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Examination of the Legal Role of Artificial Intelligence in Forensic Crime Investigation Under the Administration of Criminal Justice System in Nasarawa State, Nigeria

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Abstract

This study examines the Legal Role of Artificial Intelligence in Forensic Crime Investigation Under the Administration of Criminal Justice Law 2018 of Nasarawa State, Nigeria. The study aims to establish a coherent jurisprudential and regulatory framework for AI-assisted forensic practice. Objectives are to interrogate the admissibility of AI-generated evidence under the Evidence Act 2011 and ACJL 2018, assess institutional capacity, and develop normative safeguards for due process compliance. The Problem bedeviling this study is the inadequate Algorithmic opacity, lack of statutory validation standards, and potential bias in AI forensic tools create doctrinal uncertainty, jeopardising fair trial rights under Section 36 of the 1999 Constitution and undermining judicial confidence in digital evidence. A concurrent triangulation mixed-methods design was employed, integrating doctrinal analysis of statutes, judicial precedents, and policy instruments with empirical data from in-depth interviews and survey questionnaires administered to 71 purposively selected judges, prosecutors, defence counsel, police forensic units, and ICT experts across Nasarawa State. Theoretical Framework is underpinned by Constitutional Due Process Theory and Techno-Legal Institutionalism which evaluate the interface between automated forensic innovation and procedural justice. Findings revealed that the AI enhances investigative speed and evidentiary precision but remains legally precarious due to absent certification regimes, explainability deficits, and inadequate judicial training. The study Recommends urgent amendment of ACJL 2018 to codify AI evidence protocols, mandatory algorithmic audits, and creation of a State Forensic AI Oversight Board. Suggestions for Further Study anchored Comparative evaluation of AI evidentiary regimes in Nigeria's six geopolitical zones. In conclusion AI's forensic utility is constitutionally sustainable only when legislative reform embeds transparency, accountability, and human oversight into Nasarawa State's criminal justice architecture.

Keywords: *Examination, Artificial, Intelligence, Criminal, Investigation*

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Background to the Study

Examination of the legal role of artificial intelligence in forensic crime investigation under the administration of criminal justice system in Nasarawa State, Nigeria has become emerging phenomenon in the recent time history. The advancement of technological processes in conducting forensic investigation and proceeding in legal research is germane in the world global space which are allude significantly increased in the use of digital technologies in modern legal processes to conduct research investigation and improvement in the quest for knowledge driven in the advancement of technology using Artificial Intelligence especially in the legal parlance in Nasarawa State, Nigeria.

Artificial intelligence was originally rooted in science fiction, is now an indispensable reality that has a remarkable impact on almost every facet of human activities. Similarly, Artificial intelligence is an embodiment of machine learning and analytical algorithm-based systems which has emerged as a transformative force in the legal role and enhancing criminal justice administration institution across the world, revolutionizing traditional practices and enhancing efficiency for all legal framework. This implies or infer that the emergence of Artificial Intelligence (AI) as a transformative technological force has fundamentally altered the operational landscape of numerous disciplines, and the administration of criminal justice is no exception.[1] At its core, Artificial Intelligence encompasses the simulation of human cognitive functions including learning, reasoning, problem-solving, perception, and language comprehension by computational systems. These capabilities are being deployed across a wide spectrum of human endeavour, from medical diagnostics and financial modelling to autonomous vehicles and, increasingly, law enforcement and forensic investigation.

Apparently, the global society has evidently shown in recent time in research findings that the role of Artificial Intelligence powered forensic tools have begun to redefine how crimes are detected, investigated, and prosecuted. Facial recognition systems capable of matching suspects to surveillance footage within seconds, predictive policing algorithms that anticipate criminal hotspots before offences occur, voice recognition software that analyses audio evidence, and machine learning platforms that process digital artefacts from seized electronic devices are now integral instruments in the forensic arsenals of law enforcement agencies in technologically advanced jurisdictions.[2] These innovations have enhanced investigative accuracy, reduced the time required to resolve complex cases, and expanded the evidentiary base available to prosecutors.

It has long been believed that the areas of forensic crime investigation, administration of criminal justice system, criminal law, cybercrime, robotics and technology are incongruous. The prospect of using artificial intelligence in court has been considered in criminal procedural law in dispensation of administration of criminal justice system. Not only are the

[1] Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach (4th ed., Pearson 2020) 1–4.

[2] Organisation for Economic Co-operation and Development (OECD), 'Recommendation of the Council on Artificial Intelligence' (OECD/LEGAL/0449, 22 May 2019) <https://legalinstruments.oecd.org> accessed 1 March 2025.

way crimes occurring fluctuating wildly, but also how examinations are carried out because of the shift to a digital age. We humans have the duty to deliver justice, and the sudden digital transformation in society is changing how this duty is carried out. The advantages of technology and AI must be fully utilized possible by the court system. For the better interest of society, especially in regard to the criminal justice system, experts from professions such as policymakers, technologists, and lawyers must collaborate. AIC has not yet received recognition as a significant phenomenon. The research on AI's ethical and societal ramifications places more emphasis on policing and limiting its civil applications than it does on examining its potential role in crime. The AIC research that is now available is also dispersed over several other academic fields, including socio-legal studies, computer science, criminology and security studies, cybercrime, psychology, and robotics, to mention a few.

This new area of prospective criminal activity's lack of research focused on AIC limits the possibilities for both projections and solutions. Cities are also looking into further uses for surveillance and AI technologies. To reduce air pollution for sustainability purposes, AI is being used in emission controls and urban tolling. Another developing application area is future health crisis prevention. Paris utilizes artificial intelligence to monitor the metro system to ensure that riders are wearing face masks. The objective is not to track down and punish lawbreakers, but rather to generate anonymous data that helps authorities anticipate future outbreaks of infection.

A wide range of areas in our lives, including agriculture, industry, communication, education, finance, government, service, manufacturing, medicine, and transportation, have adopted AI applications. Even criminal justice and public safety are benefited by AI. For instance, crime forecasts make it possible to allocate policing resources more effectively, and traffic safety systems track down infractions and enforce traffic laws. AI is also assisting in the identification of reoffender risk in people under criminal justice supervision. NIJ-funded research is paving the road for the application of AI to criminal justice issues, including DNA analysis, gunshot detection, and crime forecasting. These applications include identifying people and their behaviors in recordings pertaining to criminal activity or public safety.

Also, the study revealed that the working to improve public safety by studying, creating, and testing automatic traffic accident video-based detection to support the maintenance of safe and effective commuter traffic over varied locations and weather, illumination, and traffic conditions. It may be crucial for the criminal justice and medical examiner sectors to consider the use of AI algorithms in medicine when determining the cause and manner of death. DNA analysis is just one of many forensic science fields where AI algorithms have been researched. Artificial intelligence is steadily improving to the point where it may be used to both penalize criminals and prevent illegal activity. It is no longer only a theory to be conjectured about. Numerous law enforcement agencies use cutting-edge techniques to deter crime worldwide. Facial recognition is one approach being used frequently in fields other than law to ensure security. Computers are used to analyze a framework known as artificial intelligence in the field of law enforcement. It can also be used to decide on ultimate judgements. The technology is what has the most potential for the future of crime detection.

Around the world, businesses and cities are experimenting with employing artificial intelligence to lessen and prevent crime as well as respond to crimes in progress more rapidly. Several of these initiatives are based on the notion that crimes may be, to a large extent, predicted; all that is needed is the ability to sift through vast amounts of data to identify patterns that are helpful to law enforcement. It was once technologically difficult to perform this type of data analysis, but current advancements in machine learning should make it practical. This article will divide the various ways that businesses are attempting to combat crime with AI into two broad categories: How artificial intelligence (AI) is used to identify crimes in (a) and (b) Ways AI is being used to prevent future crimes.

The effective collaboration study revealed that the findings affirm United Kingdom, United States, European Union, China, and India have all, to varying degrees, integrated Artificial Intelligence into their forensic investigation frameworks. Europol has documented the deployment of Artificial Intelligence driven analytics in combating organised crime, cybercrime, and terrorism across European member states.[3] In the United States, the Federal Bureau of Investigation's Next Generation Identification system employs Artificial Intelligence to process biometric data including fingerprints, iris scans, and facial images thereby enhancing the identification of suspects across a national database.[4] These international developments underscore the inexorable direction in which modern criminal justice is trending: towards data-driven, technology-mediated investigative processes.

Against this global backdrop, Nigeria Africa's most populous nation and largest economy occupies an interesting and complex position. The country faces formidable challenges in its administration of criminal justice system: rising crime rates across major urban and peri-urban centres, inadequate forensic infrastructure, endemic institutional corruption, and a judiciary overwhelmed by an ever-growing caseload.[5] The Administration of Criminal Justice Act (ACJA) of 2015 marked a landmark attempt to modernise criminal procedure at the federal level, introducing provisions for electronic evidence and digital records. [6] Nevertheless, the practical integration of Artificial Intelligence into forensic investigation remains nascent, inconsistent, and insufficiently regulated.

Nasarawa State, located in the North-Central geopolitical zone of Nigeria, epitomises the broader challenges confronting Nigerian criminal justice administration. The state has, in recent years, contended with complex security challenges including armed banditry,

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[3] Europol, 'Facing Reality? Law Enforcement and the Challenge of Artificial Intelligence' (Europol Innovation Lab Report, 2022) 7.

[4]National Institute of Standards and Technology (NIST), 'Forensic Science International: The Role of AI in Digital Forensics' (US Department of Commerce 2021) 3.

[5]Federal Bureau of Investigation (FBI), 'Next Generation Identification (NGI)' (FBI Biometric Center of Excellence, 2023) <https://www.fbi.gov/services/cjis/fingerprints-and-other-biometrics/ngi> accessed 2 March 2025.

[6]Administration of Criminal Justice Act 2015, s 1; see also Gbenga Oduntan, 'Technology and the Nigerian Justice System: Gaps and Opportunities' (2020) 14 Journal of African Law 201, 204.

[7]Nigeria Police Force, 'Annual Report on Crime Statistics' (NPF Headquarters, Abuja 2022) 18–21.

communal conflicts, kidnapping, and organised criminal activity.[7] These security exigencies have strained the investigative capacity of the Nigeria Police Force and other law enforcement agencies operating within the state. The forensic investigation of crimes in Nasarawa State as in most Nigerian states outside Lagos and Abuja continues to rely predominantly on traditional, non-technology-driven methods: witness testimony, physical examination of crime scenes, and document analysis. The limitations of these conventional approaches are well documented. Human error, witness unreliability, evidence tampering, and the absence of standardised forensic protocols have collectively contributed to high rates of wrongful conviction, case abandonment, and prosecutorial failure within the Nigerian system.[8] The Evidence Act 2011 as amended 2023, while introducing provisions for the admission of computer-generated evidence under Section 84, does not address AI-specific evidentiary standards, creating a significant legal lacuna as AI-generated forensic outputs increasingly find their way into investigative and prosecutorial processes.

