

# Research on the Application of Artificial Intelligence in Criminal Evidence Examination and Judgment

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## Abstract

The application of artificial intelligence in the field of criminal evidence review and judgment has significant advantages, which are conducive to improving the efficiency of case processing, enhancing the reasoning ability of judicial personnel, and preventing judicial corruption. However, artificial intelligence is still facing a series of problems in its practical application in this field, including the inability of artificial intelligence to simulate the assessing process of probative value, the imperfect construction of the criminal evidence database of artificial intelligence, and the lack of clarity of the subject of responsibility for the misjudgment of criminal evidence by artificial intelligence. To this end, a series of measures should be taken to address these challenges, including clarifying the use of artificial intelligence for auxiliary examination of probative value, optimizing the criminal evidence database for artificial intelligence, and insisting on the status of judicial personnel as the main body of responsibility.

## Keywords

Artificial Intelligence; Criminal Evidence; Examining Judgments; Big Data.

## 1. Introduction

The development of artificial intelligence technology has had a far-reaching impact on social life, and at the same time has brought new opportunities and challenges to the examination and judgment of criminal evidence. The examination and judgment of criminal evidence is the core link in criminal proceedings, and plays a crucial role in the judgment of the case, which not only requires judicial personnel to review the competency of evidence and probative value of individual evidence, but also to make a comprehensive analysis and judgment of the evidence of the whole case. Therefore, in the process of applying artificial intelligence to review and judge criminal evidence, the auxiliary status of artificial intelligence should be made clear to ensure the fairness of the results of case processing.

## 2. The Necessity of the Application of Artificial Intelligence in the Examination and Judgment of Criminal Evidence

### 2.1. Contribute to the Efficient Handling of Cases

As the concept of the rule of law is deeply rooted in people's hearts, people's awareness of their rights is increasing, and the explosion of litigation has become a real problem in the judicial field. In judicial practice, the contradiction of too many cases and too few judicial personnel has become more and more prominent. Improving judicial efficiency and meeting the judicial needs of the people have become the focus of judicial reform. The application of artificial intelligence in the examination and judgment of criminal evidence provides new ideas and directions for solving the above problems. First, artificial intelligence can allow case handlers to get rid of the shackles of repetitive work and devote more time and energy to the core business. For example, artificial intelligence can use keyword search and positioning, one-click conversion of files,

intelligent review of evidence and other intelligent functions to realize the criminal evidence review judgment [1]. Compared with the traditional human operation, the intelligent system does not require the case officer to manually go through and find the evidence materials. Case officers only need to enter keywords in the intelligent system to search, and then they can realize the accurate positioning of evidence, significantly shorten the time spent in the repeated search for evidence, effectively avoid the problem of missing evidence review due to manual errors, and effectively improve the efficiency of the case. Secondly, artificial intelligence can use algorithms to rigorously review the evidence material, accurately identify the defects or errors in criminal evidence, and remind judicial personnel to make timely corrections. Artificial intelligence can not only verify the authenticity of a single piece of evidence, but also conduct a comprehensive analysis of the evidence of the whole case, revealing the contradictory points, reducing procedure circumfluence triggered by flaws in the review of evidence, and enhancing the efficiency of case processing.

## **2.2. Enhancement of the Reasoning Capacity of Judicial Officers**

When dealing with major and difficult criminal cases, judicial officers are often faced with the challenge of a large and varied body of evidence. Such evidence includes physical evidence, documentary evidence, victim statements, witness testimonies, confessions and defenses of criminal suspects, expert opinions, audio-visual materials and electronic data. Judicial officers need to collect, organize and analyze evidence based on legal procedures, and use evidence to reason and determine the facts of the case, a process that not only requires a great deal of time and energy, but also puts forward high requirements for the reasoning ability and professionalism of judicial officers. However, the introduction of artificial intelligence technology into the review and judgment of criminal evidence can effectively make up for the limitations of human thinking and improve the reasoning ability of judicial personnel. Specifically, AI can efficiently screen the evidence involved in a case through big data analysis, pattern recognition and machine learning technologies, accurately identify key information, and verify the authenticity of a single piece of evidence; AI can analyze the correlation between the evidence and reveal the potential chain of evidence; and AI can prompt judicial personnel to pay attention to the flaws that may exist in some of the evidence, so as to improve the evidence accuracy of reasoning. In addition, in the comprehensive evaluation of evidence, AI can also help judicial officers examine cases from a macro perspective, avoiding misjudgment due to personal experience or bias, and ensuring the fairness of case handling.

