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THE ROLE OF ARTIFICIAL INTELLIGENCE IN CRIMINAL JUSTICE SYSTEM

Mayuri S. Chauray
LL.M Student (second year)
NTVS's SBBR COLLEGE OF LAW, NANDURBAR, MAHARASHTRA.
Dr.Asha R. Tiwari.
Associate Professor,
NTVS's SBBR COLLEGE OF LAW, NANDURBAR, MAHARASHTRA.

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Abstract:

The rapid advancement of Artificial Intelligence (AI) has significantly transformed the criminal justice system, revolutionizing policing, judicial processes, and evidence evaluation. AI-driven technologies such as predictive policing, facial recognition, and automated risk assessment have improved efficiency, crime detection, and decision-making accuracy. However, these developments also raise critical ethical, legal, and social concerns, including algorithmic bias, data privacy violations, lack of transparency, and the potential erosion of public trust in legal systems. The research highlights that while AI offers unparalleled potential to enhance criminal justice, its implementation requires robust regulatory frameworks, human oversight, and adherence to ethical standards to ensure fairness and protect fundamental rights. The study also emphasizes the importance of international cooperation, ongoing research, and public engagement to establish AI governance mechanisms that promote justice and accountability. Policymakers, law enforcement agencies, and judicial authorities must collaborate to harness AI's benefits while mitigating its risks to build a criminal justice system that balances technological innovation with human rights and the rule of law

Keywords: Artificial Intelligence, Criminal Justice, Predictive Policing, Algorithmic Bias, Facial Recognition, Evidence Evaluation, Data Privacy, Legal Framework, Ethics, Transparency, Public Trust, Human Rights, AI Governance

INTRODUCTION TO AI IN CRIMINAL JUSTICE

Artificial intelligence (AI) has revolutionised system optimisation, decision-making, and task completion in many industries. AI is improving the criminal justice system, one of society's pillars, faster and more accurately. AI has many uses in criminal justice, from biometric identification and predictive policing to legal research and AI-assisted decision-making. Long-term, these tech advances may change court, correctional, and law enforcement operations, affecting crime prevention, investigation, and rehabilitation.AI in criminal justice is driven by the need to process[1] massive amounts of data and make real-time decisions. Social media, forensic evidence, surveillance footage, and criminal records are some examples of the massive datasets that law enforcement agencies receive. Traditional methods of investigation are inefficient and slow because of the massive amount of data, which causes a delay in the determination of criminal activity. With the help of machine learning algorithms and big data analytics, artificial intelligence-powered systems are able to analyze patterns, recognize suspects, and predict criminal activity with an impressive degree of precision. When prejudice is eliminated through the use of AI, the playing field in the courtroom is also leveled. Although the criminal justice system strives to be objective, it is possible for unconscious biases to influence the decisions that are made. When ethically programmed, artificial intelligence has the potential to reduce biases by providing insights that are driven by data and ensuring consistency in decision-making. In order to guarantee that artificial intelligence will assist in the administration of justice, we need to address issues of algorithmic bias, invasions of privacy, and ethics.

[1] Puneet G, Reeta S. The role of artificial intelligence in improving criminal justice system: indian perspective. Legal Issues in the digital Age. 2020(3):78-96.

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SCOPE AND LIMITATIONS

Scope of the Study

- **AI Applications in Criminal Justice** – This study examines into how artificial intelligence (AI) can be used to improve case evaluation, forensic analysis, biometric identification, predictive policing, and judicial decision-making.
- **Impact on Law Enforcement** – The study looked at how AI can be used to make crime prevention, surveillance, and investigations better while also addressing concerns about how reliable and useful it is.
- **Judicial and Legal Implications** – The study examines AI-assisted judicial ethics and its effects on automated case evaluations and sentencing suggestions.
- **Ethical and Legal Challenges** – Key issues include finding issues with algorithmic bias, data privacy, accountability, and the chance of wrongly convicted people because of AI mistakes.
- **Crime Prevention Strategies** – This study examines AI's role in crime prevention and predictive crime analytics.
- **Comparative Analysis** – As part of the study, AI rules and best practices from different legal systems are looked at in order to come up with good policies for the responsible use of AI.

