



INTERNATIONAL LAW
JOURNAL

**WHITE BLACK
LEGAL LAW
JOURNAL
ISSN: 2581-
8503**

Peer - Reviewed & Refereed Journal

The Law Journal strives to provide a platform for discussion of International as well as National Developments in the Field of Law.

WWW.WHITEBLACKLEGAL.CO.IN

DISCLAIMER

No part of this publication may be reproduced or copied in any form by any means without prior written permission of Editor-in-chief of White Black Legal – The Law Journal. The Editorial Team of White Black Legal holds the copyright to all articles contributed to this publication. The views expressed in this publication are purely personal opinions of the authors and do not reflect the views of the Editorial Team of White Black Legal. Though all efforts are made to ensure the accuracy and correctness of the information published, White Black Legal shall not be responsible for any errors caused due to oversight or otherwise.

WHITE BLACK
LEGAL

EDITORIAL TEAM

Raju Narayana Swamy (IAS) Indian Administrative Service officer



Dr. Raju Narayana Swamy popularly known as Kerala's Anti-Corruption Crusader is the All India Topper of the 1991 batch of the IAS and is currently posted as Principal Secretary to the Government of Kerala. He has earned many accolades as he hit against the political-bureaucrat corruption nexus in India. Dr Swamy holds a B.Tech in Computer Science and Engineering from the IIT Madras and a Ph. D. in Cyber Law from Gujarat National Law University. He also has an LLM (Pro) (with specialization in IPR) as well as three PG Diplomas from the National Law University, Delhi- one in Urban Environmental Management and Law, another in Environmental Law and Policy and a third one in Tourism and Environmental Law. He also holds a post-graduate diploma in IPR from the National Law School, Bengaluru and

a professional diploma in Public Procurement from the World Bank.

Dr. R. K. Upadhyay

Dr. R. K. Upadhyay is Registrar, University of Kota (Raj.), Dr Upadhyay obtained LLB, LLM degrees from Banaras Hindu University & PHD from university of Kota. He has successfully completed UGC sponsored M.R.P for the work in the Ares of the various prisoners reforms in the state of the Rajasthan.



Senior Editor

Dr. Neha Mishra



Dr. Neha Mishra is Associate Professor & Associate Dean (Scholarships) in Jindal Global Law School, OP Jindal Global University. She was awarded both her PhD degree and Associate Professor & Associate Dean M.A.; LL.B. (University of Delhi); LL.M.; PH.D. (NLSIU, Bangalore) LLM from National Law School of India University, Bengaluru; she did her LL.B. from Faculty of Law, Delhi University as well as M.A. and B.A. from Hindu College and DCAC from DU respectively. Neha has been a Visiting Fellow, School of Social Work, Michigan State University, 2016 and invited speaker Panelist at Global Conference, Whitney R. Harris World Law Institute, Washington University in St. Louis, 2015.

Ms. Sumiti Ahuja

Ms. Sumiti Ahuja, Assistant Professor, Faculty of Law, University of Delhi,

Ms. Sumiti Ahuja completed her LL.M. from the Indian Law Institute with specialization in Criminal Law and Corporate Law, and has over nine years of teaching experience. She has done her LL.B. from the Faculty of Law, University of Delhi. She is currently pursuing PH.D. in the area of Forensics and Law. Prior to joining the teaching profession, she has worked as Research Assistant for projects funded by different agencies of Govt. of India. She has developed various audio-video teaching modules under UGC e-PG Pathshala programme in the area of Criminology, under the aegis of an MHRD Project. Her areas of interest are Criminal Law, Law of Evidence, Interpretation of Statutes, and Clinical Legal Education.



Dr. Navtika Singh Nautiyal

Dr. Navtika Singh Nautiyal presently working as an Assistant Professor in School of law, Forensic Justice and Policy studies at National Forensic Sciences University, Gandhinagar, Gujarat. She has 9 years of Teaching and Research Experience. She has completed her Philosophy of Doctorate in 'Inter-country adoption laws from Uttarakhand University, Dehradun' and LLM from Indian Law Institute, New Delhi.

