



# The Application and Regulation of Artificial Intelligence Technology in Judicial Adjudication

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**Abstract.** In the traditional judicial judgment, the result of the judicial judgment will be affected by the subjective factors of the judge, leading to the injustice of the trial result. Nowadays, artificial intelligence technology is becoming more widely used. The application of artificial intelligence procedures to the judicial judgment will standardize the judicial judgment process and maximize the fairness of the trial results. This paper on the application of artificial intelligence in the judicial judgment has carried on the thorough analysis, put forward the principle of using artificial intelligence technology should follow in the legal process, and lists the current artificial intelligence technology in the judicial field to build judicial database, legal knowledge map and criminal evidence system, expected to give artificial intelligence technology application in the judicial field to provide certain reference.

**Keywords:** Artificial Intelligence Technology · Judicial Adjudication · Application

## 1 Introduction

The judicial adjudication method used in China today is still the traditional method in the past. Although this method has a wide range of applications, it will be affected by many subjective factors during the trial process. During the trial, judges may have a subjective concept of discrimination against groups such as homosexuals and women. This concept will lead to special emotions in domestic violence cases and sexual assault cases, which will affect the results of the trial. This subjective awareness is not conducive to judicial justice. Has strong damage and may even lead to trial error. The judgment of event logic by artificial intelligence technology will not be affected by subjective factors, and the fairness of judicial judgment has been guaranteed to a certain extent. Artificial intelligence technology can also bring convenience to lawyers. When lawyers defend a case, they need to find relevant legal provisions. However, there are many legal provisions in China, and it is very troublesome to search through books. Therefore, a judicial judgment database can help lawyers find legal provisions. Articles and similar case information to assist attorneys in their defense. Although the addition of artificial intelligence to judicial adjudication can bring many benefits, it is still necessary to be alert to the problems that may arise. This article elaborates on the best way to use the advantages of artificial intelligence technology in judicial adjudication.

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## 2 Artificial Intelligence Technology

Artificial intelligence technology has appeared in the middle of the 20th century. After entering the 21st century, with the continuous development and popularization of computer technology, the concept of artificial intelligence has gradually become a craze. Artificial intelligence is a branch of computer technology that has recently become an independent discipline. Artificial intelligence is able to simulate the human thinking pattern and deal with some problems according to this thinking pattern. The direction of artificial intelligence research is very wide, including speech recognition, computer vision, natural language processing, machine learning theory, intelligent control robots, unmanned aerial vehicles, information retrieval and so on.

In recent years, the concept of artificial intelligence has been continuously introduced into various industries. Artificial intelligence technology has gradually entered the judicial field in China, and the development of judicial databases and intelligent case-handling systems has brought good results to the judicial field. It is foreseeable that artificial intelligence technology will be deeply integrated with judicial adjudication in the next development. Some courts in China have gradually launched smart judicial software. People can communicate with court staff on this software, which makes judicial work more convenient, promotes the popularization of legal provisions to a certain extent, and reduces the pressure on judges in handling cases.

Artificial intelligence technology has powerful computing power, rigorous logical thinking and the ability to continuously learn, these advantages make artificial intelligence technology have great advantages in judicial adjudication. In the field of criminal justice, the essence of fact determination is the determination of evidence, and judges may bring in value judgments in the process of determining facts, lacking rational and rigorous logical thinking. The application of artificial intelligence to fact-finding in criminal cases can make up for the logical thinking of judges in the process of fact-finding. With the deepening of artificial intelligence, the situation of unjust, false and wrongful convictions will continue to decrease, and it will save litigation resources and improve litigation efficiency.

## 3 Principles for the Application of Artificial Intelligence Technology in Judicial Adjudication

When applying artificial intelligence technology to the judicial adjudication system, the main pursuit is efficiency and accuracy. In the judicial adjudication system, fairness cannot be ignored for the sake of efficiency. In the process of system construction, the value of fairness should be emphasized [3]. The help that artificial intelligence technology can provide in the field of judicial adjudication includes recommendation of similar cases, sentencing assistance, etc., which will affect the accuracy of conviction and sentencing [13]. The application of artificial intelligence in judicial adjudication should also consider procedural fairness, especially the impact on the litigation rights of the parties. The construction of the system should realize the fairness and legitimacy of the procedure by restricting public power and safeguarding the rights of citizens.