## **2.3. Contributing to the Prevention of Judicial Corruption**

"Full-process participation, full-process intelligence, full information disclosure, and full node trace" are typical features of artificial intelligence in the field of criminal evidence judgment, which has a positive effect on the prevention of judicial corruption. First of all, artificial intelligence can significantly reduce the interference of judicial personnel in the process of criminal evidence review and judgment by external emotional factors, such as money transactions, leadership authorization and public opinion pressure and other adverse effects. Artificial intelligence does not have human emotions, so it will not deviate from the established path of the algorithm due to the above factors, and it will not draw unreasonable conclusions on the review and judgment of criminal evidence [2]. Secondly, artificial intelligence can record the whole process of case handling, monitor the judicial activities of judicial personnel, and reduce the space for human operation. Artificial intelligence improves judicial transparency by means of data trace, prompts judicial personnel to strictly comply with judicial procedures, and restricts the arbitrary operation of judicial personnel in the examination and judgment of criminal evidence. Artificial intelligence will trigger an alarm once it discovers the illegal and irregular behavior of judicial personnel in the examination and judgment of criminal evidence, which to a certain extent plays a normative role for judicial personnel, guarantees the fairness

of the case processing, and prevents judicial corruption. Finally, artificial intelligence can assist judicial personnel to realize the same case and the same judgment, this unified judgment is established on the basis of a unified standard of evidence [3]. Artificial intelligence can be "correlated data", with the historical case of criminal evidence review to maintain consistency, but also can use the "derivative data", to ensure the consistency of future similar cases of criminal evidence review. Through the assistance of artificial intelligence, the standardization and normalization of judicial procedures can be achieved, eliminating subjective bias and reducing human error, ensuring that each case can be handled fairly.

### **3. The Dilemma of the Application of Artificial Intelligence in the Examination and Judgment of Criminal Evidence**

In the context of the new era of the deep integration of artificial intelligence and criminal justice, artificial intelligence has made remarkable achievements in the field of criminal evidence review and judgment, not only improving the efficiency of case handling, but also achieving remarkable results in promoting judicial fairness and justice. However, combined with China's current practice, the application of artificial intelligence in criminal evidence review and judgment still has a number of deficiencies, and it is in urgent need of further improvement and optimization. For this reason, it is necessary to analyze the current problems and challenges and actively explore corresponding improvement strategies, with a view to better exerting the advantages of artificial intelligence in the field of criminal justice.

#### **3.1. Artificial Intelligence Cannot Simulate the Process of Assessing Probative Value**

In the field of criminal justice, artificial intelligence can rely on a large amount of data and advanced algorithms to realize the review of competency of evidence. Specifically, the first is to review the objectivity of the evidence. Artificial intelligence can quickly identify forged signatures and seals through the graphic recognition function. And the second is to review the relevance of evidence. Artificial intelligence can discover the relevance of potential evidence through big data analysis technology and provide tips on the contradictions between evidence. The third is to review the legitimacy of evidence. This includes reviewing the legitimacy of the main body of evidence collection and collection procedures, reviewing whether the form of evidence complies with the legal types of evidence, and reviewing whether the production of transcripts of interrogations, questioning, etc., follows the provisions of the law.

However, the magnitude of probative value cannot be summarized by data and algorithms. Generally, the law does not presuppose the probative value of specific evidence. The law only prescribes that the probative value of the original evidence is greater than that of the hearsay evidence, the probative value of direct evidence is greater than that of the indirect evidence and so on. In judicial practice, the judgment of the probative value depends mainly on the judge, the judgment process requires judges to have deep legal literacy, correct values, rich work and life experience and the ability to treat specific cases and specific evidence. It can be seen that the judgment of probative value is a complex process, closely related to the life experience and trial experience of judicial personnel. The number of experiences is infinite, and it is constantly changing with the pluralism and stratification of society [4]; the experiences contained in different ethnic groups, regions, industries, and customs are also different, and AI is not yet able to directly transform human experiences into data or algorithms through implantation. Although artificial intelligence can continue to expand its "experience base" through deep learning and other advanced technologies, its growth rate is still difficult to compare with the accumulation of human experience. As a result, the process of judging the probative value is difficult to apply by means of fixed formulas or data analysis by artificial intelligence, and it is difficult to be imitated by artificial intelligence.