Limitations of the Study

- **Dependence on Secondary Data** – The study mostly uses literature, case studies, and reports that have already been written instead of collecting its own data directly.
- **Lack of Real-Time AI Implementation Data** – AI is always changing, so there isn't a lot of real-time information about how it will affect criminal justice systems in the long run.
- **Ethical and Legal Variability** – AI regulations and ethical considerations vary across jurisdictions, making it difficult to generalize findings universally.
- **Technological Constraints** – AI is still changing quickly, so the study might not include the newest ideas and innovations.
- **Bias in AI Systems** – The study acknowledges that AI models are trained on historical data, which may reflect inherent biases that impact their decision-making.
- **Limited Focus on AI in Corrections** – The study examines at AI in rehab and prisons, but the main focus is still on how it can be used in law enforcement and the courts.

Significance of the Study

AI could improve criminal justice speed, accuracy, and fairness. Evidence analysis, investigations, and court verdicts can be time-consuming and error-prone. Deepfake detection, forensic AI, and predictive analytics can help police solve crimes, clear backlogs, and prevent wrongful convictions. AI automating complex data processing and understanding crime trends improves judicial system reliability. Political, law enforcement, and legal professionals will benefit from this study. These findings can help lawmakers establish explicit AI standards for criminal justice. This will ensure that AI technologies don't violate rights or propagate biases. Artificial intelligence for digital forensics, surveillance, and crime detection can help police save resources and keep the community safe. AI algorithms that evaluate evidence can assist courts and lawyers make fairer rulings and reduce legal errors. Despite its benefits, the study raises concerns about privacy, algorithm unfairness, and the need for human oversight of AI judgments. The importance of balancing technology with ethical and legal protections is the focus of this research on responsible AI use in criminal justice. The paper explains how to employ AI in law while protecting justice, fairness, and basic rights

LITERATURE SURVEY

Findings & Analysis

Lawyers, forensic experts, and law students in the Indian criminal justice system were surveyed about their knowledge and opinions on artificial intelligence (AI). The results are organized by demographics, knowledge and application, perceived benefits, difficulties, and cross-industry comparisons.

Demographic Information of Respondents

The survey included 20 respondents from different professional backgrounds. The distribution of respondents is shown in Table 1.

Table 1 : Demographic Breakdown of Respondents

Profession	Number of Respondents	Percentage (%)
Police Officers	5	25%
Legal Professionals	6	30%
Forensic Experts	4	20%
Law Students	5	25%
Total	**20**	**100%**

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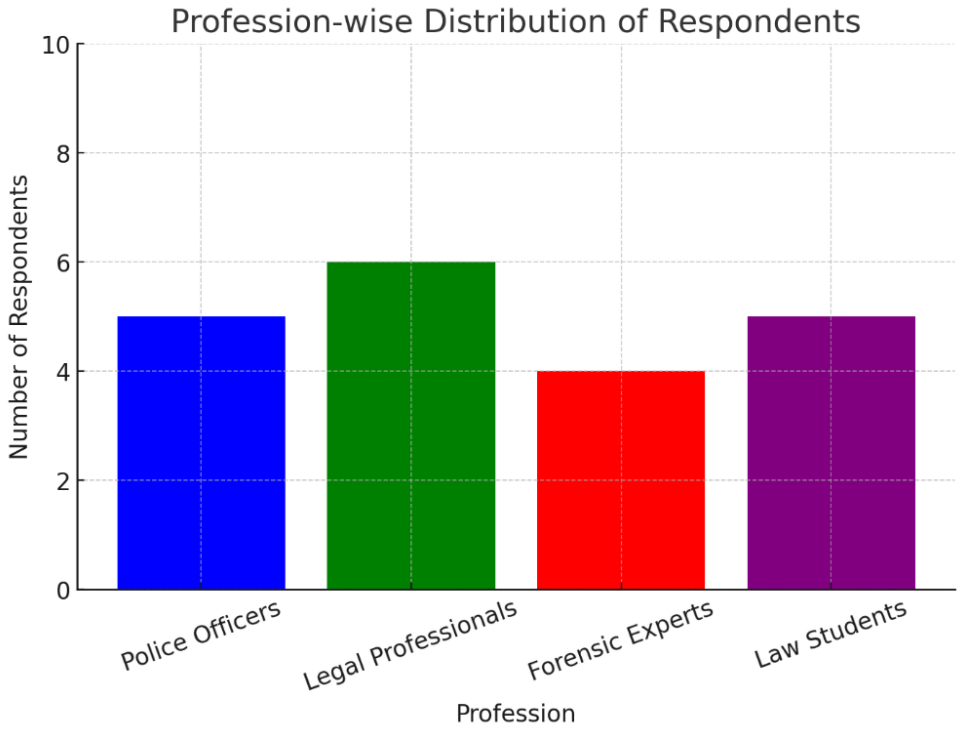

