of the case to be retrieved and read by the system, and relevant information in the files could then be presented after the system recognized the voice commands. The legal knowledge graph technology used in the “206 System” played a significant role in the investigation of the case. For example, using the “Evidence Guidance” function developed from the legal knowledge graph technology, the court identified the flaw that there were no seizure records accompanying the seized items involved in the case. In addition, the court used this “Evidence Guidance” function to review whether different evidence proving the same fact corroborated each other, whether different evidence proving different facts were logically consistent, and whether different statements of the defendant were contradictory.\textsuperscript{25}

The efforts undertaken to develop this “Evidence Guidance” function are noteworthy. During the development process, members of the “206 System” project included a large number of evidentiary standards, studied tens of thousands of case materials, and engaged experts in elaborately annotating those materials.\textsuperscript{26} According to official statistics, pilot courts in Shanghai have used the “Evidence Guidance” function 15,653 times, and have found 405 flaws in evidence.\textsuperscript{27}

\textit{Documents Processing}

Courts in China have also actively applied artificial intelligence technologies to prepare adjudication documents. For instance, the “Smart Adjudication Model” of the Intermediate People’s Court of Suzhou Municipality, Jiangsu Province, and the “Intelligent Document System” of the Wuhou District People’s Court of Chengdu Municipality, Sichuan Province, have both used image recognition and legal knowledge graph technology to help prepare adjudication documents and handle simple cases. Both systems were launched after deep learning had been conducted to understand the trial rules and adjudication standards applied in specific types of cases (e.g., cases that are large in quantity but with relatively simple facts) handled by courts in the entirety of both municipalities. When dealing with a new case, the systems can automatically extract information from electronic files and automatically generate “semi-finished” or “finished” adjudication documents. After judges supplement, review, or confirm these drafts, both systems can rapidly produce final adjudication documents, thereby improving the efficiency of preparing these documents. The Wuhou District People’s Court of Chengdu Municipality, Sichuan Province, states that while judges using the traditional approach need approximately two hours to draft an adjudication document for a simple case, they only need about 15 minutes to produce a complete adjudication document using the “Intelligent Document System” by modifying and supplementing the drafts that the system automatically generates.\textsuperscript{28}

Artificial intelligence technologies have also been widely applied to the preparation of official documents other than adjudication documents. The “Smart Trial System” developed by the High People’s Court of Hebei Province, as tasked by the SPC, can assist judges in generating various documents such as court notices, subpoenas, announcements, and service receipts with one click. Courts in provinces such as Hebei, Jilin, Guangdong, and Zhejiang have used the system widely, reducing judges’ workloads by over 30%.\textsuperscript{29} According to official statistics, an average of over 2,000 judges in Hebei Province use this system every day, generating about 40,000 legal documents, of which nearly 4,000 are adjudication documents.\textsuperscript{30}

\textbf{The Potential Impact of Applying Artificial Intelligence in Courts}

Artificial intelligence is profoundly changing the mode of operation for Chinese courts in areas such as litigation guidance, case registration, trials, and preparation of adjudication documents. It is likely to have an even more profound impact in the future.

Firstly, the development and application of artificial intelligence technologies require courts to improve their management of artificial intelligence so as to prevent the abuse of such technology. With the greater usage of artificial intelligence in deep mining and analysis of big data, the data security of courts will become even more closely intertwined with the protection of citizens’ personal information. To date, China has not yet promulgated a data security law, and provisions on personal information protection are scattered throughout many different laws and regulations such as the \textit{Cybersecurity Law} and the \textit{General Principles of the Civil Law}. In the era of artificial intelligence and big data, all countries are striving to improve data-related legislation. This trend also pressures Chinese legislators to introduce
a systematic data security law to improve the protection of citizens' personal information and data.

Secondly, artificial intelligence will greatly simplify the litigation process and change existing litigation procedures. China has issued some supplementary provisions in the form of judicial interpretations to alleviate the impact of the use of speech recognition, image recognition, and other technologies on existing laws regulating litigation.\(^6\) It is, however, difficult to fundamentally resolve the drawbacks of procedural complexity and low efficiency of the litigation laws formulated in the pre-Internet era. Therefore, the application of artificial intelligence technology may encourage the revision of China’s litigation laws.

Finally, artificial intelligence has brought unprecedented challenges to established social ethics. For instance, the “NewGo AI” robot launched in Chongqing is the first intelligent legal consultation robot equipped with “brain-like” technology in China. In the first “Human-Machine Competition” held by the legal community in China in August 2018, the “NewGo AI” robot competed with six publicly-recruited, experienced lawyers in the areas of facts discovery and legal service provision. The robot defeated the six lawyers.\(^3\) This example reflects how the development of artificial intelligence has reached a notable level, raising the question of whether it is possible for artificial intelligence to replace legal professionals in the future. Some scholars have expressed doubt about the possibility of artificial intelligence replacing the central roles that judges play in such areas as evidence exclusion, determination of the weight carried by a piece of evidence, and exercise of discretionary power in trials.\(^3\) However, we must recognize that artificial intelligence is still in its nascent stage; we are still in an era with weak artificial intelligence. As robots continue to gain greater recognition and control capabilities, and as the influence of human consciousness and will on robots’ behavior gradually weakens, artificial intelligence may generate more unprecedented risks.\(^4\) How society should clarify the boundaries of artificial intelligence technology, and whether to formulate a systematic artificial intelligence law or to regulate artificial intelligence under different areas of laws, are all issues that deserve further consideration and discussion.\(^5\)

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\(^{7}\) 《最高人民法院关于加快建设智慧法院的意见》(Opinion of the Supreme People’s Court on Accelerating the Construction of Intelligent Courts), issed on and effective as of Apr. 12, 2017, http://gongbao.court.gov.cn/Detailed/50e5c527431c222b72163b49f0284.html.