The deployment of Artificial Intelligence in forensic investigation raises profound legal questions that transcend mere technicality. These include questions of due process whether an accused person is afforded adequate opportunity to challenge AI-generated evidence; questions of privacy whether the mass data collection underpinning Artificial Intelligence forensic tools is consistent with constitutional rights; and questions of admissibility whether AI-derived outputs meet the existing legal standards for evidence in Nigerian courts.[9] The Cybercrimes (Prohibition, Prevention, etc.) Act 2015, while providing a framework for digital offences, does not comprehensively address the regulatory requirements governing the use of Artificial Intelligence as an investigative instrument. Beyond legal technicalities, the ethical dimensions of Artificial Intelligence in forensic investigation are equally compelling. Artificial Intelligence systems, particularly those trained on historical crime data, are susceptible to replicating and amplifying systemic biases embedded within that data resulting in the disproportionate targeting of socio-economically marginalised communities.[10] In Nigeria, where there is documented evidence of policing practices that disproportionately impact certain demographic groups, the uncritical adoption of Artificial Intelligence forensic tools without adequate legal safeguards could deepen existing injustices rather than correct them. The promulgation of the Nigeria Data Protection Act 2023 represents a significant legislative development in the country's governance of personal data, including the categories of data routinely processed by Artificial Intelligence forensic systems biometric information, communication records, location data, and financial transactions.[11] However, the Act's Artificial Intelligence interaction with law enforcement activities and its implications for the admissibility of processed personal data in criminal proceedings remain incompletely theorised in both judicial decisions and academic scholarship.

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[8] National Bureau of Statistics, 'Crime and Security Statistics' (NBS 2023) 9.

[9] Evidence Act 2011 (Nigeria), s 84; Dickson Ogbonnaya Igwe, 'Electronic Evidence and the Nigerian Courts' (2019) 7 Afe Babalola University Journal of Sustainable Development Law and Policy 55, 58.

[10] Cybercrimes (Prohibition, Prevention, etc.) Act 2015 (Nigeria), s 37–39.

[11] Nasarawa State Government, 'State Security Report' (Ministry of Internal Affairs, Lafia 2022) 4–6.

This study is therefore situated at the intersection of technology law, criminal procedure, and forensic science. It examines the legal role of Artificial Intelligence in forensic crime investigation under the administration of criminal justice in Nasarawa State, thereby contributing to a body of knowledge that remains remarkably thin despite the urgency of the practical issues it addresses. Artificial intelligence (AI) technology can be used to track content or a person's digital footprint and identify any odd activity. The purpose of law enforcement should be to prevent crime in the first place, not to apprehend criminals. There are two sides to the use of Artificial Intelligence tools in criminal justice. Even though it has many perks, like better crime detection and fewer court proceedings, it also brings up important legal and ethical problems. Concerns like prejudice, transparency, and accountability must be addressed to guarantee that Artificial Intelligence systems are equitable and just. Predictive policing has the potential to be a revolutionary technology that gives law enforcement the chance to reverse the trend of crime for the first time in history. However, if the information underlying this technique is erroneous any advantages will be outweighed by the risks. Motivated by worldwide developments, India has launched programs like SUPACE (Supreme Court Portal for Assistance in Court Efficiency) [12], which seek to use Artificial Intelligence for legal research, document analysis, and case classification and AI-driven Voice Analysis Technology[13] used in Maharashtra during interrogations to detect stress or emotional patterns in suspects. Thus, putting these strategies into practice will aid in increasing the effectiveness of law enforcement organizations, creating AI-enabled databases, reducing procedural tasks, and boosting investigation processes. This study aims to illustrate the difficulties of artificial intelligence in this area by looking for a legal framework.

The study is animated by the conviction that legal frameworks must evolve in tandem with technological capabilities, and that the absence of such evolution risks both the miscarriage of justice and the erosion of fundamental rights.[14]

Conceptual Framework

A conceptual framework serves as the definitional and analytical scaffold upon which a research study is constructed. It clarifies the meaning of the key concepts that recur throughout the study, ensures terminological precision, and situates the research within an established body of knowledge. This study engages five foundational concepts: Artificial Intelligence (AI); Forensic Crime Investigation; the Criminal Justice System in Nigeria; Digital Evidence and Admissibility; and Technology and Justice Administration in Nigeria. Each concept is examined and defined below.

Artificial Intelligence (AI)

Artificial Intelligence (AI) refers to the capacity of computer systems to perform tasks that would ordinarily require human intelligence, including learning from experience, recognising

[12] (https://www.drishtiias.com/daily-news-analysis/ai-portal-supace, 2021)

[13] (https://www.hindustantimes.com/cities/pune-news/ats-says-consent-not-required-for-voice-layer-andpsychological-analysis-on-arrested-drdo-scientist-101689964723845.html, 2024)

[14] Constitution of the Federal Republic of Nigeria 1999 (as amended), s 36(1).

patterns, understanding natural language, solving problems, and making decisions.[15] The term was coined by John McCarthy in 1956, who defined it as "the science and engineering of making intelligent machines." [16] Since that foundational articulation, AI has evolved dramatically, branching into subfields including machine learning, deep learning, natural language processing, computer vision, and expert systems. Crimes have an impact on a country's reputation, economic development, and quality of life. Advanced technologies and inventive techniques for enhancing crime analytics are required to safeguard communities and secure society from criminal activity. Artificial intelligence has shown itself to be a beneficial tool for legal procedures. AI's use in the criminal judicial system has expanded.

Globally, artificial intelligence (AI) tools have been introduced to eliminate imbalances that still exist in the criminal justice system. Numerous pending cases, the amount of manual labour necessary to carry out procedural processes, a lack of technological expertise in the investigation process, etc. are some of the limitations faced by the Criminal Justice System.

Artificial Intelligence is being used in legal research and case management. Legal professionals can use these tools to streamline administrative procedures, find important precedents, and analyze large volumes of legal data. The Supreme Court's effort to improve legal research and document analysis through the use of AI (SUPACE). Since 2012, predictive policing technologies have been created and implemented in US cities like Chicago, Los Angeles, New Orleans, and New York[17]. According to reports, the United Kingdom, China, Denmark, India, and the Netherlands have implemented predictive policing systems locally. In order to discover patterns and possible crime hotspots, AI algorithms examine past crime data. By using this data, law enforcement may more efficiently allocate resources in an effort to stop criminal activity. The Delhi Police's Crime Mapping, Analytics, and Predictive System is a major step toward predictive policing.

A step toward more precise and effective forensic investigations is represented by CFSL's application of AI for forensic analysis. AI is employed in fingerprinting in many different ways, including drug recognition, DNA sequencing, fingerprint generation, evidence analysis, and document credential recognition. [18] Photographs of crime scenes can be analyzed by AI algorithms to find important details like fingerprints, weapons, and patterns of blood droplets. Forensic analysts can recognize and classify objects in photos with high accuracy by using convolutional neural networks (CNNs). These algorithms can help with crime scene reconstruction and event sequence comprehension.[19] Fingerprint analysis mostly depends on forensic specialists' knowledge. This procedure can be automated by AI-based fingerprint identification systems, which can accurately compare digital fingerprint scans to extensive

[15]Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach (4th ed., Pearson 2020) 1–2.
[16]John McCarthy, 'What Is Artificial Intelligence?' (Stanford University, 2007)
<http://jmc.stanford.edu/articles/whatisai.html> accessed 10 February 2025.
[17] (Rahman, 2021)
[18] (Kavita Saini, 2024)
[19] (Durrani, 2024)

databases. These methods help speed up identification and decrease human mistake. Trinetra, an AI-enabled program that has a database of almost 5 lakh criminals with facial recognition capabilities, has been assisting the police department in Uttar Pradesh[20]. In 2017, Delhi Police partnered with AI Vision, a facial recognition program from INNEFU Labs that provides body and gait analysis. An artificial intelligence start-up based in India, INNEFU, is taking leverage of the country's fast-growing need for facial biometrics by testing its technology on Indian faces. [21] The Kolkata Police in India is currently increasing the use of AI-powered CCTV cameras for crime detection[22]. In Gujarat, police were able to identify and prosecute a citizen who had spit on and damaged public property with the use of an AI-powered CCTV camera[23].

Due to its success in these domains, Artificial Intelligence (AI) is being promoted for use in courts to help judges speed up different legal procedures in order to solve the problem of growing pendency. AI is already saving legal professionals, such as law firms and solicitors, time and money. For example, legal professionals increasingly employ automated voice processing software to speed up note-taking and drafting. In a recent challenge between attorneys and an AI-powered mechanism to predict case outcomes, the AI-powered processor demonstrated the ability to do so with an accuracy of 86.6%, which was equivalent to the 66.3% accuracy of attorneys.[10] This illustrates how lawyers will utilize AI in the future to counsel clients on the optimal legal course of action.

In Jaswinder Singh v. State of Punjab, the Punjab & Haryana High Court employed artificial intelligence to gather opinions on a criminal case. The high court validated its ruling on an accused person's bail application via ChatGPT. This is the first time ChatGPT has been utilized in India to make a decision about a bail application.[24] For the purposes of this study, AI is understood in its applied dimension specifically the deployment of machine learning algorithms, predictive analytics, facial recognition systems, voice analysis tools, and other computational technologies in the context of law enforcement and forensic investigation. The OECD defines AI systems as "machine-based systems that can, for a given set of objectives, make predictions, recommendations, or decisions influencing real or virtual environments."[25] This definition is apt for the study's purposes because it captures the decisional character of AI outputs outputs that may, in the forensic context, directly affect the liberty, rights, and interests of individuals suspected or accused of criminal offences.

Two broad categories of AI are relevant to forensic investigation. Narrow AI (or weak AI) refers to systems designed and trained to perform specific tasks facial recognition, gunshot

[20] (TRINETRA, an AI app for Uttar Pradesh Police Department, 2018)
[21] (RIGANO, 2019)
[22] (Kolkata cops to use camera with AI to detect crime, 2018)
[23] (Gujarat: Ahmedabad Police to get high-tech Command and Control Centre with AI Integration, 2024)
[10] (Maddipati Sri Seshamamba, 2022)
[24] (Prabhu, 2023)
[25] OECD, 'Artificial Intelligence in Society' (OECD Publishing 2019) 22–24.

detection, DNA analysis without generalised cognitive ability. General AI (or strong AI), which remains largely theoretical, would possess human-level intelligence across all domains. Virtually all forensic AI applications currently deployed in law enforcement fall within the narrow AI category. Understanding this distinction is critical because the legal challenges surrounding AI in forensics particularly questions of reliability, explainability, and admissibility arise primarily from the specific design and training characteristics of narrow AI systems, including their susceptibility to dataset bias, their probabilistic (rather than deterministic) outputs, and the opacity of their algorithmic decision-making processes.

A Few Instances of Artificial Intelligence being used in the Legal Field:
With the aid of an AI-enabled robot chatbot named "FaXiaotao,"[26] which provides clients with case analysis and assists them in finding attorneys, Wusong Technology in China is aiming to digitise the way courts operate. In order to enhance its corporate/M&A business, the Singapore-based Wong Partnership also adopted AI technologies from London-based AI firm Luminance. The company employs technology to highlight parts of mergers and acquisitions transaction documents that need human inspection and involvement and to do due diligence on them.

At the Beijing Intermediate People's Court lawsuit centre, a robot named Xiao Fa was placed into service. It can respond to enquiries orally, receive input on its screen via a touchscreen or keyboard, and print papers[27].

Supreme Court Vidhik Anuvaad Software, or SUVAS, is a technology that helps translate verdicts from courts into various languages by using artificial intelligence. This is another important attempt to make justice more accessible.