Figure 1: Profession-wise Distribution of Respondents

Awareness and Usage of AI Tools

The survey assessed the **awareness and usage** of AI tools in the criminal justice system. The findings indicate that **70% of respondents are aware** of AI applications in law enforcement and judiciary, while **only 40% have directly used AI-based tools** in their professional work.

Table 2 : Awareness and Usage of AI Tools

Category	Aware of AI (%)	Have Used AI (%)
Police Officers	80%	60%
Legal Professionals	75%	50%
Forensic Experts	60%	30%
Law Students	65%	20%

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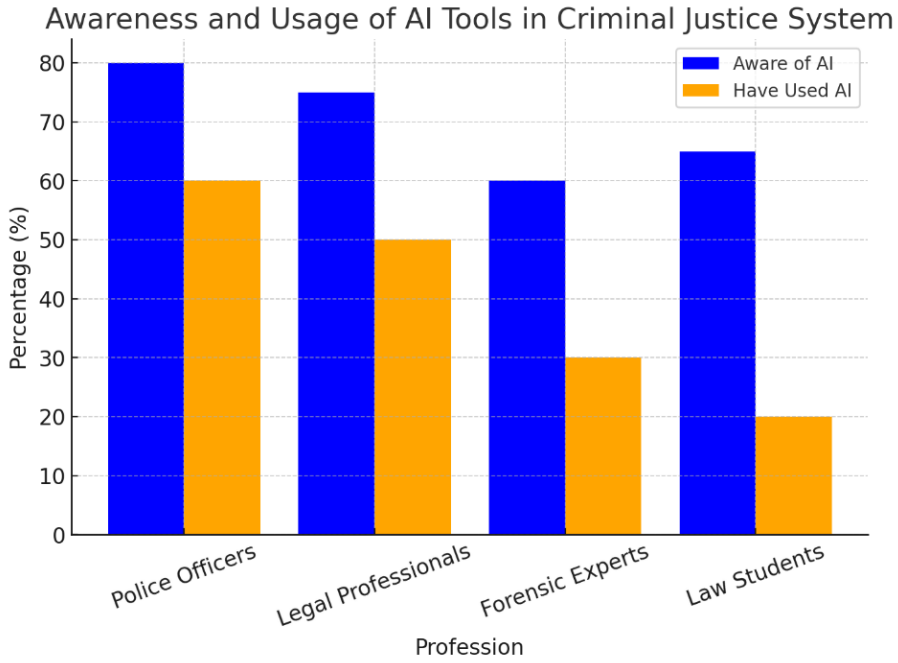

Figure 2: Awareness and usage of AI Tool

Perceived Advantages of AI in Criminal Justice

Respondents identified several key benefits of AI in law enforcement, judiciary, and forensic investigations. The most frequently mentioned advantages were **crime prediction (65%), case analysis (70%), and legal research (80%)**, as shown in Table 3.

Table 3 : Perceived Advantages of AI in Criminal Justice

Advantage	Percentage of Respondents (%)
Crime Prediction	65%
Case Analysis	70%
Legal Research	80%

Challenges in AI Adoption

Despite the advantages, respondents highlighted **several challenges** associated with AI integration in the criminal justice system. The most critical concerns include **bias in AI algorithms (60%), accuracy and reliability (55%),** and**ethical concerns (75%)**, as outlined in Table 4.

