

**ROBOT JUDGES, ARTIFICIAL INTELLIGENCE, BIAS MITIGATION AND THE  
FUTURE OF FORENSIC ANALYSIS***Mirzakhakimova Shodiyabegim Mirzohid kizi**Tashkent State University of Law**4th year student of the Faculty of International Law and Comparative Law*

**Abstract:** This article thoroughly examines the role and prospects of using robot judges and artificial intelligence in the judicial system. It discusses how robot judges can contribute to more efficient and rapid decision-making processes while minimizing human biases that may compromise fairness. However, the article also addresses the risks associated with these technologies, including potential errors, algorithmic uncertainties, a lack of human sensitivity, and issues of accountability. The article highlights the importance of carefully analyzing the legal, ethical, and social challenges inherent in the implementation of artificial intelligence in judicial processes. The author emphasizes that the activities of robot judges should not conflict with fundamental principles such as human rights, fairness, and the rule of law. At the same time, it is noted that these technologies can play a significant role in streamlining judicial processes, providing swift data analysis, and ensuring legal stability. In particular, the article examines foreign practices of employing robot judges and explores the prospects for integrating them into Uzbekistan's judicial system. In conclusion, the article offers balanced insights into the opportunities and potential risks of using robot judges and artificial intelligence in the future of judicial analysis. It underlines the importance of establishing clear legal frameworks and implementing cautionary measures to ensure that these technologies serve justice effectively without undermining human rights and fundamental freedoms.

**Keywords:** robot judges, artificial intelligence, judicial analysis, justice, illegality, impartiality, legal system, digital judicial process, judicial reform, automated decision-making, legal stability, technology and law, algorithmic analysis, reducing the burden of judges, legal security, transparency, responsibility, risk of error, quality of judicial decisions, combating corruption.

**Introduction**

**“If an AI can make decisions as good as or better than a human judge, then it should be seriously considered for use as a judge.”**

**Eugene Volokh, Professor of Law, UCLA**

One of the most important factors in the development of humanity in the 21st century has been the widespread development of artificial intelligence (AI) technologies. These technologies have led to major changes in the fields of industry, healthcare, finance and education. In particular, in recent years, the introduction of artificial intelligence into the legal system, in particular the judicial system, has raised not only technical, but also philosophical, ethical and social issues. Scientific research and experimental projects on the concept of a “robot judge” are increasingly increasing worldwide. This graduation thesis is devoted to a comprehensive study of this urgent issue, the activities of robot judges and the future role of courts. Currently, the judicial system is developed in many countries of the world. There is a lot of work, but the resources of judges and other judicial bodies are limited. In such conditions, artificial intelligence technologies are being used to automate judicial proceedings, speed up proceedings