Dr. Rinu Saraswat



Associate Professor at School of Law, Apex University, Jaipur, M.A, LL.M, PH.D,

Dr. Rinu have 5 yrs of teaching experience in renowned institutions like Jagannath University and Apex University. Participated in more than 20 national and international seminars and conferences and 5 workshops and training programmes.

Dr. Nitesh Saraswat

E.MBA, LL.M, PH.D, PGDSAPM

Currently working as Assistant Professor at Law Centre II, Faculty of Law, University of Delhi. Dr. Nitesh have 14 years of Teaching, Administrative and research experience in Renowned Institutions like Amity University, Tata Institute of Social Sciences, Jai Narain Vyas University Jodhpur, Jagannath University and Nirma University. More than 25 Publications in renowned National and International Journals and has authored a Text book on CR.P.C and Juvenile Delinquency law.



Subhrajit Chanda



BBA. LL.B. (Hons.) (Amity University, Rajasthan); LL. M. (UPES, Dehradun) (Nottingham Trent University, UK); PH.D. Candidate (G.D. Goenka University)

Subhrajit did his LL.M. in Sports Law, from Nottingham Trent University of United Kingdoms, with international scholarship provided by university; he has also completed another LL.M. in Energy Law from University of Petroleum and Energy Studies, India. He did his B.B.A.LL.B. (Hons.) focussing on International Trade Law.

ABOUT US

WHITE BLACK LEGAL is an open access, peer-reviewed and refereed journal provide dedicated to express views on topical legal issues, thereby generating a cross current of ideas on emerging matters. This platform shall also ignite the initiative and desire of young law students to contribute in the field of law. The erudite response of legal luminaries shall be solicited to enable readers to explore challenges that lie before law makers, lawyers and the society at large, in the event of the ever changing social, economic and technological scenario.

With this thought, we hereby present to you

ARTIFICIAL INTELLIGENCE IN THE DOCK: EXAMINING THE ADMISSIBILITY OF AI- GENERATED FORENSIC EVIDENCE

AUTHORED BY - SONALI DEBBARMA

Research scholar, Faculty of Law, ICFAI University, Tripura

ABSTRACT

The artificial intelligence (AI) is making its way into the sphere of forensics where facial recognition, digital forensics, DNA profiling, handwriting analysis, and predictive algorithms are used. Such technologies are efficient and precise regarding solving criminal cases, but much more complicated issues of legality and morality are associated with the possibility of their introduction into courts. AI-generated evidence also has problems of transparency, reliability and accountability, unlike with traditional forensic evidence. Due process and a right to an impartial trial are threatened because of black-box nature of algorithms, data-set bias risks, and authentication difficulties.

The current article attempts to explore the admissibility of AI-generated forensic evidence in India as per the Bharatiya Sakshya Adhiniyam, 2023 and comparative analysis to the United States and the United Kingdom, where evidence standards are adapted in the Frye Test and Daubert Standard to govern admissibility of expert scientific testimony. It also brings into light urgent issues around judicial capability to analyse AI evidence, lack of transparent standards to properly use forensic AI tools, and misinterpretation of AI machine-derived conclusions.

The article maintains that although AI potentially transforms justice delivery, it can undermine the legal protections it can be deployed. It offers the creation of expert categories of admissibility, certification of AI forensic tools, the training of judges and transparency requirements to developers to avoid the likelihood that AI weakens rather than enhance justice.

Keywords

Artificial Intelligence (AI), Forensic Evidence, Admissibility of Evidence, Expert Testimony

1. INTRODUCTION

The history of the field of forensic science has always been associated with the advancement of technology. Since the start of fingerprint identification in the 19th century up to present frequency of DNA profiling in the late 20th century, each new development has transformed the process of evidence gathering, interpretation and its presentation in law courts. Artificial Intelligence (AI) is such a leap in the twenty-first century. Facial recognition, digital forensics, DNA sequencing, voice analysis, and even predictive policing are nowadays used widely as AI-based tools. The technologies ensure efficiency, accuracy and speed in criminal investigation like never before. But once introduced into the justice system, it poses really deep questions about admissibility and reliability of the evidence obtained using AI to generate the forensic evidence.