Table 4 : Challenges in AI Adoption

Challenge	Percentage of Respondents (%)
Bias in AI	60%
Accuracy Issues	55%
Ethical Concerns	75%

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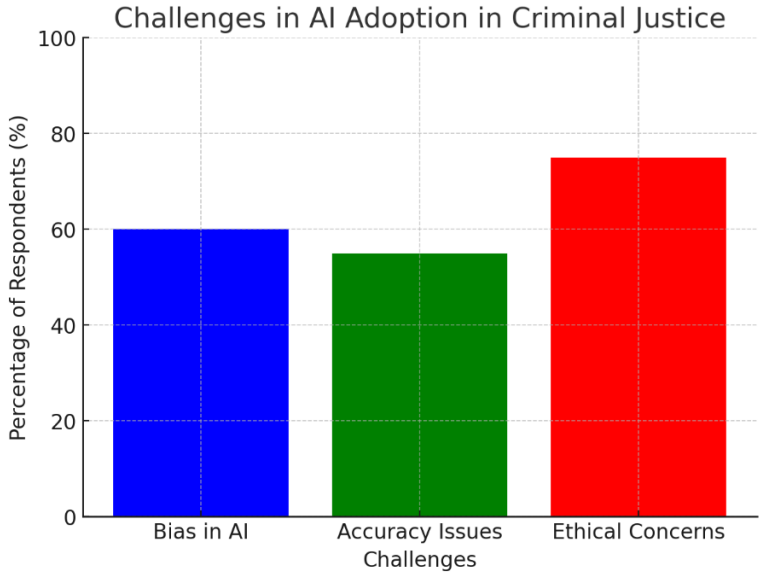

Figure 3: Challenges in AI Adoption

To understand stakeholders' AI views, responses were analyzed by profession. Police officers held the most optimistic view of AI's role in crime prevention, despite concerns about accuracy. Legal experts emphasize AI's potential for legal research, despite ethical concerns. AI can be biased, but forensic experts use it for evidence analysis. Law students understand AI's potential but lack practical experience. These differences demonstrate how AI training for specific professions and policy changes can benefit the Indian criminal justice system. According to this study, AI's role in the Indian criminal justice system is mixed due to high awareness but low practical use. While forensic experts value AI's role in processing evidence, law students are unfamiliar with the technology and its applications, highlighting the need for AI-based legal training. Police and lawyers recognize AI's potential in crime prediction, case analysis, and legal research. Consistent with global discussions on algorithmic bias and justice in AI-driven police enforcement, bias, accuracy, and ethics are the main barriers to AI adoption. China uses face recognition technology, and the US and UK use AI-driven predictive policing, raising ethical concerns about racial bias. This study is important because artificial intelligence (AI) is still developing in India and there is little empirical research on its practical effects. The diverse reactions to AI adoption show the need for thorough regulation. A data privacy law to prevent illegal AI surveillance, standardized AI training for legal professionals, regulatory oversight to ensure constitutional rights compliance, and an ethics framework to promote fairness and accountability in AI are examples. Audits reduce bias too. Following these steps, India can maximize AI's potential and improve its criminal justice system.

AI's involvement in criminal activities

Recently, AI's rise in illegal activity has worried India's legal system. New cybercriminals use AI algorithms to commit complex hacking, cybercrimes, and other crimes. The justice system struggles to identify and punish AI-motivated crimes. Law enforcement struggles to identify attack sources and perpetrators due to anonymizing and AI-based evasion methods. Autonomous and seemingly self-directed AI algorithms complicate responsibility and accountability, complicating the legal landscape surrounding AI's criminal activity. AI improves disease diagnosis accuracy and speed. AI systems could detect anomalies in medical images like X-rays, CT scans, and MRIs to help diagnose disease early. Artificial intelligence analyzes patients' genetics and medical history[2] to create personalized treatment plans. Treatments may be safer and more effective. Telemedicine became more popular in India during the COVID-19 pandemic, and AI made online doctor visits more productive. AI-powered diagnostic tools and remote monitoring systems were used to treat patients. AI is helping doctors find patterns in mountains of data to better understand disease and treatment. AI affects drug discovery and development. It could search massive datasets for promising drug candidates and predict their efficacy, speeding up drug

[2] Srivastava SK. AI for Improving Justice Delivery: International Scenario, Potential Applications & Way Forward for India. Informatica. 2023 May 8;47(5).

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development. If it makes a mistake due to human error, AI could commit a crime, even if doctors or creators don't mean damage.