### 3.2. Inadequate Construction of Criminal Evidence Databases for Artificial Intelligence

First, the data collection is not comprehensive. The amount and quality of data directly shackle the results of criminal evidence judgment by artificial intelligence [5]. At present, the data available for the application of artificial intelligence in the judgment of criminal evidence in China mainly comes from the laws and regulations, judicial interpretations, online published judgement documents and so on. However, the data published on China Judgements Online is not comprehensive, the judgement which has not been uploaded to the website can not provide the basis for artificial intelligence for criminal evidence judgment.

Second, Inaccurate data content. In the process of criminal evidence judgment by artificial intelligence, once the data are biased, if the consistency of the application of the rules of evidence is excessively pursued, and the results of the evidence determination of the historical jurisprudence are used as a reference basis, it may result in the adjudication of the pending case repeating the errors of the past evidence review, and deviating from the requirements of the correct adjudication. Different social backgrounds, values, and new circumstances in pending cases may lead to different conclusions on the determination of criminal evidence than in previous cases, requiring the trial judge to make differentiated conclusions. If the trial judges in the pending cases in the evidence judgment mechanically follow the historical case of the argumentation results, they will ignore the particularity of the trial, which can not show their rationality and wisdom. The blind obedience of adjudicators in the identification of evidence in historical cases is actually a one-sided pursuit of justice in the form of the same case and the same judgment. In a more extreme case, if the trial staff is bent on following the results of intelligent adjudication, the programmer can replace the trial staff to become the adjudicator of justice.

Third, the data is not updated in a timely manner. The results of artificial intelligence in criminal evidence judgment are directly affected by the timeliness of data. The untimeliness of data updates directly affects the credibility of the content it generates. If these data fail to reflect the latest legal changes, social conceptual updates, or technological advances in a timely manner, then the judgment of AI may be based on outdated information and produce misleading conclusions. This is the most obvious difference between AI and humans. Humans have the ability to actively acquire knowledge and keep it up-to-date, while AI can hardly reach this level.

### 3.3. Lack of Clarity on the Subject of Attribution of Responsibility for the Miscarriage of Criminal Evidence by Artificial Intelligence

In the examination and judgment of criminal evidence, artificial intelligence can rely on big data analysis to quickly identify the conflict points between the evidence, and can comprehensively consider the evidence chain of the whole case, and present the results of the judgment to the judicial personnel. However, for similar cases, artificial intelligence tends to be consistent in its conclusions. The review of criminal evidence judgment is lack of pertinence, which makes it easy to ignore the unique nature of each specific case. Then, when the artificial intelligence makes mistakes in the process of criminal evidence review and triggers judicial accidents, who should bear the corresponding judicial responsibility? We need to clarify the responsibility of the artificial intelligence system, the developer of the artificial intelligence system and the judicial personnel.

Firstly, there is no doubt that artificial intelligence systems do not have the ability to assume legal responsibility at present. Secondly, whether the developer of the artificial intelligence system can be held liable for the results of judicial decisions on the issue of intelligent evidence judgment system is a difficult problem brought by the application of artificial intelligence to the judicial field. The developer of the artificial intelligence system is responsible for the design and writing of the algorithm, which should ensure the accuracy and stability of the system. However,

if the responsibility for misjudgment of criminal evidence is imposed on the developer of the AI system, the developer assumes judicial responsibility beyond the scope of its contractual obligations, which may reduce the developer's motivation to continue to research and develop the intelligent evidence judgment system, thus hindering the application of AI in the examination and judgment of criminal evidence and the realization of digital justice. Finally, it is worth discussing whether judicial officers should be held responsible for judicial accidents caused by intelligent evidence judgment systems. In the context of judicial accountability system, preventing judicial accidents is an important topic in judicial work. Compared with the traditional criminal evidence review and judgment, artificial intelligence provides a new reference basis for judicial personnel, which reduces the work burden of judicial personnel to a certain extent. However, it should be clear that artificial intelligence is only an auxiliary tool, and judicial personnel still play a decisive role in the examination and judgment of criminal evidence, so judicial personnel should bear the corresponding responsibility for the results of the examination.