and reduce errors due to the human factor. “Smart” judicial systems of various levels are being introduced in developed countries. For example, the Republic of Estonia has been testing an experimental AI judge to consider small economic claims since 2019. China has also widely implemented “Smart Court” systems, and the practice of developing court decisions in some Internet disputes using artificial intelligence has been established. There are different opinions about robot judges. On the one hand, their introduction will make the judicial system faster, more transparent and more efficient. On the other hand, these technologies raise issues related to legal justice, human rights, ethical responsibility and the risk of algorithmic errors. In particular, aspects such as humanity, empathy, and taking into account the social context in judicial decisions may not be sufficiently expressed by AI. The main purpose of this graduation thesis is to analyze the activities of robot judges from a legal, technical and ethical perspective, and to determine their current place in the judicial system and their future prospects. In recent years, the trend of modernization of public administration and law enforcement using digital technologies and artificial intelligence tools has been increasing. In particular, in the judicial system, opportunities are emerging to reduce the duration of proceedings, reduce human errors, and automate documentation using modern technologies. According to statistics, by 2023, more than 70 percent of the proceedings in the judicial system of the European Union will be digitalized. In China, more than 3 million cases were considered remotely through the “smart court” system in 2021. The scientific novelty of the study lies in the fact that it comprehensively covers the modern approach to the concept of a robot judge, the role of AI algorithms in legal decision-making, and the future transformation of courts. In addition, based on an analysis of existing experience, legal and ethical issues in the introduction of robot judges are identified and proposals are developed to eliminate them. The advantages of judicial systems based on artificial intelligence are undoubtedly speed, efficiency, impartiality, and the implementation of processes free from bureaucracy. However, this There are also problematic aspects of the technology: algorithmic errors, lack of transparency, moral irresponsibility, and disregard for human contexts. For example, the COMPAS algorithm, widely used in the United States, was found to give higher risk scores for black people. This raises the issue of algorithmic discrimination. American scientist Daniel Martin Katz said, “With the help of artificial intelligence, it is not only possible, but also possible to predict court decisions with great accuracy. This allows us to analyze what criteria human judges use when making decisions.”<sup>1</sup> The Republic of Uzbekistan is also actively participating in digital transformation processes. The “Digital Uzbekistan-2030” strategy pays great attention to the automation of public services, including the digitalization of the justice system. In this regard, the issue of introducing artificial intelligence into the judicial system and shaping the activities of robot judges in the future is becoming one of the topical issues. The main goal of this study is to study the legal, technological and ethical foundations of the concept of robot judges in Uzbekistan and to scientifically analyze the direction in which the future functioning of the judicial system may develop. It will also objectively study how robot judges can replace the human factor, their impact on justice, legal trust and independence. US lawyer Eugene Volokh writes about this as follows: “If algorithms can make decisions faster and more accurately than humans, why don’t we appoint them to judicial positions?” At the same time, other scholars, including Anthony Casey and Anthony Niblett, emphasize that these technologies can reduce bias in proceedings, but at the same time they also mention the risk of making wrong decisions. Robot judges can increase impartiality due to their lack of human emotions. John Kleinberg and colleagues say in their study: “With the help of algorithmic adjudication, the entire decision-

making process can be made transparent, which will help to identify and reduce discrimination.” However, such systems lack human empathy and contextual understanding, which can lead to negative outcomes in complex legal cases. 2 Early experiments with robot judges are currently underway in Estonia, China and the United States. For example, some Chinese courts have introduced artificial intelligence systems that review claims online and issue judgments. These systems offer fast and efficient solutions to small financial claims. Estonia is officially recognized as one of the first countries to develop an “AI judge” program. At the same time, democratic oversight, legal accountability and human rights protection remain important issues in the activities of robot judges. Geoffrey Vos, the Chief Justice of England and Wales, puts it this way: “Protecting the right to decide by a human should be included in human rights law.”

### Discussion and Results

Artificial Intelligence (AI) is a set of technologies that enable computer systems to independently perform functions characteristic of human intelligence: learning, logical reasoning, problem solving, speech understanding, and decision-making. The term AI was first officially used in scientific circles in 1956. This date is considered the official birthday of AI. A summer seminar was held at Dartmouth College in New Hampshire, USA. This conference was organized by the famous scientist John McCarthy. He first used the term AI here. John McCarthy is called the father of AI. He said, “It is possible to create a machine that can demonstrate intelligence in any way.” The Logic Theorist program created by Allen Newell, Herbert Simon, and Clifford Shaw at the Dartmouth conference is considered the first practical application of AI. This program was able to prove mathematical theorems. In their book “Artificial Intelligence: A Modern Approach,” Stuart Russell and Peter Norvig define AI as “the science of creating systems that think and act like humans.” They study AI in four categories: systems that think like humans, act like humans, think logically, and act purposefully. AI works primarily on data. It learns, analyzes, and improves itself on large amounts of data. This process is called “machine learning.” For example, AI can learn a lot from court cases and make legal judgments based on their content. A robot judge is an algorithmic system based on artificial intelligence that is designed to perform some or all of the functions of a human judge in a court of law. It can make decisions based on legal norms and make legal assessments. Robot judges are currently being created to speed up court proceedings, reduce human error, automate routine tasks, and assist judges. Czech writer Karel Capek first used the word “robot” in his 1921 play “R. U. R. -Rossum's Universal Robots”. In this play, robots are produced in a factory and replace human labor. Eventually, they rebel. The word “robot” comes from the Czech word “robota”, which means “labor”, “forced labor”. In 1954, American inventor George Devol received a patent for the first industrial robot. In 1961, his robot, called “Unimate”, was put into operation at a General Motors automobile plant. The Unimate performed automated tasks in industrial processes (welding, part transfer). The Unimate is recognized as the world's first working artificial robot. The European Union’s report “The Impact of Artificial Intelligence on the Judicial System” (2019) classifies robot judges as follows: “AI-based judicial decision-making systems are tools that support or replace human judges in analyzing legal documents, assessing claims and drafting decisions.”<sup>4</sup> Frank Pasquale, in his work “The Black Box Society” (2015), emphasizes the importance of transparency and human control of algorithmic decisions and is cautious about the use of robot judges in fully automated trials: “Algorithmic decision-making in law may create opacity and this can undermine the public’s trust in justice.” In China, “robot judges” based on artificial intelligence