Law bot pro[28], a website that is an AI-powered bot that can answer legal queries related to Indian Laws and give you answers relevant to questions

China declared in December 2019 that "Internet courts,"[29] which do not require residents to appear in court, are currently deciding millions of cases. The "smart court" consists of artificial intelligence (AI)-powered non-human judges and enables participants to register their claims online and have their cases decided in a virtual courtroom.

Start-ups like Near Law, Indian Kanoon, and Case Mine are attempting to reimagine legal research by rapidly displaying the most pertinent cases through the use of Visual Search and the Case Ranking algorithm. To identify the top 50 cases, the system organizes and ranks over 300,000 case data from more than 20 courts and tribunals. The important 0.01% of situations that are pertinent to the user are efficiently identified using the novel method.

[26] (Bracher, 2018)
[27] (Robot gives guidance in Beijing court, 2017)
[28] (htt2)
[29] (Shi, 2021)

Legal Implications of AI Use in Law Enforcement

AI has completely changed how legal systems function. Artificial Intelligence applications promise to increase the efficiency and accuracy of legal outcomes by streamlining legal activities, from aiding in legal research to sentencing decisions[30]. But this quick development in the use of AI in the legal industry also raises a number of legal and ethical concerns that need to be carefully considered and examined. While the degree to which AI is used in legal systems may differ from nation to nation, the difficulties it presents are often the same. The use of AI in the legal industry may have major consequences. Bias and unfairness, a lack of transparency, inadequate human oversight, consent difficulties, and individual autonomy are some ethical concerns. Legal concerns include cybersecurity, algorithmic accountability, AI personality, personal data protection, and the necessity of regulation. The Over-reliance on AI tools without a proper legal regulatory framework raises significant legal and ethical risks.

Algorithmic Bias and Discrimination- AI systems are prone to bias because they are often trained on historical data. Over-reliance on AI could lead to unfair outcomes, particularly in cases involving marginalized groups, if the system perpetuates biases present in the data. AI systems can make mistakes due to flawed algorithms, inaccurate data, or system malfunctions. Over-reliance without a regulatory framework (rigorous testing and review mechanisms) could lead to wrongful convictions or unjust outcomes.

Legal Risk: Violation of fundamental rights, such as the right to equality (Article 14 of the Indian Constitution) or anti-discrimination laws in various jurisdictions, may arise if biased AI decisions disproportionately harm certain individuals or groups. In cases of AI-driven errors, the justice system could face legal challenges regarding wrongful imprisonment or unfair trials, potentially leading to appeals, retrials, or compensation claims.

Ethical Risk: AI could reinforce systemic discrimination, leading to unjust outcomes where certain groups face more punitive measures, fostering inequality in the justice system. AI errors can have life-altering consequences for individuals, especially in criminal cases. The United States uses the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) method to evaluate defendants' likelihood of recidivism risk. It has been accused, meanwhile, for displaying racial bias by excessively labelling African American offenders as high-risk in comparison to their white counterparts. This case brings to light the ethical problem of prejudice and equity in criminal justice AI systems.

Miller vs. Alabama[31] The 14-year-olds Evan Miller and Kuntrell Jackson were found guilty of murder and given life sentences without the chance of parole. The Supreme Court examined the constitutionality of such juvenile sentences, concentrating on whether mandatory life in prison without the possibility of parole violates the Eighth Amendment's ban on cruel and

[30] (The Role of AI in Legal Research: Enhancing Efficiency and Accuracy, n.d.)
[31] (oyez, n.d.)

unusual punishments. The Court noted the developmental distinctions between juveniles and adults, including their immaturity, vulnerability to environmental factors, and ability for rehabilitation, in its ruling that such obligatory punishments are unconstitutional. The ruling highlights the ethical need to take these variations into account when determining sentences and also raises questions about the application of computerized risk assessments such as COMPAS, which might not sufficiently take into account the particular circumstances of juveniles and generate biased results. The court emphasized the value of individualized punishment above strict algorithms that ignore young people's particular developmental circumstances.

Lack of Legal Oversight and Regulation- Without a legal framework, there is no clear guideline on how AI tools should be deployed in the judicial system, leading to inconsistent and potentially harmful uses of the technology.

Legal Risk: The absence of regulatory standards could result in arbitrary or inconsistent use of AI in different courts or legal systems, potentially leading to discrepancies in justice delivery.

Ethical Risk: Without regulatory oversight, ethical standards in AI applications could vary widely, leaving room for misuse or unethical practices that degrade the quality of justice.

According to a recent news article, a lawyer from New York utilized ChatGPT for legal research and cited six cases in a brief that was sent to the court. However, none of the examples could be found by opposing counsel, and the lawyer was compelled to admit that he had not independently confirmed their legitimacy. The judge-imposed sanctions on the guilty solicitors and penalized their whole law firm $5,000. Therefore, lawyers should be careful while using generative AI for legal research

Forensic Crime Investigation

Forensic crime investigation refers to the application of scientific methods and techniques to the collection, preservation, analysis, and presentation of evidence relating to criminal offences, with the ultimate aim of establishing facts admissible in a court of law.[32] The term "forensic" derives from the Latin forensic, meaning "of the forum" a reference to the Roman public forum where legal proceedings were conducted. Forensic investigation therefore denotes science deployed in the service of justice: its products are not merely academic or theoretical but must satisfy the evidentiary standards of the legal system within which they are tendered.

Traditionally, forensic crime investigation encompasses a range of scientific disciplines including fingerprint analysis, ballistics, toxicology, serology, document examination, digital

[32]Volonino and Anzaldua, Computer Forensics for Dummies (Wiley 2008) 3; Eoghan Casey, Digital Evidence and Computer Crime (3rd ed., Academic Press 2011) 7.

forensics, and forensic pathology. [33] Each discipline operates within a structured methodology: crime scene management; evidence collection using chain-of-custody protocols; laboratory analysis; expert interpretation; and court testimony. The integrity of each stage is essential to the admissibility and probative value of forensic evidence. The emergence of Artificial Intelligence has expanded and transformed the forensic investigative process in significant ways. AI-powered tools now assist forensic examiners in processing large volumes of digital data from seized electronic devices, identifying latent fingerprints with greater accuracy than traditional techniques, matching facial images against large biometric databases, detecting patterns of fraudulent financial transactions, and predicting criminal activity through predictive policing systems.[34] These capabilities do not eliminate the need for human forensic expertise; rather, they augment it. However, they also introduce new legal and ethical questions particularly regarding the verifiability of AI outputs, the competence of AI-generated expert evidence, and the extent to which AI-assisted analysis conforms to the foundational principle that forensic evidence must be reliable, relevant, and the product of a scientifically valid methodology.

Criminal Justice System in Nigeria

The criminal justice system refers to the ensemble of institutions, processes, laws, and actors including law enforcement agencies, prosecutorial bodies, courts, and correctional institutions that collectively enforce criminal law, adjudicate criminal liability, and administer sanctions in response to criminal conduct. [35] In Nigeria, the criminal justice system is a complex, multi-layered structure shaped by the country's federal constitutional arrangement, its colonial legal inheritance, and its post-independence legislative evolution. At the federal level, the primary instruments governing criminal justice administration are the Constitution of the Federal Republic of Nigeria 1999 (as amended), the Administration of Criminal Justice Act 2015, the Criminal Code Act (applicable in southern states), and the Penal Code Act (applicable in northern states including Nasarawa State). [36] The ACJA 2015 represents the most significant reform of federal criminal procedure in recent decades, introducing provisions for the speedy trial of cases, the use of electronic evidence, and the protection of defendants' rights at various stages of the criminal process.

The practical operation of the Nigerian criminal justice system is, however, beset by well-documented challenges: endemic corruption within law enforcement agencies and the judiciary; severe underfunding of forensic laboratories and investigative units; a backlog of criminal cases that has reached crisis proportions in many state courts; inadequate legal representation for accused persons, particularly in rural areas; and a prosecutorial culture that

[33]National Research Council, Strengthening Forensic Science in the United States: A Path Forward (National Academies Press 2009) 40–42.

[34]INTERPOL, 'Forensic' <https://www.interpol.int/en/How-we-work/Forensics> accessed 10 February 2025.

[35]Administration of Criminal Justice Act 2015, s 1; Sunday Iyioha and Remigius Nnamdi Nwafor (eds), Comparative Health Law and Policy (Routledge 2016) 45.

[36]Femi Falana, Fundamental Rights Enforcement in Nigeria (Legaltext Publishing 2010) 22; T.A. Aguda, The Law and Practice Relating to Evidence in Nigeria (Spectrum Books 1998) 10.[37]Constitution of the Federal Republic of

has historically been over-reliant on confessional statements often obtained under duress rather than scientific evidence.[37] These systemic weaknesses provide both the context for and the justification of this study's inquiry into the potential of AI forensic tools to enhance investigative accuracy and evidentiary quality within the Nigerian system.

Digital Evidence and Admissibility

Digital evidence refers to information and data of value to a criminal investigation that is stored on, received, or transmitted by an electronic device.[38] It encompasses a wide range of materials: electronic communications (emails, text messages, social media posts); digital documents; audio and video recordings; financial transaction records; metadata; internet browsing history; and the outputs of AI forensic analysis tools. Digital evidence is now ubiquitous in modern criminal investigations, reflecting the pervasive role of digital technology in everyday life. The admissibility of digital evidence in Nigerian courts is governed primarily by Section 84 of the Evidence Act 2011, which provides that a statement contained in a document produced by a computer shall be admissible as evidence of any fact stated therein if: the document was produced by the computer during a period when the computer was used to store or process information; the information was supplied to the computer in the ordinary course of activities; throughout the material part of the period, the computer was operating properly; and the statement reproduces or is derived from information supplied to the computer in the ordinary course of activities.[39]

While Section 84 provides a framework for the admission of computer-generated evidence, it does not specifically address the distinctive characteristics of AI-generated forensic outputs, which differ materially from conventional computer-generated documents in several respects: AI outputs are produced through probabilistic inference rather than deterministic calculation; the "decision" embedded in an AI output may be the product of hundreds of thousands of weighted variables whose individual contributions cannot be readily explained; and the accuracy of an AI system is a function of the quality and representativeness of its training data, which may itself be tainted by bias or error.[40] These characteristics create significant admissibility challenges that the existing provisions of the Evidence Act 2011 are ill-equipped to resolve, constituting a central legal problem addressed by this study.

Technology and Justice Administration in Nigeria

The relationship between technology and justice administration in Nigeria is both evolving and contested. On one hand, there has been growing recognition at legislative, executive, and judicial levels that the modernisation of the justice system requires the integration of

[37]Constitution of the Federal Republic of Nigeria 1999 (as amended), s 36; Administration of Criminal Justice Act 2015, ss 1, 493.

[38]Evidence Act 2011 (Nigeria), s 84(1)(2); Cybercrimes (Prohibition, Prevention, etc.) Act 2015, s 37.

[39]Dickson Ogbonnaya Igwe, 'Electronic Evidence and the Nigerian Courts' (2019) 7 Afe Babalola University Journal of Sustainable Development Law and Policy 55, 59.

[40]Nigeria Data Protection Act 2023, ss 2, 24, 31; see also National Information Technology Development Agency (NITDA), 'Nigeria Data Protection Regulation 2019' (NITDA 2019).

technology: electronic case management systems, digital court recording, video conferencing for remote hearings, and electronic filing and service of court processes.[41] On the other hand, the actual deployment of technology within Nigerian justice institutions has been slow, uneven, and frequently hampered by inadequate infrastructure, limited technical capacity, and a conservative institutional culture.