In comparison with other older types of forensic evidence, AI-based evidence is likely to be run in complicated algorithms and machine learning models, which work as black boxes. The underlying processes may not be easily comprehended by judges, lawyers, and even forensic experts and thus challenged. The issue is also further complicated by concerns of bias, data training errors and manipulation of output. In case the courts are made to admit such evidence without strong proofs, there is a chance of contravening the natural justice and the right to fair trial principles.

OBJECTIVE

- To examine the scope and challenges of using Artificial Intelligence in forensic science and its impact on the admissibility of evidence in courts.
- To analyse the existing legal framework under the Bharatiya Sakshya Adhiniyam, 2023, in light of AI-generated forensic evidence, with comparative insights from international jurisdictions.
- To propose legal, ethical, and procedural reforms for ensuring reliability, transparency, and fairness in the admission of AI-generated forensic evidence in judicial proceedings.

2. AI AND FORENSIC EVIDENCE: AN OVERVIEW

Any data, data analysis or data interpretation generated using an AI-based system in the context of criminal investigation and criminal proceedings would be referred to as artificial intelligence (AI)-generated forensic evidence. In contrast to the classic one, which is based on the human

experience only, AI powered tools use machine learning algorithms and neural network as well as data analytics to detect any trends and anomalies and deliver results, which can be brought to the court of law. This kind of evidence is unique in that it blends science and technology in automation alongside forensics sounding off a grey area in reliability, authenticity, and admissibility.

The most important types of forensic evidence created by AI are:

- **Digital Tracking:** AI technology is used to analyse bulk data online which may include social media, internet browsing history, geolocation, and metadata to identify a pattern and trends associated with criminal activities.
- **Facial Recognition:** AI Recognition systems compare facial recognition images on a surveillance camera with data bases to find suspects or prove appearance in the scene of the crime.
- **DNA Profiling:** Complex mixtures of DNA: Since its discovery a wide dynamic range has been applied to genetic analysis using advanced AI algorithms to spot signals in complex mixtures of DNA allowing physical prediction and help accelerate a process in forensics DNA sequencing.
- **Handwriting and Document Analysis:** The machine learning models study the analysis of handwriting, signatures and document authenticity faster and more accurately than the traditional manual process.
- **Predictive Tools:** AI programs are used in predicting crimes and risk analysis of offenders as well as predictive policing, which produces data that can indirectly be used as forensic evidence.

In this way, the created AI-based forensic evidence can be discussed as an integration of science, technology, and law. Being efficient and precise, it is admissible as long as it is recognized by the law, reliability of methods offered, and it complies with the principles of a fair trial.

2.1 DISTINCTION: TRADITIONAL FORENSIC VS. AI-DRIVEN FORENSIC EVIDENCE

Forensic science has historically depended on human expertise, recognized scientific methodologies, and physical evidence. However, the incorporation of Artificial Intelligence (AI) into forensic operations has resulted in automation, predictive capabilities, and data-driven

analytics. While both seek to unearth the truth and aid courts, their techniques, trustworthiness, and obstacles differ greatly¹.

- **Forensic Evidence:**

Is limited to the manual and expert-based means of gathering, examining, and translating both physical and digital evidence. Includes human analysts reviewing fingerprints, DNA, blood pattern, toxicology, traces, witness, and in some rare cases low-res video or pictures. Manual analysis is time-pending, highly subject to human error, has been known to be a product of human cognitive competence, and is usually limited by the quality of data and the amount of data to be studied². Important aspects of crime scene recomposition and evidence interpretation are rather based on the experience of the experts and subjective opinion. According to traditional techniques, the primary emphasis is put on physical evidence and primal digital data involvement³⁴.