#### **4. Recommendations for the Application of Artificial Intelligence in the Examination and Judgment of Criminal Evidence**

In order to further enhance the effectiveness of the use of artificial intelligence in the field of criminal evidence review and judgment, and to ensure the standardization and intelligence of the criminal evidence judgment process, it is necessary to reasonably regulate the specific application of artificial intelligence in criminal evidence review and judgment.

##### **4.1. Clarifying the Use of Artificial Intelligence for Probative Assistance Review**

The application of artificial intelligence in the field of criminal justice is an inevitable trend in the development of science and technology. In the current "human-computer interaction" mode, although the artificial intelligence system has not yet reached the level of the same legal status as human beings, but its function has far exceeded the scope of traditional definition in "tool theory". In fact, artificial intelligence has become an indispensable part of human society [6]. Artificial intelligence is the embodiment of human wisdom in the field of science and technology, but artificial intelligence, after all, can not be equated with human intelligence, artificial intelligence does not have human thinking and life experience, can not simulate the process of judgment of proof, can only assist the trial staff to carry out the review of proof. For example, the Shanghai "206" intelligent system can use deep neural network models and graphic recognition (OCR) technology to digitally and quickly identify key evidence, the credibility of the criminal evidence for the initial assessment, to help the trial staff to deepen the knowledge and understanding of the evidence, and to assist in the comprehensive consideration of the evidence of the case, so as to carry out a holistic evaluation, enhance the efficiency of the trial staff in reviewing the probative value, and reduce the workload of the trial staff. However, the positioning of this intelligent system remains a "case handling assistant". Machine cannot handle the case.

It can be seen that the artificial intelligence can only be in the auxiliary position, to provide directional guidance for the trial personnel, and its judgment results are only for the reference of the trial personnel, and can not replace the judgment of the trial personnel, and shall not be used as a decisive basis. Trial personnel in the use of artificial intelligence, should maintain independent judgment, can not be overly dependent on artificial intelligence. In general, the trial personnel and artificial intelligence complement each other, complementing each other's strengths, the trial personnel can make up for the defects of artificial intelligence without emotional resonance, and the artificial intelligence can assist the trial personnel to review and judge the probative value of the evidence more efficiently and scientifically through the analysis

of big data. The new model of criminal evidence review with human-machine synergy will become a new direction of reform in the field of criminal justice.

#### **4.2. Optimization of Criminal Evidence Databases for Artificial Intelligence**

First, expand the judicial database. Broaden the source channels of judicial data and realize the effective sharing of judicial data [7]. In response to the current problems of incomplete judicial data faced by AI in the review and judgment of criminal evidence, the process of publicizing judicial data such as referee documents should be accelerated by the courts in all regions, and it should be clearly stipulated that, except for the content involving personal privacy, state secrets and other legal non-disclosure, the rest of the judicial data should be made public on the Internet in a timely manner. Corrective measures should be taken for courts that do not make public in a timely manner. At the same time, courts that are in a position to do so are encouraged to organize and enter the historical data of adjudication documents, so as to fully realize the informatization and datafication of adjudication documents.

Second, the review of the data content of criminal evidence should be strengthened. On the one hand, developers of artificial intelligence systems should fulfill their data quality assurance obligations to ensure that data sources are reliable and data content is authentic. In the collection of criminal evidence data, manual review should be strengthened and an artificial filtering mechanism should be set up, and cases judged by past evidence should not be incorporated into the artificial intelligence system without screening. We should focus on considering the professionalism, representativeness and correctness of past cases in terms of evidence review, and accordingly filter out suitable case data. When the results generated by the system show obvious errors or contain sensitive information, high-risk and highly sensitive tips should be given in a timely manner to ensure the accuracy of the information provided. On the other hand, the training of judicial staff applying AI technology for evidence review is strengthened, e.g., training on evidence rules, information security training, etc., to enhance their ability to recognize the results of intelligent evidence judgment. Judicial organs cannot rely on the AI system for all of their duties in reviewing and judging criminal evidence, and should take the initiative to assume judicial responsibility for screening and verifying evidence information.