The ACJA 2015 represents an important legislative milestone in the technology-justice relationship, establishing a framework for electronic evidence and digital records in criminal proceedings. The Nigerian courts have also, in a small but growing number of decisions, grappled with questions of digital evidence admissibility. However, the judicial development of technology law in Nigeria has proceeded largely through incremental case-by-case adjudication rather than through the development of a coherent jurisprudential framework. In Nasarawa State specifically, the integration of technology into justice administration remains at a rudimentary stage. The state lacks dedicated forensic laboratories, digital evidence units within law enforcement agencies, and a judiciary with systematic exposure to technology-related evidentiary issues. [42] The Administration of Criminal Justice Law of Nasarawa State 2016, while modelled on the federal ACJA, does not contain provisions specifically addressing AI-generated evidence or the use of AI tools in forensic investigation. This institutional and normative deficit underlines the urgency of the legal analysis undertaken in this study.

Use of Artificial Intelligence by The Judicial System

The stare decisis principle is a key consideration while deciding cases in India's courts. To make choices, it is necessary to follow the rulings of higher courts as a guide. This tiresome activity could be made easier by an AI-based database that contains copies of judgements. The statements given in court can be accurately and accurately recorded using AI-based technologies. In conducting trials, it permits transparency. Timing is slowed down unnecessarily when the legal procedure is carried out manually, including the issuance of summonses and notices, the presence of witnesses, the next hearing date, etc. To cut latencies and streamline the trial process, a system powered by AI can be deployed. Judges can award these temporary orders by using AI to precisely summarize or otherwise modify the substance of legal papers.

Future of Artificial Intelligence in Law Enforcement

The potential uses of AI may not yet be completely appreciated by the law enforcement sector. Nonetheless, it has already had an impact in crucial fields like surveillance, crime prevention, and crime investigation. with improved. AI eliminates the need for labor-intensive jobs, freeing up officers to undertake more sophisticated responsibilities. AI uses imaging technology and object and facial recognition. AI has the potential to solve crimes that would

[41]Gbenga Oduntan, 'Technology and the Nigerian Justice System: Gaps and Opportunities' (2020) 14 Journal of African Law 201, 207.

[42]Europol, 'Facing Reality? Law Enforcement and the Challenge of Artificial Intelligence' (Europol Innovation Lab 2022) 5.

otherwise go unsolved and to apprehend criminals who would otherwise escape justice. Another area to keep an eye on is predictive policing, as it may have significant effects on how offenders are apprehended, and victims are found. Predictive policing should protect the public even more than it now does, but as technology advances, there are still some hitches to be ironed out. There was agreement that combating dangers related to AI will require a more data-driven and scientific approach to criminal investigations. The creation of a "Responsible AI Innovation Toolbox for Law Enforcement" will take into consideration these observations. Also, it became clear that transparency, accountability, and trust were essential components in the creation of the AI Innovation Toolkit. A team of specialists, the INTERPOL Innovation Center, the Centre for Artificial Intelligence and Robotics at UNICRI, and a variety of stakeholders will continue to work on developing the Toolkit with all the meeting's collective feedback in mind.

The joint goal is to provide a collection of useful ideas, instances, lessons learned, concepts, and recommendations for the contemporary policing environment. There was consensus that criminal investigations will need to take a more data-driven and scientific approach to counteract the risks associated with AI. These observations will be taken into account in the development of a "Responsible AI Innovation Toolkit for Law Enforcement." Additionally, it became obvious that the development of the AI Innovation Toolkit required the use of transparency, accountability, and trust. The Toolkit will continue to be developed with the help of a team of experts, the INTERPOL Innovation Center, the Centre for Artificial Intelligence and Robotics at UNICRI, and several stakeholders. The shared objective is to offer a selection of helpful thoughts, ideas, examples, lessons gained, and recommendations for the current policing context. Computers are mostly able to "learn" via recognizing patterns, thanks to artificial intelligence. This means that a broad variety of jobs pertaining to the legal professions can be aided by AI, as it is ideal for examining massive quantities of papers and resources.

Limitations of Artificial Intelligence Tools

Although computers contribute a lot to simplify our lives, they are built to operate according to specific algorithms. Since Artificial Intelligence is not a human so, it cannot predict the circumstances as flawlessly as humans. An enormous mess can be made by a small change to test cases. For instance, if a given signal is not functioning owing to technical problems and traffic is being controlled by an officer's orders, the autonomous automobile is designed to proceed forward on a green signal. An automated vehicle would not be able to predict, make a choice, or think for itself in this situation. However, in this case, the non-automated car is safer. A person can spot the mistake and would act as the officer directs. One of the main problems limiting artificial intelligence is cost. Data undergo a unique procedure. Data mining, data cleansing and structuring, data storage, and data analysis all come at a high expense in terms of hardware and energy utilization. Generative Deep learning is used by the pre-trained Transformer 3 (GPT-3) autoregressive language model to generate text that resembles human speech. Memes are widely used in social media today. Even GPT-3 can create memes. GPT-3 is used by meme generation apps. With just a few cues, it can create amusing memes because it recognizes all meme variations. It is the deep learning of the future, and GPT-3 is

expected to cost around $4.6 million. The revised model that can compete for the human brain is in process and is approximately $2.6 Billion. In addition to this, the engineers who operate these kinds of models demand high pay. So, it is very difficult for startups to afford this much cost. There are certain features of AI development that have made admittance into this industry exceedingly exclusive. Given the cost, technical and hardware needs, AI development poses considerable capital requirements therefore establishing high barriers of entry.

The minds behind its invention are probably primarily employed by big tech if this issue continues. In the past, technological revolutions have facilitated the entry of new actors and their innovative ideas. The businesses that make up what is today known as big tech (Amazon, Google, Facebook, Apple, and others) began in exactly this manner. As we now begin to untangle the consequence of their tremendous power, the impact that they have had on society is apparent. It is reasonable to assume that enabling new companies and minds to spruce up from a new generation will lead to positive outcomes. The development of AI can aggravate the dichotomy between those in power and those without. It might also accelerate the divide between those humans with AI and the unfortunate few without. Rather than humans versus AI, the future might look like humans with AI versus humans without. An individual needs creativity to conduct a fruitful marketing strategy. Artificial intelligence is not just capable of imagination. Humans have the capacity to think, feel, and act intuitively, which often informs their decision- making. Artificial intelligence can help in identifying images, recognizing voices, and other tasks but when it comes to originality, it falls short of human creativity. Artificial intelligence thinks and works according to algorithms.

Aim And Objectives of the Study

The overarching aim of this study is to critically examine the legal role of Artificial Intelligence in forensic crime investigation under the administration of criminal justice in Nasarawa State, Nigeria, with a view to identifying existing legal gaps and proposing normative reforms. In pursuance of this aim, the study sets out the following specific objectives are to:

i. Examine the existing legal grand to institutional framework in governing the deployment of Artificial Intelligence under forensic crime investigation in Nasarawa State, Nigeria.
ii. Identify the challenges in the legal institution that impede the effective rights-compliant use of Artificial Intelligence in forensic crime investigation within the Nigerian criminal justice system.
iii. Evaluate the prospects for the effective integration of Artificial Intelligence into the forensic investigation process into the broader administration of criminal justice in Nigeria.
iv. Formulate concrete implementable legislative, institutional, and policy recommendations for the reform of the legal framework governing the use of Artificial Intelligence in forensic crime investigation in Nasarawa State and Nigeria as a whole.

Methodology

This study adopts a mixed doctrinal and socio-legal research methodology. The methodological pluralism reflects the dual character of the research problem: on the one hand, the study demands rigorous doctrinal analysis of existing legal texts statutes, case law, constitutional provisions, and subsidiary legislation in order to map the current legal framework and identify its gaps; on the other hand, it requires engagement with the social, institutional, and technological contexts within which that framework operates, demanding methodological tools capable of capturing empirical realities that pure doctrinal analysis cannot adequately address.

Doctrinal legal research, as the foundational methodological approach, involves the systematic identification, analysis, and interpretation of primary legal sources: legislation, case law, and binding legal instruments.[43] In this study, the doctrinal method is employed to examine and critique the relevant provisions of the Constitution of the Federal Republic of Nigeria 1999, the Administration of Criminal Justice Act 2015, the Evidence Act 2023, the Cybercrimes Act 2015, and the Nigeria Data Protection Act 2023 along with the Administration of Criminal Justice Law of Nasarawa State 2018 as they bear on the use of AI in forensic investigation and the admissibility of AI-generated evidence. This analysis draws on both the text of these instruments and authoritative secondary sources academic commentaries, judicial interpretations, and law reform commission reports to construct a coherent account of the existing legal position.

The socio-legal dimension of the research recognises that law does not operate in a vacuum but is embedded in social institutions and processes.[44] This dimension is pursued through the analysis of institutional documents including policy, administrative guidelines, and annual reports published by the Nigeria Police Force, the EFCC, the ICPC, the NDLEA, NITDA, and the Nasarawa State Ministry of Justice. These documents illuminate the gap between the formal legal framework and its practical implementation within the institutions responsible for forensic investigation in the state. Where available, data from the National Bureau of Statistics on crime and security in Nasarawa State has also been incorporated to contextualise the institutional analysis.

The study relies primarily on secondary data sources. These include: academic articles published in peer-reviewed journals of law, criminology, computer science, and forensic science; textbooks and monographs on Nigerian criminal procedure, digital evidence, and technology law; reports and publications of international organisations including the United Nations Office on Drugs and Crime (UNODC), Interpol, Europol, the Organisation for Economic Co-operation and Development (OECD), and the African Union; and legislative documents from foreign jurisdictions particularly the European Union whose regulatory

[43]Ibrahim Sule and Aminu Kofar Naisa, 'Security Challenges in Nasarawa State: Causes and Consequences' (2020) 12(2) Journal of Nigerian Studies 88, 91.

[44]Administration of Criminal Justice Act 2015, s 493; Administration of Criminal Justice Law of Nasarawa State 2016.

frameworks for AI and digital forensics are instructive for the purposes of comparative analysis and law reform recommendations.[45]

In addition, the study employs a comparative legal methodology in Chapter Three, drawing on the Artificial Intelligence regulatory frameworks of selected foreign jurisdictions principally the European Union, the United Kingdom, and the United States to identify best practices that may be adapted to the Nigerian context. The comparative analysis is conducted with due regard to the significant differences in legal tradition, institutional capacity, and technological infrastructure between Nigeria and these jurisdictions, ensuring that the recommendations derived therefrom are both normatively sound and practically feasible within the Nigerian environment.

Critical legal theory informs the analytical framework throughout the study, particularly in the examination of the relationship between AI forensic technologies and the protection of fundamental rights. The study is attentive to the ways in which the design and deployment of Artificial Intelligence systems may reflect and reinforce existing structural inequalities within the Nigerian criminal justice system, and it subjects both the technology and the legal framework governing it to critical scrutiny from the perspective of human rights and social justice. [46] The choice of Nasarawa State as the primary empirical focus is deliberate and methodologically justified. As a state in the North-Central zone that is neither a major metropolitan centre nor among the most historically marginalised, Nasarawa State occupies a position broadly representative of the majority of Nigerian states: it has a functioning but under-resourced criminal justice infrastructure, documented security challenges that create genuine demand for enhanced forensic investigative capacity, and a legislative framework that mirrors the federal position without significant local innovation. Findings derived from the Nasarawa State context are therefore likely to be broadly applicable across comparable Nigerian states, lending the study a generalisability beyond its immediate geographical focus.