In artificial intelligence judicial adjudication, we must always insist on putting justice before efficiency.

The introduction of artificial intelligence into judicial adjudication may lead to emphasis on instrumental rationality while ignoring value rationality in the judicial adjudication process. The application of artificial intelligence will cause some people to respect absolute rational tools, and then make people give up the pursuit of value rationality, making the law a ruthless and ruthless tool [1]. The importance of people in judicial adjudication is self-evident, and tools cannot be above people. When building a judicial adjudication assistance system, we should pay attention to balancing the relationship between instrumental rationality and value rationality, and emphasize the auxiliary and service functions of instruments.

Natural language processing is an important part of the judicial adjudication system. How to improve the analysis and processing capabilities of natural language is one of the difficulties in the research and development of artificial intelligence systems, and it is also an important development direction in the future. Constructing a legal language knowledge graph will help improve natural language processing capabilities [12]. Knowledge graph is to summarize various concepts and their relationships to form a semantic network system. The purpose of constructing a knowledge map of legal language is to build a forensic linguistics system. Natural language processing is a way of human-computer interaction. It refers to the recognition, analysis, interpretation and use of human language by artificial intelligence systems. It includes automatic Chinese word segmentation, information retrieval, information extraction, machine translation, natural language generation, etc. [9]. The core goal is to enable artificial intelligence systems to understand the meaning of natural language. The construction process of legal knowledge graph is the process of knowledge structuring. In the intelligent judicial adjudication system, the amount of training of natural language processing models such as Word2vec should be increased to improve the accuracy of natural language recognition [11].

Technology companies that develop intelligent judicial adjudication should disclose the operation process of the algorithm, which algorithm is used in the system, and what parameters are used [5]. What data is collected, the goals that need to be achieved, the accuracy of predictions, etc. must be disclosed, except for the specific information of the parties involved in the case and the content related to national security. In the process of developing the system, it is necessary to fully explain and explain the content of the algorithm part, so that judicial staff can understand the procedures and principles of algorithm operation, and accept the supervision of judicial staff. Before the system runs, the algorithm program in it should be reviewed and tested to ensure the fairness and standardization of the algorithm [10] (Fig. 1).

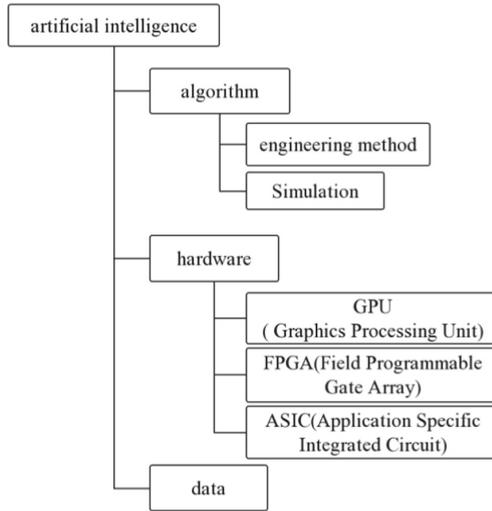


Fig. 1. AI Architecture

## 4 Application of Artificial Intelligence Technology in Judicial Adjudication

### 4.1 Judicial Database

Nowadays, judicial databases in my country have gradually become popular, and judicial databases include case information, electronic files, judgment documents, judicial precedents, etc. [2]. In criminal cases, the case information of different litigation settlements will be integrated into the judicial database, such as case acceptance information, personal information of criminal suspects, and the current litigation proceedings of the case. For the entire case, case information is the basis for handling formal cases, and relevant case information will be stored in the judicial database in the form of data [7]. During the time of criminal justice, the dossier contains a large number of evidence materials and related documents related to criminal suspects, which are too large and difficult to carry. The electronic file can convert the previous paper file into electronic form, and can be combined with video image capture equipment and intelligent case handling system. Electronic files can also provide users with automatic marking of litigation progress, automatic filing and retrieval viewing [6]. The Judgment Document Database collects the judgment documents of the courts at all trial levels, which demonstrates the judicial openness and justice system and facilitates later inquiries. The Supreme Court's guiding cases and some more typical cases are integrated in judicial precedents, and the relevant judicial judgment opinions are sorted out. This information can be used as a reference for case handlers in handling cases and judges in the process of adjudication [3].