Due to mens rea, carelessness is required. Criminal AI use will have far-reaching effects on Indian data security and privacy. Criminals use AI algorithms to steal and abuse personal data, endangering security and privacy. The legal community is understandably concerned about data breaches and unauthorized access to sensitive information as industries increasingly use AI. Since AI-driven crimes are becoming more complex and widespread, legal frameworks must change to protect citizens' data and enforce data privacy laws. AI may deepen judicial system biases and disparities[3], which is another aspect of its role in illegal activities. AI algorithms used in predictive policing and law enforcement may unintentionally reinforce biases and target certain communities or individuals. This requires a thorough legal investigation and regulation of AI applications to prevent human and civil rights violations. The Indian justice system must be proactive to maintain fairness and justice while using AI technology.

Criminal liability framework in India

Based on the criminal liability framework, Indian law specifies when lawbreakers can be punished. A person is legally liable for criminal offenses if they face fines, jail time, or other penalties. Indian criminal liability is based on constitutional, statute, and case law principles. Indian criminal liability is based on mens rea, the accused's mental state or intent at the time of the crime. Thus, to be criminally responsible[4], one must have acted with a guilty mind, either intending to commit the crime or knowing it was wrong. Mens rea distinguishes deliberate from accidental actions when sentencing. India's main criminal law is the 1860 Indian Penal Code (IPC). The IPC classifies crimes and sets punishments based on severity. It also lists the conditions that make murder, theft, fraud, and assault illegal. Insanity, drunkenness, mistake of fact, self-defense, and intoxication are IPC defenses. India's criminal liability system relies on the presumption of innocence. Thus, the prosecution must prove guilt beyond a reasonable doubt. To ensure a fair trial, the accused has the right to remain silent, an attorney, and a public and expedited trial. Indian corporations and other legal entities are criminally liable. Vicarious liability, the foundation of corporate criminal liability, holds the company liable for an employee's crime if it is directly related to the company's operations and the employee's goal is to benefit the company. Artificial intelligence and other cutting-edge technologies have made India's criminal liability system more difficult in recent years. As AI systems become more sophisticated and autonomous, concerns about their legal liability arise. No law governs AI in India, but there are proposals to amend the Information Technology Act to include AI provisions. Legal personhood for AI systems is still debated because it affects AI creators, operators, and consumers' liability. A crime requires an act, and whoever controls the AI will be held responsible for its misdeeds.

Pros and Cons of AI in The Criminal Justice Field

The application of AI in criminal proceedings has been the subject of numerous studies around the globe. According to some of these research, AI offers great opportunities to standardize, predict, and make the legal system more open and accessible. In the meanwhile, other research shows that AI is a major cause for concern in the IT industry because of the software limitations that exist. Government officials[5] and legal entities involved in criminal and civil proceedings should be cognizant of the advantages that AI could bring and closely monitor its progress and efficacy in real time, considering both of these factors. When handling criminal cases, the accused's intent is crucial. Many things influence human behavior that AI can't possibly account for.

Many things must be considered in order to carry out an investigation, including the individual's background, level of education, perception of guilt, and other traits. The criminal justice system must never disregard the privacy of individuals or their dignity. Therefore, it is thought that AI wouldn't be capable of dealing with all these issues that crop up during criminal trials. Successful applications of artificial intelligence include data processing for statistics, assistance with the compilation of legal documents, website exploration for information, and determinations regarding the qualification of criminal acts. Anyone with a stake in the matter should be able to cast doubt on the wisdom of using AI algorithms, the practical relevance of its various components, and the soundness of the results. Thus, courts should decide on the use of AI in CJS.

[3] Mali S. Expedition of AI in Legal Services: Opportunities & Challenges in India. Part 1 Indian J. Integrated Rsch. L.. 2022;2:1.

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[5] Taylor SM, Gulson KN, McDuie-Ra D. Artificial intelligence from colonial india: Race, statistics, and facial recognition in the global south. Science, Technology, & Human Values. 2023 May;48(3):663-89.