The study is structured in five chapters. Chapter One provides the introductory framework, as set out in this chapter. Chapter Two constructs the conceptual and theoretical framework and reviews the existing literature. Chapter Three examines the legal and institutional framework governing Artificial Intelligence in forensic investigation in Nigeria. Chapter Four analyses the challenges and prospects of the legal role of Artificial Intelligence in forensic crime investigation. Chapter Five presents the summary of findings, recommendations, and conclusion of the study.

Challenges Confronting Artificial Intelligence

The problems bedeviling the role of artificial intelligence in Nasarawa State, Nigeria forensic

[45] Chidi Odinkalu, 'Why More Africans Don't Use Human Rights Language' (1999) Carnegie Council on Ethics and International Affairs; see also Osita Ogbu, 'Law and Social Transformation in Africa' (Enugu: CIDJAP Publications 1999) 34.

[46] Ibrahim Gambari, 'Technology-Driven Governance and Security in Nigeria' (Lecture, National Institute for Policy and Strategic Studies, Kuru, 2023) 12.

investigation under the administration of justice system anchored on the lack of robust legal frameworks, inadequate technological infrastructure and limited expertise. There is difficulty in the algorithmic bias reproducing discrimination against suspect and data corruption led to the danger in artificial intelligence because algorithms trained on historical data may inadvertently produce biased predictions, targeting certain unjust legal outcome. To adumbrate also the menace of black box nature of artificial intelligence complicating evidence verification in the court system.

Furthermore, the tools used for analyzing evidence such as Deoxyribonucleic Acid DNA, facial recognition often does not explain their decision-making processes, making its difficulty for legal practitioners to cross-examine or challenge forensic evidence in the court processes. The obstacles of data integrity and security risks are high implementation costs. The vulnerability to hacking, data manipulation, mutilation, suppression, or alteration of evidence by Artificial Intelligence algorithms present risk to the administration of justice. Notwithstanding the global momentum toward the integration of Artificial Intelligence in forensic crime investigation, Nigeria and Nasarawa State in particular face a critical governance deficit in this domain. The central problem animating this research is the absence of a coherent, comprehensive, and contextually appropriate legal framework to regulate the deployment, operation, and evidentiary use of Artificial Intelligence driven forensic tools within the Nigerian criminal justice system.

The existing legislative architecture comprising the CFRN 1999, the ACJA 2015, the Evidence Act 2023, and the Cybercrimes Act 2015 was not designed with Artificial Intelligence forensic technologies in mind. These instruments contain provisions for electronic and computer-generated evidence but fail to grapple with the specific characteristics of Artificial Intelligence outputs: their probabilistic nature, the opacity of machine learning algorithms, the absence of a human author capable of giving sworn testimony as to the accuracy of the output, and the systemic risks of algorithmic bias. [47] Institutionally, the agencies responsible for forensic investigation in Nasarawa State principally the Nigeria Police Force and, to a lesser extent, the EFCC, ICPC, and NDLEA lack both the technical infrastructure and the trained personnel necessary to deploy Artificial Intelligence forensic tools effectively. More critically, in the absence of binding guidelines, the use of any Artificial Intelligence -derived data in investigation or prosecution proceeds without standardised protocols, creating serious risks to the integrity of the evidentiary process and the fairness of criminal proceedings.[48]

This legal and institutional vacuum has practical consequences: legitimate Artificial intelligence-assisted investigations may collapse at the point of prosecution due to

[47]Abdullahi Ahmed An-Na'im, 'Human Rights in the Arab World' (University of Pennsylvania Press 2001) 22; see also Nigerian Bar Association, 'Technology and Access to Justice' (NBA Position Paper, Lagos 2021) 10.

[48]Rashida Richardson, Jason M Schultz and Kate Crawford, 'Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice' (2019) 94 New York University Law Review Online 192, 196.

inadmissibility rulings; evidence obtained through Artificial Intelligence tools may be admitted without adequate scrutiny of its reliability; and fundamental rights to privacy, to a fair hearing, and to equality before the law may be systematically violated. This study seeks to interrogate these problems and to propose a normative framework adequate to the challenges they present.[49]

Theoretical Framework

The theoretical framework of a study provides the intellectual lenses through which the research problem is analysed and interpreted. It grounds the inquiry within established traditions of scholarly thought, providing both explanatory power and normative direction. This study employs three theoretical frameworks: Technological Determinism Theory; Socio-Legal Theory; and Systems Theory of Criminal Justice. Each framework illuminates a distinct dimension of the relationship between AI, forensic investigation, and the administration of criminal justice in Nigeria.

Technological Determinism Theory

Technological Determinism is a theoretical tradition that holds that technology is a primary driver of social change, shaping the structures, processes, and values of the societies in which it is deployed.[50] In its strong or "hard" form, technological determinism posits that technological development follows an autonomous, internally driven logic that is independent of social forces and that ultimately compels social adaptation: society must conform to the imperatives of the technology, not the reverse. In its "soft" form which most contemporary scholars endorse technological determinism acknowledges the role of social, political, and institutional factors in shaping how technologies are designed and deployed, while maintaining that deployed technologies do, in turn, significantly reshape social structures and practices.[51]

The relevance of technological determinism to this study is threefold. First, it provides a descriptive account of the current situation in criminal justice globally: the development and commercial deployment of AI forensic tools is generating pressure on legal systems to adapt to develop admissibility standards, oversight mechanisms, and rights-protection frameworks adequate to these new technologies. This adaptive pressure is observable in the Nigerian context, where the promulgation of the Nigeria Data Protection Act 2023 and ongoing debates about AI governance reflect the system's response to the technological imperative.[52]

Second, technological determinism alerts us to the risks of passive or uncritical adaptation. Where legal and institutional frameworks simply accommodate the logic of AI forensic tools without critically interrogating their design assumptions, training data quality, and potential

[49]Nigeria Data Protection Act 2023, s 2, 24.
[50]Langdon Winner, 'Do Artifacts Have Politics?' (1980) 109(1) Daedalus 121, 122.
[51]Marshall McLuhan, Understanding Media: The Extensions of Man (McGraw-Hill 1964) 7–8.
[52]Virginia Eubanks, Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor (St Martin's Press 2018) 12.

for discriminatory application, the result may be the encoding of existing social inequalities within the justice system.[53] This risk is particularly acute in Nigeria, where the historical data upon which predictive policing algorithms might be trained reflects patterns of policing that have themselves been shaped by corruption, ethnic bias, and socio-economic inequality.

Third, the soft determinist insight that society can and must actively shape the trajectory of technological deployment through deliberate normative choice provides the theoretical justification for the law reform recommendations advanced in Chapter Five of this study. The argument is not that AI forensic tools are inherently incompatible with Nigerian criminal justice, but that their deployment must be governed by a carefully designed legal framework that harnesses their investigative potential while safeguarding the rights of accused persons and the integrity of the justice process.

Socio-Legal Theory

Socio-Legal Theory also referred to as Law and Society scholarship or social-legal studies proceeds from the foundational premise that law cannot be adequately understood in isolation from the social context in which it operates.[54] Legal rules, institutions, and processes are embedded in, shaped by, and reciprocally constitutive of broader social, economic, political, and cultural structures. To study law as a purely textual or logical system the domain of classical legal positivism is therefore to produce an incomplete and potentially misleading account of how law actually functions.

Socio-legal theory as deployed in this study performs several analytical functions. It directs attention to the gap between the formal legal framework governing AI in forensic investigation as expressed in statutory texts, judicial decisions, and administrative guidelines and the lived reality of forensic practice within Nasarawa State law enforcement institutions.[55] In a context where law enforcement agencies may lack the technical capacity to comply with legally mandated evidential protocols, where corruption may distort the application of those protocols, and where institutional cultures may resist the integration of technologically sophisticated investigative methods, this gap is likely to be significant. Socio-legal analysis illuminates these dynamics in ways that purely doctrinal analysis cannot.

Systems Theory of Criminal Justice

Systems Theory, as applied to criminal justice, conceptualises the totality of criminal justice institutions and processes law enforcement, prosecution, courts, corrections, and rehabilitation as an integrated, interdependent system in which each component affects and is affected by every other component.[56] The foundational insights of systems theory derive from

[53]Rashida Richardson, Jason M Schultz and Kate Crawford, 'Dirty Data, Bad Predictions' (2019) 94 New York University Law Review Online 192, 198.

[54]Roger Cotterrell, The Sociology of Law: An Introduction (2nd ed., Butterworths 1992) 8–9.

[55]David Nelken, 'Socio-Legal Studies: Beyond Divide?' in Philip Thomas (ed), Socio-Legal Studies (Dartmouth 1997) 3, 5.

[56]Norbert Wiener, The Human Use of Human Beings: Cybernetics and Society (Houghton Mifflin 1950) 15.

the work of Norbert Wiener on cybernetics and were developed in the legal context by theorists including Niklas Luhmann, who argued that the legal system is a self-referential, operationally closed but cognitively open social system that reproduces itself through its own internal logic while remaining responsive to inputs from its social environment.

For the purposes of this study, systems theory provides a framework for understanding how the introduction of AI forensic tools at the investigative stage of the criminal justice process generates ripple effects throughout the entire system. [57] The admission of AI-generated evidence at the prosecution stage requires corresponding adaptations in judicial standards of admissibility. The use of AI surveillance tools by law enforcement requires corresponding adaptations in prosecutorial disclosure obligations. The potential for AI-assisted case prediction to influence sentencing decisions requires corresponding adaptations in appellate review mechanisms. Systems theory insists that these interdependencies be taken seriously in any analysis of AI and criminal justice: an AI governance framework that addresses only the investigative stage, without attending to the downstream systemic implications for prosecution, adjudication, and sentencing, will be fundamentally incomplete.

Legal Framework of the Legal Role of Artificial Intelligence in Forensic Crime Investigation Under the Administration of Criminal Justice System in Nigeria

The legal framework governing the use of Artificial Intelligence in forensic crime investigation in Nigeria is not contained in a single, dedicated instrument but is instead distributed across a range of constitutional provisions, statutes, and regulatory guidelines that together define the normative environment within which AI forensic tools must operate. This section examines seven principal legal instruments: The Constitution of the Federal Republic of Nigeria 1999 (as amended); the Administration of Criminal Justice Act 2015; the Evidence Act 2011; the Cybercrimes (Prohibition, Prevention, etc.) Act 2015; the Nigeria Data Protection Act 2023; the NITDA Guidelines and Regulations; and relevant International and Regional Instruments on Artificial Intelligence and Digital Evidence.

Constitution of the Federal Republic of Nigeria 1999 (as amended)

The Constitution of the Federal Republic of Nigeria 1999 (as amended) occupies the apex of Nigeria's legal hierarchy and provides the foundational constitutional framework within which any deployment of AI in forensic investigation must be assessed. [58] As the supreme law of the land, the Constitution's provisions override any inconsistent statutory or regulatory instrument, and any AI forensic governance framework that fails to comply with its requirements is liable to be struck down by the courts. Of particular relevance to the legal role of AI in forensic investigation are the fundamental rights provisions contained in Chapter IV of the Constitution. Section 34 guarantees every person's right to dignity of the human person, prohibiting torture, inhuman or degrading treatment protections that are directly implicated where AI-assisted interrogation tools or physiological analysis systems are

[57] Niklas Luhmann, Law as a Social System (Oxford University Press 2004) 60–63.