have already been put into practice. The Hangzhou Internet Court uses artificial intelligence to hear e-commerce disputes. 9 Estonia is testing AI judges in civil cases up to 7,000 euros. In the USA and Europe, predictive programs based on computer analysis (for example, COMPAS - a system for assessing the risk of crime) are widely used. The advantages of AI in the judicial system are as follows: AI can analyze thousands of cases at the same time. This significantly reduces the time for the court to consider cases. AI makes decisions that are devoid of human emotions. This can reduce errors and bias in some cases. In judicial practice, decisions based on AI can be statistically stable and consistent. AI can advise a human judge based on analytical data, legal norms, and previous court decisions. However, there are a number of risks of making a verdict based on AI: AI does not take into account such vague but important criteria as human empathy and a sense of justice. Who is responsible if a robot judge makes a mistake? The algorithm, the programmer, the judicial system? Many AI systems are like “black boxes”, that is, it is not clear how the decision was formed. Some algorithms work on the basis of incorrect data and, as a result, they are biased towards certain social groups. can make relatively unfair decisions. A robot judge is an automated software tool based on artificial intelligence that participates in the consideration of court cases. It is mainly used in the following areas: Ordinary civil cases (alimony, fines, disputes arising from electronic contracts). Automatic response systems (appeals to the court, application, complaint). Advisory systems (legal positions based on legislation). Robot judges have not yet fully replaced judges. They work more as assistants, but with the development of technology, these boundaries are expanding. AI should not completely replace the activities of a judge. Because a human judge not only applies legal norms, but also: understands the context, takes into account the situation of the party, relies on the principles of humanity, morality and justice. Therefore, the future judicial system may operate on the “human + AI” model: the human judge is the main decision-maker, AI-analyst and advisor.

Attention to artificial intelligence is also increasing in Uzbekistan is increasing day by day. There are also resolutions and decrees on this issue. However, there is no national concept for the development of artificial intelligence, separate laws and codes. By the beginning of 2023, more than 40 countries had adopted national strategies for the development of artificial intelligence. These include the USA, Canada, the European Union, the UK, China, the Russian Federation, Japan, Singapore and other countries. In addition, the first clear ethical standard in the field of robotics, the “Guidelines for the Ethical Design and Use of Robots and Robotic Systems”, was adopted in the UK in 2016. In Europe, the “European Union Ethics Directive” prioritizes the goal of creating reliable and safe artificial intelligence. At the same time, similar ethical initiatives are being developed in China, Canada, the USA and other countries. Such processes will serve not only to develop artificial intelligence, but also to strengthen it legally. By the President of the Republic of Uzbekistan In 2021, decisions were made on the “Introduction of Artificial Intelligence Technologies”. Currently, the e-court system is being developed and some administrative work is being digitized. In the future, AI may also be introduced in Uzbekistan in the following areas: automatic analysis of court archives, optimization of electronic document management, creation of AI systems that provide analytical advice to judges. Artificial intelligence brings new opportunities to the judicial system. It can facilitate human work, speed up court proceedings, and make the delivery of justice more systematic. However, its full implementation without resolving ethical, legal, and technical issues can be dangerous. Artificial intelligence does not have the ability to work on its own. For its effective operation, it needs a large amount of data. Russia is generally seen as a