### 4.2 Legal Knowledge Graph

Knowledge graphs are now widely used in large-scale knowledge bases. A knowledge graph is a knowledge mapping to the target objective world. The knowledge graph

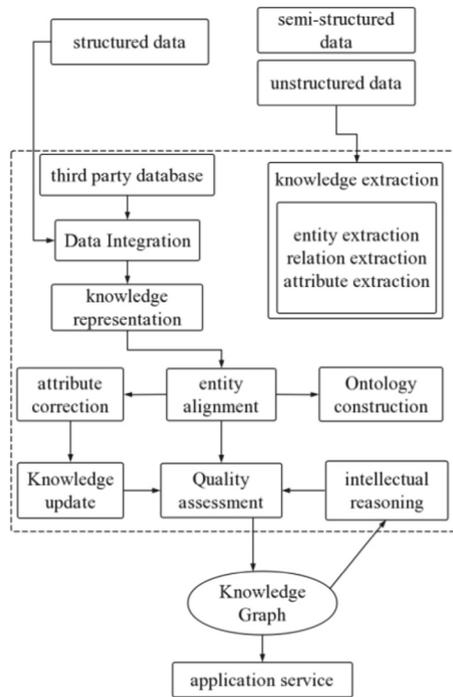
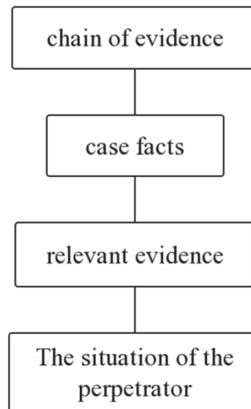


Fig. 2. Knowledge graph construction process

can connect various knowledge points and organize the logical relationship between knowledge as a whole. The legal knowledge graph can transform the legal system into a legal framework, which is beneficial for artificial intelligence to perform logical analysis according to legal terms. There are two ways to build a legal knowledge graph, one can build an expert system, or one can build a machine learning path. The combination of the two methods can better display the knowledge. Building an expert system is to pre-build a knowledge graph model through manual construction, and further build a database. Machine learning, on the other hand, actively constructs a knowledge graph by collecting a large amount of data [4] (Fig. 2).

### 4.3 Criminal Evidence System

The criminal evidence system can examine a single piece of evidence, and can provide a standard of evidence guide function [5]. In judicial practice, it is necessary to verify the authenticity, legality and relevance of a single piece of evidence. The single evidence review in the criminal evidence system can conduct comparative teaching and research on the collected data in terms of procedure, form and content, and automatically generate review conclusions. Judicial staff can make supplementary evidence or explanations based on this conclusion. The evidence standard guidance function in the formal evidence system can formulate standards for the specific evidence of each crime, provide case-handling personnel with unified, standardized, concise, detailed, data-based, full-process



**Fig. 3.** Criminal Case Evidence Model

case-handling guidelines, and provide learning and reference for machine identification and judgment. Standard sample [8] (Fig. 3).

## 5 Conclusions

Artificial intelligence technology can bring higher efficiency and more rational judgment results to judicial adjudication, but in the process of using artificial intelligence technology, we must keep in mind that artificial intelligence technology can only be used as an auxiliary means. In the legal field, we must establish a new state of judicial adjudication based on artificial intelligence technology based on the principle of clarifying the dominance of judges in fact-finding, on the basis of a sufficient and orderly judicial database, and on the premise of ensuring the security of citizens' information and data.

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