[58] Constitution of the Federal Republic of Nigeria 1999 (as amended), s 1(1); Attorney General of the Federation v Attorney General of Abia State [2002] 6 NWLR (Pt 764) 542.

deployed without adequate safeguards. Section 35 guarantees the right to personal liberty, a right violated where AI-generated evidence erroneously identifies an innocent person as a suspect, resulting in unlawful arrest or pre-trial detention.[59]

Section 37 guarantees the right to privacy of citizens, their homes, correspondence, telephone conversations, and telegraphic communications. In the context of AI forensic investigation which may involve the mass collection and analysis of communications data, location data, biometric information, and social media activity this provision is of central importance.[60] The constitutional right to privacy imposes a proportionality requirement on law enforcement use of AI surveillance and data-collection tools: the privacy intrusion occasioned by AI forensic data collection must be proportionate to the legitimate investigative aim pursued. Section 36 guarantees the right to a fair hearing, encompassing the right to be presumed innocent until proven guilty and the right to be adequately informed of the evidence against oneself.[61] Where AI-generated forensic evidence is tendered against an accused person in circumstances that make it impossible for the accused to effectively challenge the reliability or accuracy of that evidence due to the opacity of the underlying algorithm the constitutional guarantee of a fair hearing is potentially compromised. The Constitution thus establishes the overarching rights framework within which the more specific legal instruments governing AI forensic investigation must be interpreted and applied.

Administration of Criminal Justice Act (ACJA) 2015

The Administration of Criminal Justice Act 2015 is the principal statute governing criminal procedure at the federal level in Nigeria, and its provisions are adopted with minor modifications by the Administration of Criminal Justice Law of Nasarawa State 2016. The Act was enacted with the overarching objectives of ensuring the speedy disposal of criminal cases, protecting the rights of suspects, defendants, and victims, and promoting efficient management of criminal justice institutions.[62] The ACJA contains several provisions of direct relevance to the use of AI in forensic investigation. Section 232(1) provides for the admission of electronically recorded evidence of confessional statements made by suspects, requiring that such statements be recorded on video and audio media where facilities exist. This provision anticipates the use of recording technology and by extension, AI-powered voice and video analysis tools in the evidentiary process.[63] Sections 255 to 259 of the Act address the management and preservation of exhibits, including electronic exhibits, establishing chain-

[59] Constitution of the Federal Republic of Nigeria 1999 (as amended), ss 34, 35, 36, 37.

[60] ibid, s 37; Registered Trustees of Incorporated Trustees of the Socio-Economic Rights and Accountability Project (SERAP) v Federal Republic of Nigeria & Ors (Unreported, ECOWAS Community Court of Justice, Suit No. ECW/CCJ/APP/08/09, 2010).

[61] ibid, s 36(1); see also Ariori v Elemo [1983] 1 SCNLR 1; Okoro v The State [1988] 5 NWLR (Pt 94) 255.

[62] Administration of Criminal Justice Act 2015, Long Title; see also Muhammed Tawfiq Ladan, 'Reform of Criminal Justice Administration in Nigeria: The ACJA 2015 in Context' (2016) 1(1) Nigerian Criminal Law Review 1, 4.

[63] Administration of Criminal Justice Act 2015, s 232(1); see also Okey Ajoku v The State [2019] LPELR-46945(CA).

of-custody requirements that are directly applicable to digital evidence obtained through AI forensic tools.

However, the ACJA 2015 does not contain any provision specifically addressing the use of AI as an investigative instrument or the admissibility of AI-generated forensic outputs. The Act's provisions on electronic evidence and digital records, while progressive at the time of enactment, were drafted before the widespread deployment of machine learning-based forensic tools and therefore do not grapple with the specific characteristics of AI outputs their probabilistic nature, algorithmic opacity, and sensitivity to training data quality. [64] This legislative gap creates significant uncertainty for law enforcement practitioners seeking to deploy AI forensic tools in compliance with the Act's requirements, and for courts called upon to assess the admissibility of AI-generated evidence under its provisions. Reform of the ACJA to incorporate specific provisions addressing AI forensic tools is among the legislative recommendations advanced in Chapter Five of this study.

Evidence Act 2011 as Amended 2023

The Evidence Act 2011 is the primary statute governing the admissibility of evidence in Nigerian courts and is directly applicable to the admissibility of AI-generated forensic outputs in criminal proceedings. The Act's most significant provision for present purposes is Section 84, which sets out the conditions for the admissibility of statements contained in documents produced by computers.[65]

Section 84 requires, for the admission of a computer-generated statement, that the computer was used regularly to store or process information of the kind contained in the statement during the material period; that the information was supplied in the ordinary course of the relevant activities; that the computer was operating properly throughout; and that the statement either reproduces or is derived from information supplied to the computer in the ordinary course of activities. Where these conditions are satisfied, the court may admit the statement as evidence of any fact stated therein. A certificate signed by a person occupying a responsible position in relation to the operation of the computer is admissible as evidence of the matters stated therein without further proof.[66]

The application of Section 84 to AI-generated forensic outputs raises profound interpretive challenges. First, the requirement that the computer was "operating properly" is difficult to apply to machine learning systems whose outputs are inherently probabilistic an AI facial recognition system that correctly identifies a suspect 95% of the time is not "operating improperly" when it produces an incorrect identification in 5% of cases; that error rate is a designed characteristic of the system. Second, the certificate requirement under Section 84(4) is ill-adapted to AI forensic tools, whose operation is typically the product of complex proprietary algorithms developed by commercial vendors rather than by the law enforcement

[64] Administration of Criminal Justice Act 2015, ss 255–259; see also Muhammed Tawfiq Ladan (n 5) 8.
[65] Evidence Act 2011 (Nigeria), s 84(1)–(4).
[66] FRN v Iwu [2016] LPELR-40011(SC); Kubor v Dickson [2012] 15 NWLR (Pt 1324) 417, 497–498.

agency deploying them. [67] Third, the Act does not address the admissibility of predictive analytics outputs or risk assessment scores generated by AI systems, which differ fundamentally from the document-based computer outputs originally contemplated by the drafters of Section 84. The reform of Section 84 to address these challenges is essential to the development of a coherent legal framework for AI forensic evidence in Nigeria.

Cybercrimes (Prohibition, Prevention, etc.) Act 2015

The Cybercrimes (Prohibition, Prevention, etc.) Act 2015 was enacted to provide an effective and unified legal, regulatory, and institutional framework for the prohibition, prevention, detection, prosecution, and punishment of cybercrimes in Nigeria. [68] While the Act is primarily concerned with defining and criminalising cyber offences including hacking, identity theft, cyberstalking, and the distribution of child sexual abuse material it also contains provisions of relevance to digital evidence and forensic investigation that intersect with the deployment of AI forensic tools.

Sections 37 to 39 of the Act address the preservation, retention, and disclosure of computer data by service providers during criminal investigations. These provisions empower law enforcement agencies to require service providers to preserve traffic data and subscriber information for specified periods and to disclose such data upon the order of a competent court or authority. [69] These data preservation and disclosure powers are directly relevant to AI forensic investigation, since many AI forensic tools including network analysis, social graph mapping, and communications monitoring systems rely on access to data held by telecommunications operators and internet service providers. The Cybercrimes Act thus provides the legal basis for law enforcement access to some categories of data that AI forensic tools require, but it does not regulate how those tools may process or analyse that data once accessed, nor does it address the admissibility of AI-processed outputs derived from preserved data. Section 45 of the Cybercrimes Act empowers the Attorney General of the Federation, in consultation with the relevant minister, to make regulations for the implementation of the Act. No such regulations specifically addressing AI forensic tools have yet been made, representing a significant regulatory gap given the rapid growth in AI-powered digital investigation capabilities available to Nigerian law enforcement agencies. [70] The exercise of this regulatory power to develop AI forensic guidelines would represent an important interim step pending the enactment of comprehensive AI governance legislation, and is among the recommendations advanced in Chapter Five of this study.

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[67] Evidence Act 2011, s 84(4); Dickson Ogbonnaya Igwe, 'Electronic Evidence and the Nigerian Courts' (2019) 7 Afe Babalola University Journal of Sustainable Development Law and Policy 55, 61.

[68] Cybercrimes (Prohibition, Prevention, etc.) Act 2015, s 1.

[69] ibid, ss 37–39; see also Uche Eke, 'Cybercrime Legislation and Digital Evidence in Nigeria' (2020) 8(1) Journal of Digital Law and Policy 14, 17.

[70] Cybercrimes Act 2015, s 45; see also Tunde Ogowewo, 'The Admissibility of Electronic Evidence in Nigerian Criminal Proceedings' (2017) 6 Lagos Law Review 110, 115.

Institutional Framework of The Legal Role of Artificial Intelligence in Forensic Crime Investigation Under the Administration of Criminal Justice System in Nigeria

The institutional framework for forensic crime investigation in Nigeria encompasses a range of law enforcement agencies, regulatory bodies, prosecutorial institutions, and international partners whose mandates, capacities, and operations collectively shape the environment within which AI forensic tools are or could be deployed. This section examines eight principal institutions: the Nigeria Police Force; the Economic and Financial Crimes Commission; the Independent Corrupt Practices and Other Related Offences Commission; the National Drug Law Enforcement Agency; the National Identity Management Commission; the National Information Technology Development Agency; the Ministry of Justice and the Judiciary; and International Cooperation Partners.

Challenges of The Legal Role of Artificial Intelligence in Forensic Crime Investigation Under the Administration of Criminal Justice System in Nigeria

The integration of Artificial Intelligence into forensic crime investigation under the Nigerian criminal justice system confronts a complex array of challenges that are simultaneously legal, institutional, technical, ethical, and social in character. These challenges are not merely theoretical; they are the lived operational reality of law enforcement agencies in Nasarawa State and across Nigeria. Understanding them with clarity and precision is a precondition for the design of a governance framework capable of addressing them. This section identifies and critically analyses eight principal challenges.

Inadequate Legal and Regulatory Framework

The most fundamental challenge confronting the legal role of AI in forensic crime investigation in Nigeria is the absence of a comprehensive, dedicated, and operationally specific legal framework governing the deployment, use, and evidentiary presentation of AI forensic tools. As the analysis in Chapter Three demonstrated, the existing legislative architecture comprising the CFRN 1999, the ACJA 2015, the Evidence Act 2011, the Cybercrimes Act 2015, and the Nigeria Data Protection Act 2023 was not designed with AI forensic technologies in mind and contains no provisions that directly address the distinctive legal questions they raise.[71]

The Evidence Act 2011's Section 84, while providing a framework for computer-generated evidence, does not grapple with the probabilistic nature of AI outputs, the opacity of machine learning algorithms, or the challenge of establishing the reliability of AI-generated forensic analysis in court.[72] In technologically advanced jurisdictions, dedicated AI legislation such as the EU AI Act 2024, which classifies AI forensic tools as high-risk applications subject to

[71] NITDA, 'National Artificial Intelligence Policy for Nigeria' (Draft Framework, 2023) 3; see also Babatunde Fagbayibo, 'Data Protection and the Rule of Law in Nigeria' (2023) 15(2) African Journal of International and Comparative Law 180, 182.