Third, a mechanism for dynamic updating of criminal evidence data should be established. It ensures that the data reflect the latest laws and regulations and the dynamics of judicial practice, and constantly adapts to changes in the law and new crime patterns. At the same time, we should break judicial data barriers, realize the interconnection of criminal evidence data at the investigation, prosecution and trial stages, ensure the integrity and consistency of the data, promote data sharing among the public prosecutors and lawyers, and improve the efficiency and accuracy of criminal evidence review. At present, China's "206" system in Shanghai and Guizhou Province's political and legal big data information platform have carried out useful explorations in the interconnection of judicial data among the three authorities.

#### **4.3. Maintaining the Status of the Judiciary as a Responsible Body**

Criminal evidence examination and judgment is the basis for the determination of criminal facts and the main basis for criminal adjudication. The application of artificial intelligence in the field of criminal evidence examination and judgment has prompted people to diversify their consideration of judicial responsibility. It triggers people's deep thinking that whether artificial intelligence systems, developers of artificial intelligence systems and judicial personnel can bear the corresponding responsibility. First of all, as a set of computer systems, artificial intelligence does not have the qualification and ability to assume responsibility. The current mechanism for investigating wrongful convictions does not take AI systems as the subject of judicial responsibility. Secondly, the operation of artificial intelligence in the field of criminal evidence cannot be separated from human participation, and the developer of artificial

intelligence plays a crucial role in the design and operation of the system, and is responsible for the repair and maintenance of the system. However, when there is a mistake in the review of intelligent evidence, the responsibility that the developer can assume is limited to the contractual responsibility at the technical level, and cannot assume the judicial responsibility for the ruling mistake. As a developer of artificial intelligence, what needs to be done is to ensure that the core technology is not leaked, and effectively guarantee data security. At the same time to prevent legal risks, effectively protect the user's personal privacy and commercial secrets, and resolutely maintain national information security. Finally, artificial intelligence in the process of criminal evidence review and judgment, should adhere to the status of the main body of the responsibility of the judicial personnel. We should make sure that the adjudicators are responsible for the judgement they make. When judicial officers use artificial intelligence to make decisions, they should sign to confirm. One is to remind the judicial personnel of the review and judgment of the intelligent auxiliary system has the obligation to supervise, to prevent the judicial personnel from slacking in the performance of their legal duties due to the existence of artificial intelligence, and to avoid excessive reliance on artificial intelligence. The second is to show that judicial officers are aware of the process of the intelligent auxiliary system involved in the examination and judgment of criminal evidence, and recognize its output results, and are willing to be responsible for it, thus preventing the responsibility for misjudgment of evidence from being attributed to the artificial intelligence in the future, and avoiding becoming an excuse for judicial officers to shirk their responsibilities.

## 5. Conclusion

China's criminal justice field is actively exploring the application of artificial intelligence, in which the "digital procuratorate", "intelligent court" and "big data case handling", has become a symbol of the intelligent transformation of judicial work. The "Digital Prosecution", "Intelligent Court" and "Big Data Case Handling" have become the symbol of intelligent transformation of judicial work. With the in-depth integration of artificial intelligence and criminal justice, artificial intelligence has achieved remarkable results in the review and judgment of criminal evidence, such as the development of intelligent systems such as the Shanghai Auxiliary Case Handling System for Criminal Cases (206 System) and the Guizhou Big Data Case Handling Platform for Politics and Law, which have achieved full coverage of the online process of criminal cases. Combining artificial intelligence with the examination and judgment of criminal evidence can make full use of the advantages of modern information technology, effectively solve the real problems of "large number of cases and relatively insufficient judicial personnel" and "interdepartmental collaboration barriers", and effectively improve the efficiency of case handling. However, as the degree of application of artificial intelligence grows, it is becoming more and more important to utilize it. However, with the deepening of the application of artificial intelligence, artificial intelligence gradually exposed a series of practical problems. For example, artificial intelligence can not simulate the assessing process of probative value, the construction of criminal evidence database for artificial intelligence is not perfect, the subject of responsibility for artificial intelligence misjudgment of criminal evidence is not clear. In order to solve the above problems, this paper puts forward the suggestions of clarifying the use of artificial intelligence for the auxiliary review of the probative value, optimizing the criminal evidence database oriented to artificial intelligence, and insisting on the status of the main body of responsibility of judicial personnel.

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