country that takes a “use but be careful” approach to AI, and has embraced it with a grain of salt in mind, considering its impact on national security. Since 2015, Russia has been investing in the development of the “Safe City” project, a key component of which is a nationwide video surveillance system equipped with automatic data transfer. As part of the project, about 170,000 cameras have been installed in Moscow. Many of them have facial recognition capabilities. The growing confrontation with the West will only accelerate the spread of surveillance-oriented AI software. Surveillance cameras, thanks to facial recognition technology, have proven their effectiveness in the context of a global pandemic. The cameras transmit data to police authorities in real time, and the data provided in this way is a key digital asset for the strong enforcement of quarantine orders. According to reports, Moscow police were able to detect several hundred violations of quarantine regulations using the data. While technology has been effective as a tool in the fight against the deadly coronavirus, there is also a clear risk of misuse or abuse of surveillance.

**Artificial intelligence in the judicial process:** practical application and legal assessment of robot judges

In recent years, artificial intelligence technologies have been actively used not only in the economic and industrial spheres, but also in the judicial system. A number of countries around the world are implementing the concept of robot judges to automate and accelerate judicial activities. The use of artificial intelligence in the judicial system is increasingly developing internationally. Thanks to artificial intelligence, today we are widely using its capabilities to fully automate judicial processes, ensure justice, and accelerate processes in the judicial system. When studying foreign experiences, we should first of all study the experiences of the United States, which is a leading country and a wide user of artificial intelligence. The United States leads the list of countries using artificial intelligence, according to statistics, by 2026 the field of artificial intelligence will be valued at \$ 299.64 billion. The US uses the COMPAS system to analyze and recommend court decisions, which is used to assess the risk of prisoners reoffending. Judges use this system to advise on sentencing. Artificial intelligence analyzes data from laws and case law to help lawyers find important documents. The ROSS INTELLIGENCE and LexisNexis platforms make it easier for lawyers to work with documents.<sup>8</sup> The use of artificial intelligence in China’s judicial system is actively developing, and China is also widely using it to improve the efficiency of its legal system. For example, some court cases are being resolved with the help of artificial intelligence. “Internet courts” are based on artificial intelligence, and users can apply and resolve their disputes online. According to statistics, in 2022-23, private investment in artificial intelligence in China will amount to \$95 billion. The government is also actively investing in artificial intelligence. By 2027, the country's government investment is expected to reach \$38.1 billion, 9% of the world's total. Estonia is testing the use of digital courts, which will provide judges with the ability to automatically review cases when resolving small disputes, which will help save time and money. The e-government system automates the process of applying to the court using artificial intelligence. In Estonia, courts are analyzing data using artificial intelligence when making judgments. For example, there are systems that provide recommendations for judges by analyzing similar cases and previous decisions. This helps to issue court decisions quickly and accurately, and also increases the efficiency of the system. In India, artificial intelligence is being used to sort and prioritize documents in courts with a large number of cases. Supreme Court AI Project The Supreme Court of India is currently testing artificial intelligence to analyze court practices and reduce court proceedings. According to statistics, the Supreme

Court of India is using AI technologies to translate important court decisions into local languages, and more than 36,000 decisions have been translated into Hindi and more than 17,000 into English, which are available on the e SCR portal. The process of using AI in the Canadian judiciary is being carried out in a careful phased manner. 2022 was a full year of implementation of Canada's latest AI policy for the Federal Court. To date, no Chief Justice in Canada has said a firm "no" to the use of AI in the courts. By 2024, it has issued guidelines on the use of AI. These guidelines aim to ensure transparency, judicial independence and fairness in the use of AI technologies in the judiciary. Digital transformation is changing all areas of the world. Technologies such as artificial intelligence, big data, machine learning, and algorithmic analysis play a leading role in this. Even a conservative system like the judicial system is not immune to these changes. Today, forensic analytics is actively used by law enforcement agencies, judges, lawyers, and researchers to improve legal decisions, monitor judicial activity, and ensure justice. The main essence of forensic analytics is the digital analysis of court cases, court decisions, court activities, and other relevant factors. Through these analyses, it is possible to determine the current state of the judicial system, reduce the likelihood of erroneous decisions, and increase the efficiency of the system. This chapter provides an in-depth analysis of the future possibilities of forensic analytics, current problems, and ways to overcome them. While traditional court decisions are often based on subjective opinions, new analytical methods allow judges to base their decisions on concrete facts, statistics, and past precedents. Cognitive AI models allow judges to analyze similar cases and make judgments that are consistent with their outcomes. For example, the COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) system used in the United States is used to predict the likelihood of reoffending. This system serves as an analytical tool that influences the judge's decision.