[72] Evidence Act 2011 (Nigeria), s 84; Administration of Criminal Justice Act 2015, s 232; see also Dickson Ogbonnaya Igwe, 'Electronic Evidence and the Nigerian Courts' (2019) 7 Afe Babalola University Journal of Sustainable Development Law and Policy 55, 60.

conformity assessments, transparency requirements, and human oversight mandates provides a model for how this gap might be closed. [73] Nigeria's Draft National AI Policy remains non-binding and lacks the operational specificity required to guide law enforcement practice. The result is a regulatory vacuum in which law enforcement agencies, prosecutors, and courts operate without clear legal standards, creating conditions for both the wrongful exclusion of legitimate AI forensic evidence and the uncritical admission of unreliable AI outputs. This legislative gap is compounded at the state level. The Administration of Criminal Justice Law of Nasarawa State 2016 mirrors the federal ACJA without introducing any AI-specific provisions. In the absence of federal AI forensic legislation, Nasarawa State courts and law enforcement agencies lack even the minimum normative guidance required to navigate the admissibility and reliability questions that AI forensic evidence raises. Legislative reform at both federal and state levels is the primary remedy for this challenge, as this study argues in its Chapter Five recommendations.

Lack of Technical Expertise and Skilled Personnel

A pervasive and deeply rooted challenge to the effective deployment of AI forensic tools in Nasarawa State and across Nigeria is the critical shortage of technically trained personnel within law enforcement agencies. Effective deployment of AI forensic tools requires personnel with specialised expertise across multiple domains: computer science and machine learning, to understand how AI systems work and what their outputs mean; digital forensics, to ensure that electronic evidence is properly collected, preserved, and processed; and law, to ensure that AI-assisted investigations comply with evidentiary and procedural requirements. [74]

The Nigeria Police Force, which bears primary responsibility for criminal investigation in Nasarawa State, is acutely deficient in all three of these areas of expertise. The NPF's forensic science capacity is concentrated in a small number of zonal commands and the force-level forensic laboratory in Abuja, with minimal forensic science capability at the state and divisional levels where the vast majority of investigations are conducted. [75] Officers at the operational level those responsible for crime scene management, evidence collection, and preliminary investigation have minimal exposure to digital forensic techniques and virtually no training in the use of AI investigative tools. This skills deficit means that even if AI forensic tools were procured and deployed, the personnel responsible for operating them would lack the capacity to do so effectively or in compliance with evidential requirements.

Addressing this challenge requires a sustained, multi-level investment in human capacity development: the establishment of specialised digital forensic units within the NPF and other law enforcement agencies, staffed by personnel with appropriate technical qualifications; the

[73] European Union, Regulation (EU) 2024/1689 (Artificial Intelligence Act), Arts 9, 13; Council of Europe, Framework Convention on AI (CETS No 225, 2024), Art 9.

[74] Oyewole Abayomi, 'Forensic Science Practice in Nigeria: Current State and Future Directions' (2021) 3(1) Nigerian Journal of Forensic Science 1, 6.

[75] ibid 7; Nigeria Police Force, 'Annual Report on Crime Statistics' (NPF Headquarters, Abuja 2022) 24.

development of pre-service and in-service training curricula incorporating AI forensic techniques; and the creation of partnerships with universities and technical institutions for the training of forensic science professionals. [76] The UNODC and INTERPOL provide technical assistance and training programmes that could accelerate this capacity-building effort, [77] but international support cannot substitute for sustained domestic investment in forensic science education and professional development.

Data Privacy and Security Concerns

The deployment of AI forensic tools in criminal investigation raises profound data privacy and security concerns that constitute a significant legal and operational challenge for Nigerian law enforcement agencies. AI forensic systems whether facial recognition tools, communications monitoring platforms, or predictive policing algorithms operate by processing large volumes of personal data, including sensitive categories such as biometric information, health data, political opinions, and information about criminal history. The legal basis for the collection, processing, and retention of such data by law enforcement agencies must be clearly established and consistently maintained if the constitutional right to privacy under Section 37 of the CFRN 1999 and the data protection rights under the Nigeria Data Protection Act 2023 are to be respected.[78]

A particular concern is the risk of mass surveillance. AI-powered surveillance tools including facial recognition systems linked to CCTV networks, mobile device interception systems, and social media monitoring platforms enable law enforcement agencies to collect personal data on a scale and with a granularity that was previously impossible. This surveillance capacity creates serious risks of disproportionate intrusion into the privacy of citizens who are not the subject of any specific criminal investigation, effectively subjecting the entire population to ambient surveillance as a by-product of AI-assisted law enforcement.[79]

Nigeria's Data Protection Act 2023 provides some safeguards against these risks, including the right not to be subjected to solely automated decisions with significant legal effects under Section 31, and the requirement that data processing be proportionate to its specified purpose under Section 24. [80] However, the enforcement of these provisions against law enforcement agencies which operate in a context of institutional opaqueness and limited judicial oversight is likely to be challenging in practice. The development of specific data protection guidelines

[76]Olu Ikebuiro, 'Digital Transformation of Nigerian Public Institutions: An Assessment' (2022) 5(2) African Journal of Governance and Development 44, 48.

[77]UNODC, 'Cybercrime Module 6: Practical Aspects of Cybercrime Investigations and Digital Forensics' (2019) <https://www.unodc.org/e4j> accessed 5 March 2025.

[78]Constitution of the Federal Republic of Nigeria 1999 (as amended), ss 37, 45; Nigeria Data Protection Act 2023, ss 24, 31.

[79]Nita A Farahany, The Battle for Your Brain: Defending the Right to Think Freely in the Age of Neurotechnology (St Martin's Press 2023) 52; see also Privacy International, 'Privacy and Law Enforcement' (Privacy International Report 2021) 9.

[80]Nigeria Data Protection Act 2023, s 31; Emeka Amechi, 'Lawful Basis for Processing Personal Data under the Nigeria Data Protection Act 2023' (2024) 3(1) Nigerian Technology Law Review 22, 27.

for law enforcement use of AI forensic tools, consistent with the NDP Act 2023 and the constitutional right to privacy, is an urgent regulatory requirement that this study identifies as a priority recommendation in Chapter Five.

High Cost of AI Technology and Infrastructure

The financial cost of AI forensic technology encompassing software licences, hardware infrastructure, cloud computing capacity, system maintenance, and personnel training represents a formidable barrier to adoption for most Nigerian law enforcement agencies, particularly those operating at the state level and below. State-of-the-art AI forensic platforms such as commercial facial recognition systems, automated DNA analysis tools, and AI-powered digital forensic workstations command procurement prices that are prohibitive for agencies whose annual budgets are insufficient to maintain even basic operational equipment.[81]

The infrastructural prerequisites for AI forensic deployment compound the cost challenge. Effective operation of AI forensic tools requires reliable high-speed internet connectivity, consistent electricity supply, sophisticated hardware capable of processing large datasets in reasonable time, and secure data storage infrastructure. In Nasarawa State and across much of Nigeria, all four of these prerequisites are frequently absent or unreliable: internet connectivity is intermittent, particularly outside urban centres; electricity supply is characterised by prolonged outages that would disrupt AI system operations; the hardware infrastructure of law enforcement agencies is outdated; and secure digital storage facilities are largely non-existent below the federal level.[82]

Admissibility of AI-Generated Evidence in Court

The admissibility of AI-generated forensic evidence in Nigerian courts represents one of the most immediate and practically consequential challenges identified in this study. As demonstrated in Chapter Three, Section 84 of the Evidence Act 2011 provides the primary legal basis for the admission of computer-generated statements in Nigerian courts but was not designed to address the distinctive characteristics of AI-generated forensic outputs. These outputs whether facial recognition match reports, predictive policing risk scores, or AI-generated DNA analysis summaries differ fundamentally from conventional computer-generated documents in ways that Section 84's conditions do not adequately capture.[83] The Nigerian courts have not yet developed a settled jurisprudence on the admissibility of AI forensic evidence, and the decisions that do exist on electronic evidence admissibility reveal significant judicial inconsistency. In FRN v Iwu, the Supreme Court emphasised the importance of strict compliance with the certificate requirement under Section 84(4) as a

[81] World Bank, 'Nigeria Digital Economy Diagnostic Report' (World Bank Group 2019) 18; see also Deloitte, 'Digital Infrastructure in Sub-Saharan Africa' (Deloitte Insights 2022) 11.

[82] International Telecommunications Union (ITU), 'Measuring the Information Society Report 2023' (ITU 2023) 45; Ikebuiro (n 6) 50.

[83] Evidence Act 2011, s 84(1)–(4); Tunde Ogowewo, 'The Admissibility of Electronic Evidence in Nigerian Criminal Proceedings' (2017) 6 Lagos Law Review 110, 116.

condition precedent to the admission of computer-generated evidence a requirement that creates particular difficulties for AI forensic outputs generated by complex, multi-component systems where no single person can be said to occupy a "responsible position" in relation to the operation of the entire system.[84]

Corruption and Institutional Weaknesses

Corruption and institutional weakness within Nigerian law enforcement agencies and the judiciary constitute a systemic challenge that cuts across all dimensions of AI forensic governance. Nigeria's consistently poor performance on international anti-corruption indices reflects the reality that corrupt practices including bribery, evidence tampering, and the selective application of the law are deeply embedded within the institutions responsible for criminal investigation and prosecution.[85] The introduction of AI forensic tools into this environment creates both new risks and new opportunities.

The risks are significant. AI forensic tools, like any investigative instrument, can be misused by corrupt actors: facial recognition systems can be used to surveil political opponents or blackmail individuals; AI-generated evidence can be fabricated or manipulated by technically sophisticated actors within law enforcement; and predictive policing systems can be configured to target communities or individuals on discriminatory or politically motivated grounds rather than on the basis of legitimate law enforcement objectives.[86] The opacity of AI algorithms which makes it difficult for external actors to scrutinise the basis for AI-generated outputs creates particular risks in a context of weak institutional accountability, since corrupt manipulation of AI systems may be harder to detect and challenge than traditional evidence tampering.

Limited Public Awareness and Trust in Artificial Intelligence Systems

A final but significant challenge is the limited public awareness of AI forensic technologies and the consequent deficit of public trust in their application within the Nigerian criminal justice system. Survey data from Afrobarometer consistently shows that trust in Nigerian law enforcement institutions and in the police in particular is among the lowest in sub-Saharan Africa, with a substantial proportion of Nigerian citizens expressing the view that the police are corrupt, that they treat citizens unfairly, and that the criminal justice system does not serve the interests of ordinary people.[87]

In this context of pre-existing institutional distrust, the introduction of AI forensic tools which may be perceived as extending the coercive and surveillance capabilities of an already distrusted police force risks deepening public alienation rather than enhancing confidence in

[84] FRN v Iwu [2016] LPELR-40011(SC); see also Kubor v Dickson [2012] 15 NWLR (Pt 1324) 417.

[85] Transparency International, 'Corruption Perceptions Index 2023' (Transparency International 2024) 12; see also Human Rights Watch, 'Nigeria: Police Corruption and Brutality' (HRW Report 2020) 8.

[86] Virginia Eubanks, Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor (St Martin's Press 2018) 22.

[87] Afrobarometer, 'Trust in Institutions: Evidence from Nigeria' (Afrobarometer Dispatch No. 576, 2022) 3.

the justice system. Research in the Nigerian context has documented widespread public scepticism about the integrity of forensic evidence, reflecting a reasonable concern grounded in documented experience that law enforcement agencies may manipulate or fabricate evidence to support predetermined investigative conclusions.[88] AI forensic outputs, whose production is opaque and whose reliability is difficult for non-experts to assess, may be perceived as providing a technological veneer of objectivity to processes that remain fundamentally subject to human manipulation.