- **AI-Driven Forensic Evidence:**

Uses AI-based artificial intelligence, machine learning, computer vision, natural language processing, and deep learning to automate and improve the process of collecting and analysing evidence, and interpreting it. AI is capable of analysing and sifting through huge amounts of digital and even physical evidence more quickly and accurately than established practice. Able to detect complex patterns, aberrations, and subtle cues in fingerprints, DNA, video/audio files) and cyber activity, and unstructured digital data volumes that would otherwise go unnoticed by humans. Expands image and video analysis to facial recognition, object recognition and video improvement⁵. Especially useful in digital forensics and investigations involving cybercrimes because it helps to trace malicious activity, anomalies in networks, and digital tracks easily⁶. Enables more detailed and accurate reconstruction of crime scenes, as the service

¹ MARY MOUNT UNIVERSITY, <https://marymount.edu/blog/the-role-of-ai-in-forensics/> (last visited on August 15, 2025)

² Dr Anju Choudhary, Rupali Mehta, *Algorithms and Evidence: The AI Revolution in Forensics*, 10 INTERNATIONAL JOURNAL OF RESEARCH AND INNOVATION IN APPLIED SCIENCE, 361-366, (2025)

³ Maruf Billah, *Developing an Explainable AI System for Digital Forensics: Enhancing Trust and Transparency in Flagging Events for Legal Evidence*, 9 JOURNAL OF FORENSIC SCIENCE AND RESEARCH, 109-116, (2025)

⁴ Manish Gupta, *Forensic Investigations in the Digital Age: Tools, Techniques, and Trends*, INNEFU, (July 9, 2025) <https://innefu.com/forensic-investigations-in-the-digital-age-tools-techniques-and-trends/>

⁵ Rohit Tahsildar Yadav, *AI-Driven Digital Forensics*, 10 INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH & Engineering Trends, 1673- 1681 (2024)

⁶ EclipseForensic, *Comparing Traditional vs. Modern Forensic Methods: A Brief Guide*, ECLIPSEFORENSICS, (October 2, 2024), <https://eclipseforensics.com/comparing-traditional-vs-modern-forensic-methods-a-brief-guide/>

handles such data types as images, text, biometrics and sensor data. AI systems provide more scalability and efficiency, but also necessitate careful consideration of ethical issues such as data privacy, algorithmic bias, transparency, and legal trustworthiness. Increasingly utilized to supplement traditional forensic competence with computational evaluations and evidence that can be scientifically examined⁷.

2.2 ROLE OF AI IN INVESTIGATION AND TRIAL PROCESSES

- Role of AI in Investigation Processes
 - I. Data Analysis and Pattern Recognition: Artificial intelligence (AI) systems possess the capability to efficiently process vast quantities of digital evidence, including surveillance videos, emails, communications, and geolocation data, to identify patterns, anomalies, and connections among suspects or criminal activities. This capability significantly exceeds the capacity of manual review, enabling investigators to comprehend highly complex or voluminous datasets⁸.
 - II. Evidence Processing and Enhancement: AI tools employ computer vision techniques to enhance and analyse low-quality surveillance footage, identify suspects or vehicles, and detect suspicious activities in real-time. Natural language processing (NLP) facilitates the rapid analysis of communications for keywords, intent, and connections, thereby enhancing the efficiency of evidence discovery and contextualization⁹¹⁰¹¹.
 - III. Crime Prediction and Prevention: Machine learning models utilize historical crime data to predict and prevent future incidents by identifying high-risk areas and behavioural patterns. This enables law enforcement agencies to deploy resources more proactively and manage emerging threats more effectively¹².
 - IV. Case Management and Prioritization: AI algorithms assist law enforcement in organizing caseloads, prioritizing investigations based on risk assessment or likelihood of resolution, and enhancing situational awareness in ongoing investigations¹³.

⁷ Lena Klas, Niclas Fock, Robert Forchheimer, *The invisible evidence: Digital forensics as key to solving crimes in the digital age*, FORENSIC SCIENCE INTERNATIONAL, 362 (2024)

⁸ Omar Alakayleh, *The Use of Artificial Intelligence Systems in Crime Detection and Prevention: Applications and Challenges*, SSRN, (January 01, 2025), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5132225

⁹ *Ibid.*

¹⁰ PIB.GOV.T, <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/feb/doc2025225508901.pdf> (last visited on August 16, 2025)