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Crime, law, and forensics have all seen a rise in the use of AI due to its predictive capabilities. These days, the police frequently employ algorithmic risk assessments. The use of assessments and predictive policing is increasing in the effort to foretell who will commit crimes and who will show up in court. Additionally, all areas of criminal justice administration are being profoundly affected by the worldwide digital revolution of the past decade. Both the nature of crimes perpetrated and their investigation are evolving in response to the shift to a digital culture. This abrupt digital transition has affected our duty to deliver justice. With the advent of digital technologies, we now have rapid and easy access to data, as well as new investigation systems that rely on mining and analyzing massive amounts of data. As a result of the 2019 pandemic, the courts were fully digitalized, allowing unfettered access to any necessary legal data.

Developments in the field of AI and CJS in India

Artificial intelligence (AI) has seen significant growth in its application across multiple domains in India. An illustration of this can be seen in the 'National Strategy for Artificial Intelligence #AI4ALL' article published by the NITI Aayog, which aims to raise awareness about the need for supervised and ethical use of AI. It focuses on five important areas in India that could benefit from AI: healthcare, education[6], smart cities and infrastructure, smart mobility, and transportation. After establishing rudimentary ICT infrastructure through the eCourts Project, the Indian judiciary is now attempting to capitalise on AI's capabilities. Two programs have been developed and tested by the AI committee of the Supreme Court. To begin, the Supreme Court Vidhik Anuvaad Software (SUVAAS) has been launched as a neural translation tool that can translate judicial documents between English and nine different languages. Second, SUPACE, an administrative tool for the Supreme Court that facilitates data mining, case tracking, legal research, and related tasks... In an effort to boost institutional efficiency, this is already in the works in various parts of the world. So, it's clear that AI is already making its way into the legal industry, and it's expanding quickly.

Finally, global collaboration is needed to standardize criminal justice AI oversight. Since AI technologies are becoming global, countries should collaborate to set ethical standards for their development and use. The EU and UN, among others, can promote discussion, best practices, and structures to ensure AI systems comply with international law and human rights.AI in jails has pros and cons. Effective AI use requires strong legislative and regulatory frameworks that respect human rights, transparency, and equity. Create criminal justice-specific AI ethics guidelines, reduce algorithmic biases, increase transparency, guarantee human oversight, create independent oversight bodies, protect data privacy, and encourage public engagement to develop trustworthy AI systems. Communities can ensure AI improves legal justice, efficiency, and equity by implementing these strategies.

CONCLUSION AND RECOMMENDATIONS

The use of AI in the criminal justice system has changed many parts of law enforcement, court procedures, and the evaluation of evidence. For the sake of justice, fairness, and protecting human rights, we will have to be very careful as we deal with the big problems that this technological change has caused. This chapter talks about the consequences and issues that come with using AI in criminal justice in a responsible and moral way. It also imagines what the future might hold and suggests policies that could help make this happen.

Future Prospects of AI in Criminal Justice

The study talks about how AI is changing the criminal justice system, especially how police work, how the courts work, and how evidence is judged. Artificial intelligence-powered predictive policing systems have made it possible for police to look at huge amounts of crime data. By doing this, they can see patterns, which helps them come up with better ways to stop crime. Face recognition technology makes it possible to quickly identify suspects, and AI-powered surveillance systems have made the public much safer. The study did find, however, that these tools often make people worry about algorithmic bias, privacy invasion, and racial profiling.AI has made court work much more efficient and effective by giving lawyers new tools for researching the law, analyzing cases, and making decisions automatically. Recently, there has been a rise in the use of algorithms that can guess whether someone will break the law again and then suggest bail or sentencing based on that guess. Despite this, the results show that relying on AI to make decisions could limit the power of judges and, if algorithms are biased, could make social problems last longer.AI has also been very helpful in the process of evaluating evidence. Artificial intelligence (AI)-powered forensic tools can look at digital evidence quickly and correctly, spot deepfakes, and verify documents. However, there are still concerns about the reliability and validity of AI-generated evidence, especially when the methods used are not made clear or when lawyers do not have the right training to understand the results. While artificial

[6] Samartha RR. Artificial Intelligence and Human Rights: Legal Implications and Challenges in India. Issue 4 Indian JL & Legal Rsch.. 2022;4:1.

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intelligence (AI) has the potential to make the criminal justice system much more accurate and streamlined, the study stresses that there must be safeguards in place to ensure fairness and accountability before it can be used.

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