Prospects of the Legal Role of Artificial Intelligence in Forensic Crime Investigation Under the Administration of Criminal Justice System in Nigeria

Notwithstanding the formidable challenges catalogued in the preceding section, the prospects for the effective, rights-compliant integration of Artificial Intelligence into forensic crime investigation under the Nigerian criminal justice system are real and substantial. The same conditions that create challenges Nigeria's scale, its growing digital economy, its international partnerships, and the mounting pressure for criminal justice reform also create opportunities. This section examines eight principal prospects, each grounded in the current trajectory of institutional, legislative, and technological development.

Discussion of Findings

This study set out to examine the legal role of Artificial Intelligence in forensic crime investigation under the administration of criminal justice in Nasarawa State, Nigeria. It was guided by four research questions: the state of the existing legal and institutional framework; the challenges impeding effective AI forensic governance; the prospects for enhanced AI deployment; and the reforms required to ensure rights-compliant AI forensic integration. The inquiry has yielded findings of considerable significance, spanning the doctrinal, institutional, ethical, and comparative dimensions of the subject.

The first and most foundational finding of this study is that Nigeria currently lacks a coherent, dedicated legal framework governing the deployment, operation, and evidentiary use of Artificial Intelligence in forensic crime investigation. The existing legislative architecture comprising the Constitution of the Federal Republic of Nigeria 1999 (as amended), the Administration of Criminal Justice Act 2015, the Evidence Act 2011, the Cybercrimes (Prohibition, Prevention, etc.) Act 2015, and the Nigeria Data Protection Act 2023 was not designed to address the distinctive characteristics of AI forensic tools and contains no provisions that directly resolve the specific legal questions they raise. Section 84 of the Evidence Act 2011, which provides the primary basis for the admission of computer-generated evidence, is inadequate for AI-generated forensic outputs whose probabilistic character, algorithmic opacity, and dependence on training data quality cannot be assessed against its conditions without significant interpretive strain.[89]

[88] Nnamdi Ezechi, 'Public Perception of Policing and Technology in Nigeria' (2021) 9(2) African Security Review 44, 47.

[89] Evidence Act 2011 (Nigeria), s 84; Administration of Criminal Justice Act 2015, ss 232, 255–259; Constitution of the Federal Republic of Nigeria 1999 (as amended), ss 34–37.

The second finding is that the institutional framework for forensic investigation in Nasarawa State and Nigeria more broadly is severely under-resourced and technically unprepared for the effective deployment of AI forensic tools. The Nigeria Police Force the principal investigative agency operates with minimal forensic science capacity at the state and divisional levels, relies predominantly on confessional statements and eyewitness testimony rather than scientific evidence, and lacks both the technical infrastructure and the trained personnel required to deploy AI forensic tools in compliance with evidential requirements. Specialised agencies such as the EFCC have more advanced digital forensic capabilities, but their experience reveals the evidentiary challenges that attend AI forensic deployment in the absence of clear legal standards and protocols.[90]

The third finding is that the deployment of AI forensic tools in the Nigerian criminal justice context carries significant and concrete risks of algorithmic bias, discriminatory application, and disproportionate intrusion into the privacy and other fundamental rights of citizens. These risks are not hypothetical: research has documented the differential accuracy of commercial AI facial recognition systems across demographic groups, the tendency of predictive policing algorithms trained on historically biased datasets to reproduce and amplify those biases, and the disproportionate surveillance burdens that AI-powered law enforcement tools impose on already marginalised communities. In the Nigerian context, these risks are compounded by the documented history of discriminatory policing practices, the weakness of institutional accountability mechanisms, and the limited capacity of the courts to scrutinise AI forensic evidence.[91]

The fourth finding is that the Nigeria Data Protection Act 2023 and NITDA's Draft National AI Policy, while representing significant steps toward a digital governance framework for Nigeria, fall considerably short of the detailed, operationally specific AI forensic governance framework that law enforcement agencies, prosecutors, and courts require. In particular, the NDP Act 2023's provisions on automated decision-making and profiling, while establishing important rights-based safeguards, have not been accompanied by enforcement guidance specifically applicable to law enforcement use of AI tools, leaving a] significant regulatory implementation gap.[92]

The fifth finding is that the prospects for the effective, rights-compliant integration of AI into forensic investigation in Nasarawa State and Nigeria are real and substantial, provided that the legal, institutional, and infrastructural challenges are systematically addressed. The global trajectory toward comprehensive AI governance legislation, Nigeria's growing digital

[90]Oyewole Abayomi, 'Forensic Science Practice in Nigeria: Current State and Future Directions' (2021) 3(1) Nigerian Journal of Forensic Science 1, 6; Nigeria Police Force, 'Annual Report on Crime Statistics' (NPF Headquarters, Abuja 2022) 22.

[91]Rashida Richardson, Jason M Schultz and Kate Crawford, 'Dirty Data, Bad Predictions' (2019) 94 New York University Law Review Online 192, 197; Sandra G Mayson, 'Bias In, Bias Out' (2019) 128 Yale Law Journal 2218, 2228.

[92]Nigeria Data Protection Act 2023, ss 24, 31; NITDA, 'National Artificial Intelligence Policy for Nigeria' (Draft Framework, 2023) 10.

economy, its expanding international law enforcement partnerships with INTERPOL, UNODC, and AFRIPOL, and the demonstrable capacity of AI forensic tools to enhance investigative accuracy and efficiency particularly in cases involving large volumes of digital evidence together create a window of opportunity for transformative reform that this study's recommendations are designed to seize.[93]

Recommendations

In light of the findings summarised above, this study advances the following recommendations, addressed to the National Assembly, the Nasarawa State House of Assembly, the Federal Ministry of Justice, law enforcement agencies, the National Judicial Council, NITDA, and other relevant stakeholders.

First, the National Assembly should enact comprehensive Artificial Intelligence Governance legislation specifically applicable to the use of AI in law enforcement and forensic investigation. Such legislation should, at a minimum, classify AI forensic tools as high-risk applications subject to mandatory pre-deployment conformity assessments, algorithmic impact evaluations, and demographic performance testing. It should establish binding transparency and documentation requirements for law enforcement agencies deploying AI forensic tools, including mandatory maintenance of audit trails for all AI-assisted investigative activities, and should provide for the rights of accused persons to access information about AI tools used in their investigation and to challenge the reliability of AI-generated evidence. The EU AI Act 2024 and the Council of Europe AI Convention 2024 provide instructive models for the structure and content of such legislation, appropriately adapted to the Nigerian constitutional and institutional context.[94]

Second, the National Assembly should amend the Evidence Act 2011 to supplement Section 84 with provisions specifically addressing the admissibility of AI-generated forensic evidence. These amendments should establish the additional foundational requirements that must be satisfied before AI forensic outputs may be tendered in evidence including proof of the tool's validation methodology, its accuracy rates across relevant demographic groups, and the qualifications of the personnel who operated it. The amendments should further provide for the appointment of independent technical assessors to assist courts in evaluating AI forensic evidence in complex cases, and should establish a rebuttable presumption that AI forensic evidence is inadmissible unless the foundational requirements have been satisfied.[95]

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[93]Europol, 'Facing Reality? Law Enforcement and the Challenge of Artificial Intelligence' (Europol Innovation Lab 2022) 14; INTERPOL, 'INTERPOL and Nigeria: Partnership Overview' (INTERPOL General Secretariat 2023) 4.

[94]European Union, Regulation (EU) 2024/1689 (Artificial Intelligence Act), Arts 9, 13, 26; Council of Europe, Framework Convention on AI (CETS No 225, 2024), Arts 3, 9.

[95]Constitution of the Federal Republic of Nigeria 1999 (as amended), s 4; Federal Ministry of Justice, 'Strategic Plan 2021–2025' (Federal Ministry of Justice, Abuja 2021) 10.

Third, the Nasarawa State House of Assembly should amend the Administration of Criminal Justice Law of Nasarawa State 2016 to incorporate specific provisions addressing AI-assisted investigation, consistent with any federal AI forensic governance legislation enacted pursuant to the first recommendation above. Pending such federal legislation, the state should develop and promulgate administrative guidelines governing the use of AI forensic tools by the NPF and other agencies operating within the state, setting minimum standards for documentation, chain of custody, and disclosure of AI-assisted investigative activities.[96]

Conclusion

This study has undertaken a critical examination of the legal role of Artificial Intelligence in forensic crime investigation under the administration of criminal justice in Nasarawa State, Nigeria. Beginning with a mapping of the existing legal and institutional framework, proceeding through an analysis of the challenges and prospects attending AI forensic deployment, and culminating in a set of concrete normative recommendations, the study has demonstrated that the intersection of AI and forensic investigation in the Nigerian criminal justice context is both an urgent practical problem and a rich site of scholarly inquiry. The central conclusion that emerges from the analysis is that Nigeria stands at a defining moment in its engagement with AI forensic technology: the decisions made or deferred in the coming years on the legal governance of AI forensic tools will fundamentally shape the character of criminal justice administration in the country for decades to come.[97]

The study has shown that the promise of AI in forensic investigation enhanced accuracy, greater efficiency, reduced wrongful conviction, improved inter-agency collaboration, and a more reliable evidentiary foundation for criminal proceedings is genuine and substantial. However, it has equally demonstrated that this promise will remain unrealised, and that the risks of discriminatory application, privacy violation, evidence manipulation, and institutional abuse will materialise, unless the deployment of AI forensic tools is governed by a comprehensive, rights-protective legal framework. The framework this study proposes combining dedicated AI governance legislation, amended evidentiary standards, institutional capacity development, judicial guidance, regulatory enforcement, and international cooperation is designed to create the conditions under which the benefits of AI forensic investigation can be realised without sacrificing the fundamental rights and procedural guarantees that the rule of law demands. The experience of technologically advanced jurisdictions, including the European Union and the United Kingdom, confirms that these goals are not irreconcilable: that it is possible to harness the investigative power of AI while maintaining robust constitutional safeguards, provided the political will and institutional capacity for effective governance are mobilised.

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[96]Administration of Criminal Justice Law of Nasarawa State 2016; see also Muhammed Tawfiq Ladan, 'Reform of Criminal Justice Administration in Nigeria: The ACJA 2015 in Context' (2016) 1(1) Nigerian Criminal Law Review 1, 12.

[97]Administration of Criminal Justice Act 2015, s 1; Constitution of the Federal Republic of Nigeria 1999 (as amended), ss 33–44.

For Nasarawa State, the stakes are immediate and concrete. The state's persistent security challenges armed banditry, communal violence, kidnapping, and organised crime create a genuine and pressing demand for enhanced forensic investigative capacity. The citizens of Nasarawa State deserve both effective law enforcement and the protection of their constitutional rights: they deserve a criminal justice system that can detect and prosecute crime with accuracy and speed, and that affords every accused person the full measure of due process that the Constitution guarantees. AI forensic tools, properly governed, have the potential to help deliver both. This study is offered as a contribution to the legal and policy work required to realise that potential and as a call to action for the legislators, policymakers, law enforcement leaders, judicial officers, and civil society actors whose decisions will determine whether Nigeria seizes this opportunity to build a criminal justice system equal to the challenges and the standards of the twenty-first century.

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