¹¹ *Ibid.*

¹² *Ibid.*

¹³ *Ibid.*

- **Role of AI in Trial Processes**

- I. Automation of Legal Tasks: AI technologies automate repetitive tasks such as legal research, document review, and case management, thereby expediting judicial workflows and reducing case backlogs¹⁴.
- II. Decision Support for Judges and Attorneys: AI algorithms evaluate evidence, assess risks, and predict potential case outcomes, thereby assisting judges, prosecutors, and defence attorneys in making informed and equitable decisions. Advanced analytics can highlight relevant case law or contradictory evidence for consideration¹⁵.
- III. Ensuring Equity and Accuracy: By supporting data-driven assessments, AI reduces the influence of individual bias or error in judicial decision-making, thereby contributing to fairer outcomes and improved equity in the administration of law¹⁶.
- IV. Risk Assessment and Rehabilitation: In correctional settings, AI tools can aid in tailoring rehabilitation programs and monitoring inmate behaviour, thereby reducing recidivism rates by effectively targeting interventions¹⁷.
- V. Trial Optimization: In the context of clinical trials, AI simulates scenarios, predicts outcomes, streamlines recruitment, and manages trial documentation, resulting in more efficient, accurate, and patient-centric research and adjudication processes^{18,19,20}.

3. LEGAL FRAMEWORK ON ADMISSIBILITY OF EVIDENCE

3.1 Indian Legal Framework: The Bharatiya Sakshya Adhiniyam, 2023

In India, the Bharatiya Sakshya Adhiniyam, 2023 (BSA, 2023) governs evidence admissibility, replacing the Indian Evidence Act, 1872. While the BSA modernizes regulations governing electronic and digital documents, it does not specifically address AI-generated forensic evidence. The relevant provisions include:

- **Section 61** (Expert Opinion) allows for expert testimony in science, handwriting, fingerprinting, and other specialized subjects. AI-generated forensic analysis could be

¹⁴ Aishwarya Sharma, Shivangi Chauhan Sharma, Srishti Dixit Soni, Pooja Agrawal, Pratihtha Mishra, Geeny Mourya, *Artificial Intelligence in the Indian Criminal Justice System: Advancements, Challenges, And Ethical Implications*, JOURNAL OF LIFESYTLE AND SDG'S REVIEW, (2025)

¹⁵ *Ibid.*

¹⁶ *Ibid.*

¹⁷ *Ibid.*

¹⁸ COHERENTSOLUTIONS, <https://www.coherentsolutions.com/insights/role-of-ml-and-ai-in-clinical-trials-design-use-cases-benefits> (last visited on August 16, 2025)

¹⁹ FAST DATA SCIENCE, <https://clinicaltrialrisk.org/clinical-trial-design/ai-in-clinical-trials-the-edge-of-tech/> (last visited on August 16, 2025)

²⁰ CLINIINDIA, <https://www.cliniindia.com/how-artificial-intelligence-is-transforming-clinical-trials/> (last visited on August 17, 2025)

introduced by expert witnesses who use such techniques.

- **Section 63** (Electronic Records) recognizes the admission of electronic records, including computer outputs, which may indirectly apply to AI-driven digital forensics.
- **Section 64** (Presumptions as to Electronic Records): Allows courts to infer the validity of electronic records that are produced in suitable form. This could be expanded to AI-generated outputs with proof of reliability.
- **Section 65** (Electronic Agreements and Signatures): Addresses the legitimacy of electronic signatures and digital validation, which is crucial when AI algorithms validate documents or handwriting.

However, the lack of express recognition for AI-based forensic methodologies causes confusion, leaving admissibility to court judgment.

3.2 International Standards of Admissibility

(a) Frye Test – United States

Frye v. United States (1923) established the Frye Test, which permits scientific evidence to be included if it has achieved "general acceptance" among the relevant scientific community. According to this criteria, AI-generated forensic evidence is admissible only if the scientific and forensic communities generally accept its dependability.

(b) Daubert Standard – United States

In Daubert v. The U.S. Supreme Court in Merrell Dow Pharmaceuticals (1993) further enlarged the notion of admissibility by making it mandatory that the evidence must be scientifically reliable, as well as material. Daubert comprises of the following factors:

- The theory/technique testability,
- Publication and peer review,
- Published error rates,
- Norms regulating the functioning of the technique, and

(c) UK Approach

In the United Kingdom, expert testimony is admissible if it would assist the court and is based on a reliable body of knowledge or experience. Recent investigation of facial recognition systems has sparked debates about proportionality, privacy, and trustworthiness. Courts typically admit AI-based evidence with caution, often needing confirmation.