### CONCLUSIONS AND SUGGESTIONS

By the 21st century, artificial intelligence technologies are widely penetrating all aspects of our lives, including the legal sphere and the judicial system. Based on the analyses conducted during this scientific study, statistical data, and international experience, it can be said that artificial intelligence and robot judges can be an important tool in increasing the efficiency of the judicial system, reducing errors due to the human factor, and strengthening citizens' trust in the courts. However, there are a number of complexities and problems in the implementation of this technology, which require in-depth study and solution. The main task of the judicial system is to ensure justice. This process should be carried out not only technically correct, but also on the basis of ethical, social, and legal criteria. Artificial intelligence, of course, can outperform humans in tasks such as automating court cases, reducing the workload of judges, performing rapid legal analysis, and predicting legal risks. But relying solely on algorithms to deliver justice in the form of decisions poses a great risk. Human values, constitutional rights, and criteria of impartiality may not always be fully taken into account by artificial intelligence. The experience of a number of foreign countries analyzed in the study shows that artificial intelligence is being used in different approaches. While AI technologies have been introduced into judicial activities on a large scale in China, caution is a priority in Western countries. For example, Estonia has introduced robot judges to handle small-scale disputes, but the power to make a decisive decision still remains with a human judge. In France, AI systems play an auxiliary role, and legal responsibility remains with humans. Such approaches confirm the need for caution in introducing AI into the judicial system. Turning to the experience of Uzbekistan, although a digital court system, electronic document management, and "e-court" systems have

been introduced in the country, the full integration of artificial intelligence is still at an early stage. Consistent reforms are expected in this area in the coming years. Significant steps are being taken to digitize the judicial system through decrees of the President of the Republic of Uzbekistan and relevant regulatory legal acts. However, it is necessary to deepen the scientific and technical infrastructure for issuing decisions based on AI, algorithmic justice, and granting legal status to robot judges. The main problems identified during the study are as follows:

1. AI systems issue decisions based on a database. If this data is biased or discriminatory, the results may be unfair.
2. The legal force of decisions made by robot judges, the scope of their responsibility are not clearly defined.
3. AI does not understand human emotions, feelings, and contextual details. Therefore, decisions made solely through an algorithmic approach can sometimes be far from humane.
4. Judicial bodies lack the necessary technical base, qualified programmers, and judges to use AI technologies.
5. AI models are required that can explain court decisions. Otherwise, citizens will not understand how decisions are made, which will reduce trust. However, it is also necessary to recognize the positive aspects. With the help of artificial intelligence: the workload of courts will be significantly reduced; the speed of judicial review; the possibility of more impartial decisions through statistics and document analysis increases; the provision of online services to citizens improves. In the future, it is advisable to use robot judges only in the consideration of a small number of disputes and fines, in document analysis, evidence management, and in the adjustment of laws and practices. However, in decisive cases that affect human life and freedom, human judges, not robots, should play the main role. International regulatory documents, including the AI codes of ethics developed by the Council of Europe and the UN, emphasize the need to constantly pay attention to the principles of “human control”, “explainability” and “accuracy of responsibility” when using artificial intelligence. In conclusion, artificial intelligence and robot judges are one of the important factors determining the future of the judicial system, and their correct and targeted introduction will allow to increase justice, transparency and efficiency. However, caution, a gradual approach and constant monitoring are of great importance in this process. Optimal cooperation between humans and artificial intelligence is currently one of the most pressing problems of the modern legal system. The introduction of artificial intelligence technologies into the judicial system is considered not only a technical achievement, but also the beginning of a new era of legal and cultural changes. These changes are closely related to the requirements for reducing deep socio-bureaucracy in the legal sphere, ensuring convenient and equal access to legal services, minimizing human errors and ensuring procedural justice. It is these aspects that justify the need to introduce robot judges and artificial intelligence. However, the modern judicial system requires not only “mechanics: the application of law, but also behavior, morality, empathy and understanding of the social context. It is these factors that are one of the main weaknesses of robot judges. AI algorithms, in their current state, cannot sufficiently absorb human qualities - for example, compassion, contextual assessment, principles of social justice. This sharply limits the possibilities of robot judges, especially in sensitive areas such as civil, family, juvenile and criminal cases. Another important aspect is that technologies based on artificial intelligence often operate in the form of a “black box”, that is, they do not fully explain how the decision was made. And the fact that court decisions are well-founded, understandable and verifiable is an important requirement of a democratic legal state. If it is not known to the citizen how the