\(^{Id.}\)


\(^{10}\) Id., e.g. ZHU Chuan et al., 《法庭语音识别技术的完善与配套机制研究》(A Study on the Benefits and Supporting Mechanisms of the Speech Recognition and Transcription System in Trials), 《人民法院报》(People’s Court & Applications), Issue No. 19 49 (2018).


\(^{12}\) Id., e.g. ZHANG Jiyi, 《图像识别的技术现状和发展趋势》(The Current Status and Development Trends in Image Recognition Technology), 《计算机知识与技术》(Computer Knowledge and Technology), Issue No. 21, 6045 (2010).


\(^{14}\) Id., e.g. QI Guilian et al., 《知识图谱研究进展》(Progress in the Research of Knowledge Graphs), 《情报工程》(Technology Intelligence Engineering), Issue No. 1, 5 (2017).

\(^{15}\) Id., e.g. DING YONGhong, 《计算机——理论、技术与应用》(Computational Intelligence —— Theories, Technologies, and Applications) (Science Press, 2002), at 8.

\(^{16}\) Id., e.g. GAO Xiang, 《人工智能民事司法应用的法律知识图谱构建》(The Construction of Legal Knowledge Graphs in AI Civil Judicial Applications —— Based on Essential Facts of Civil Rulings and Judgments), 《法制与社会发展》(Law and Social Development), Issue No. 6, 68 (2018).

\(^{17}\) Id., e.g. GAO Xiang, Deputy Director of the Research Office in the High People’s Court of Chongqing Municipality, investigated, through questionnaires and interviews, the adjudication assistance systems in various provinces and municipalities, including Guangdong, Zhejiang, Shanghai, and Chongqing, and explored methods of knowledge accumulation. Id. at 68–69.

\(^{18}\) Id., e.g. ZHANG Shoufeng, 《政治和法律器官欢迎人工智能 “好帮手”》(Political and Legal Organs Welcome Artificial Intelligence as a “Good Helper”), 《法制日报》(Legal Daily), Dec. 6, 2017, http://js.lawdaily.com.cn/content/2017-12/06/content_7417355.html?node=37232; JIN ZHAOling & YUE (ZHANG Zhaorong & IL Yue), 《智能导诉机器人受相马斯等》(Intelligent Litigation-Guidance Robot Datasets in Malanshan), 《人民法院报》(People’s Court Daily), May 25, 2016, https://www.chinacourt.org/article/detail/2016/05/id/1800680.shtml.


18 See id.

19 See 余东明 (YU Dongming), 沪研发“206系统”争当世界领跑者 (Shanghai Develops “206 System”, Striving to be a World Leader), 《法制日报》 (LEGAL DAILY), Jan. 24, 2019, http://epaper.legaldaily.com.cn/frzb/content/20190124/Article01009GN.htm.


22 See YU Dongming, supra note 19.

23 See id.

24 See id.

25 See id.


28 See 徐清宇 (XU Qingyu), 智慧审判苏州模式的实践探索 (The Practical Exploration of the Smart Suzhou Adjudication Model), 《人民法院报》 (People’s Court Daily), Sept. 13, 2017, https://www.chinacourt.org/article/detail/2017/09/id/2995627.shtml; see also WANG Xin et al., supra note 9.

29 See QIAO Wenxin, supra note 21.

30 See XIANG Jianfeng, supra note 27.

31 See《最高人民法院关于互联网法院审理案件若干问题的规定》 (Provisions of the Supreme People’s Court on Several Issues Concerning the Adjudication of Cases by Internet Courts), passed by the Adjudication Committee of the Supreme People’s Court on Sept. 3, 2018, issued on Sept. 6, 2018, effective as of Sept. 7, 2018, http://www.court.gov.cn/zixun-xiangqing-116981.html.


33 See 潘勇 (PAN Yong), 人工智能介入司法领域路径分析 (Analysis of the Route for Incorporating Artificial Intelligence into the Judicial Field), 《东方法律》 (ORIENTAL LAW), Issue No. 3, at 113 (2018).

34 See 刘长安 (LIU Xianquan), 人工智能犯罪刑法规范的路径 (The Route for Regulating Crimes Involving Artificial Intelligence), 《现代法学》 (MODERN LAW SCIENCE), Issue No. 1, at 75 (2019).

35 China’s legislation related to artificial intelligence is still in its preliminary stage. During the 13th National People’s Congress, 31 delegates, including SHI Guifu, submitted a “Proposal on the Formulation of the Artificial Intelligence Development Law (No. 68)” to a special committee for its review. The proposal is now included in the third category of the legislative plan.