(d) EU Approach

The EU has adopted the rights-based approach with the EU Artificial Intelligence Act, 2024

and GDPR with a focus on transparency, accountability and the underlying rights. Significant steps towards high-risk AI systems require a strict regulated level before deployment and this will directly affect its admissibility by EU courts.

3.3 Comparative Notes: India vs. U.S. vs. U.K./EU

- India (BSA, 2023): No specific mention of AI evidence; whether or not admissible relies on how the expert opinion and electronic records sections are interpreted.
- United States: Provides structured admissibility tests (Frye, Daubert) That guarantee reliability of the scientific products; the AI evidence is tested against well-established criteria.
- United Kingdom: The emphasis is on its support to the court and trustworthiness, and court reluctance of embracing AI-based approaches.
- European Union: AI application has been regulated along with justice considering that legal instruments should be strenuous, focusing on rights, openness and accountability.

In this way, although India is in a weak legal basis, international standards offer more transparent frameworks to analyse AI-generated forensic results. The Indian judiciary will perhaps have to pursue a mixed approach of scientific reliability with the protection of constitutional rights.

4. CHALLENGES OF AI-GENERATED FORENSIC EVIDENCE

The use of artificial intelligence into forensic science, while intriguing, raises substantial concerns about its admissibility and trustworthiness in court. These difficulties arise not only from technical restrictions, but also from ethical, procedural, and judicial problems.

4.1 The Black Box Problem (Lack of Transparency)

The majority of AI systems, and deep learning-based ones specifically work in a black box manner, meaning that the process underlying the decision is obscure and difficult to explain even by those who might have created the system. In most cases, however, the expert opinions need to be justified in courts. Without the ability to interpret the decision making process of an AI system, the evidence may not be admissible or persuasive should the judgment and the lawyers involved not be able to make a sense of how the AI system came to these conclusions.

4.2 Algorithmic Bias and Reliability Issues

The quality of AI systems is based on the quality of the data to which they are trained.

Discriminatory evidence should be seen as an issue of biased or incomplete dataset, as with facial recognition technology (misidentification), skewed risk assessment. The problem of such bias is that it discredits the effectiveness of forensic conclusion, posing a threat of erroneous convictions.

4.3 Authenticity and Chain of Custody Concerns

Forensics has to be found as genuine and not tampered with. Needs may lead to manipulation, hacking or deepfake technologies of AI-generated outputs, however. Getting a proper chain of custody on digital evidence and AI-generated evidence is thus more difficult as compared to the physical evidence.

4.4 Ethical and Privacy Implications

Ethical concerns are critical in the case of massive applications of AI to forensics. Some examples of such tools include predictive policing that can discriminately identify communities, mass surveillance and face recognition identification systems that violate privacy rights. The courts are compelled to balance between the evidentiary magnitude of AI outputs and possible steps toward the infringement of constitutional rights.

4.5 Judicial Capacity Gap (Lack of Technical Expertise)

Neither judges nor lawyers usually possess any technical knowledge in AI and machine learning, so it might be hard to determine the reliability of the evidence exerted upon. AI is not fixed in nature, unlike classic forensic domains; it is continuously changing and regularly proprietary. The judiciary can therefore fall victim to ignoring the output of AI services or over-relying on them without specific training.

5. RECOMMENDATIONS

- Build Clear Admissibility Standards.
- Mandatory Explainability, Transparency.
- Chain of custody and certification of AI Tools.
- Training of Judges and Lawyers.
- Ethical and Privacy Compliances.
- Independent Oversight and Audit.

6. CONCLUSION

Forensics evidence results produced by AI have immense potential in reinforcing the investigations and trials to increase accuracy and efficiency. Nevertheless, its admissibility has some challenges that include non-transparency of source code, algorithmic discrimination, privacy costs, and a missing certification requirement. Although driven by the Bharatiya Sakshya Adhiniyam, 2023 and international precedents, Indian courts should develop context-specific frameworks that enable the courts to be fair. Finally, AI must not replace judicial reasoning but supplement it and any topic where AI should be used must always meet constitutional protection and due process.