court decision was made, this violates not only the principle of transparency, but also justice. In this regard, fundamental questions arise:

- 1) artificial Are there legal and ethical grounds for the intelligence to make a fair decision?
- 2) Does the authority to make a court decision depend only on the inherent characteristics of the human mind?
- 3) Who is responsible for the mistakes of a robot judge - the manufacturer, the judiciary or the state?

The world scientific community has not yet been able to give a unanimous answer to these questions. Therefore, today many countries are cautiously introducing artificial intelligence into the judicial system. For example, the European Union, having developed the “AI Act” project in 2021, declared the use of AI in the judicial system a “high-risk area” and stated that it requires strict regulation in this area. Also, a special approach is needed for developing countries, in particular Uzbekistan, on the issue of AI and robot judges. For these countries, the limited technological development capabilities and resources, as well as the lack of clear procedures in this regard in existing legislation, remain an important problem. Therefore, the following strategic approaches are proposed:

- 1) Phased implementation - first, AI should be introduced for auxiliary functions (for example, monitoring procedural deadlines, sorting archival documents, statistical analysis), and then move on to more complex tasks.
- 2) A special law should be adopted that determines the legal force of decisions made by AI.
- 3) AI should develop ethical criteria for judicial proceedings with the participation of judges, lawyers, programmers and representatives of civil society.
- 4) AI systems should be created on the basis of explainable AL models.
- 5) Regular monitoring of the operation of AI tools by independent experts, civil society and the media should be established. At the same time, in scientific circles, the approach of considering robot judges not as a complete alternative to human judges, but as an auxiliary tool is gaining priority. In this regard, the “hybrid judicial system” model - that is, the joint work of artificial intelligence and a human judge - is the most optimal solution.

#### **Practical suggestions**

1. Gradually recognize the legal subjectivity of artificial intelligence. First, develop an international legal norm on granting the status of a legal subject under limited liability, first as an “automatic legal instrument”.
2. Create a hybrid judicial system (human + AI). Decisions are analyzed in more depth through the “duo-judge” model, where a person and AI jointly make decisions. AI analyzes facts and laws, and a person evaluates ethical and contextual aspects.
3. Create a “Decision Coordination Module” that automatically checks the internal consistency and compliance of court decisions with general practice using AI. This module identifies differences in decisions made in similar cases and issues warnings to the judge (predictive consistency check).
4. Implement an AI judicial system based on Ethical Neural Networks. These algorithms study human moral principles and take them into account when making decisions (for example, based on utilitarianism or deontological approaches).
5. Develop an international standard for the requirements of algorithmic interpretation of AI judgments (Algorithmic Due Process). The basis on which each decision was made must be fully disclosed, and mechanisms for appeal must be available.

6. Create legal normative analysis systems based on AI and introduce a system for identifying conflicts in legislation. The robot judge will identify discrepancies and conflicts between laws and make recommendations to legislative bodies to eliminate them.
7. Introduce an “ethical audit” of the work carried out by AI. Every year, an independent ethics council will analyze the work carried out by robot judges and publish open reports.
8. Model “career stages” in the judicial system for forecasting using AI. For example, using AI to predict the likelihood of committing a crime, the likelihood of being investigated, and what action will be taken in court.
9. Develop an “artificial empathy module” for robot judges. Through this module, AI can assess not only facts, but also people’s mental state, stress level, and social context.
10. Establish a legal innovation center: “AI & Justice Lab” This center will develop experiments, prototyping, ethical evaluation, and testing systems related to artificial intelligence in the judicial system.

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