

The Challenges of Artificial Intelligence Applications within the Criminal Justice System - A Comparative Analytical Study

<https://doi.org/10.23918/ilic10.48>

Asst. Prof. Dr. Marwa El-Sayed El-Hasawy

Faculty of Law, Mansoura University

Faculty of Law, Helwan University, Arab Republic of Egypt

Online Teaching Experience – King Abdulaziz University, Kingdom of Saudi Arabia

marwaelhasawy@gmail.com

Abstract

Recent years have witnessed fundamental transformations that have reshaped the features of traditional criminal justice. The rapid advancement of technology has redefined the tools and methods used by law enforcement agencies in investigations and judicial prosecutions. Digital evidence, cyber surveillance, and expectations regarding the potential roles of artificial intelligence have become integral to the processes of crime detection and bringing perpetrators to justice.

This paper addresses the concept of criminal justice in the digital context and highlights its differences from the traditional context. It also discusses the new dimensions introduced by digital technology across various stages of criminal procedures, from pre-investigation to investigation, trial, and sentencing, while clarifying the challenges and implications associated with each stage.

Keywords: Digital Technologies, Criminal Procedures, Expeditious Criminal Justice, Applications of Artificial Intelligence, Digital Transformation in the Judiciary.

Introduction

In recent years, the field of criminal justice has undergone profound transformations that have reshaped the foundations of traditional practices. The rapid advancement of technology has redefined the tools and methods relied upon by law enforcement agencies in investigations and prosecutions. Digital evidence, cyber surveillance, and the projected roles of artificial intelligence have increasingly become integral to the processes of crime detection and bringing offenders to justice.

Digital tools such as big data analytics and facial recognition have enhanced the capacity of security authorities to combat certain types of crime. On the other hand, these technologies have raised growing concerns about the expansion of mass surveillance, the misuse of personal data, and algorithmic biases that may result in unfair decisions and violations of fundamental rights.

Furthermore, the increasing reliance on artificial intelligence to identify suspects and support judicial decision-making raises critical questions regarding the transparency of these tools and the possibility of challenging their outcomes. Thus, the central challenge faced by judicial systems and law enforcement authorities is how to strike a balance between strengthening security, upholding justice, and safeguarding public and individual freedoms.

Today, digital technologies are employed in investigation mechanisms, evidence collection, trial procedures, and the execution of penalties. Criminal investigations now heavily depend on evidence extracted from smartphones, social media platforms, and metadata to establish criminal liability. This shift has compelled courts to reconsider the legal standards governing the admissibility and legitimacy of such evidence, which in turn has influenced legislators to introduce reforms to relevant procedural rules.

Research Problem

In light of the above discussion, the following research problem arises: *What are the challenges facing digital criminal justice, and what safeguards are necessary to ensure the trust of litigants in the effectiveness of criminal justice across all its stages?*

Will the world at large, and legal professionals in particular, remain attached to traditional techniques and resistant to adapting to technological advancements under the pretext of preserving legal heritage? Or will they attempt to embrace and integrate these innovations in pursuit of progress and excellence?

It is evident that the technological revolution has awakened societies from stagnation, reshaping and transforming various aspects of life. Yet, it has simultaneously generated concerns, especially among those working in the legal field. With the rise of digital litigation, the concept of the “digital lawyer” has emerged.

This raises a critical question: have these technological solutions become an alternative to human legal practitioners? Indeed, some have sought to resist such developments, believing that doing so would preserve their presence and status. However, this overlooks the fact that technology has already advanced far beyond, and that the real role of legal professionals lies in adapting to these changes and harnessing them in service of justice and the law.

Research Objectives

This study aims to:

1. Clarify the concept of digital criminal justice and highlight its advantages.
2. Examine the implications of expanding the adoption of digital legal procedures and virtual courts.
3. Assess the potential risks posed to defendants' rights, particularly the right to defense, fairness, and transparency of proceedings.
4. Analyze the increasing use of electronic surveillance in the enforcement of penalties and its impact on human dignity.
5. Explore how such technologies affect the individual's right to rehabilitation and reintegration into society.

Research Methodology

This study is based on the following methodological approaches:

1. **Analytical Legal Method**
 - Analyzing the concept of digital criminal justice in light of technological transformations.
 - Examining the legal and technical challenges arising from the integration of digital tools and AI in criminal procedures.
2. **Comparative Method**
 - Comparing legislative experiences that have adopted digital technologies in criminal justice.
 - Studying the similarities and differences between various legal systems:
 - **Civil law systems** (e.g., Egyptian and French legislation – codified rules).
 - **Common law systems** (e.g., U.S. legislation – principles derived from judicial precedents).
 - **Islamic/Sharia-based systems** (e.g., Saudi legislation – rules grounded in Islamic law).
3. **Applied Dimension**
 - Highlighting modern practices in preliminary investigations and criminal trials that have evolved under digitalization.
 - Assessing how these practices contribute to achieving effective, fair, and transparent criminal justice.
 - Applied Dimension: reviewing modern practices in investigations and trials under digitalization.

Research Questions

This study seeks to answer the following questions:

1. What is the concept of digital criminal justice, and what are its main advantages?
2. What are the implications of expanding digital legal procedures and establishing virtual courts?
3. To what extent do digital procedures and AI-based tools affect the rights of defendants, particularly the right to defense and the transparency of proceedings?
4. How does the growing use of electronic surveillance in the enforcement of penalties impact human dignity?
5. In what ways do technological tools influence the individual's right to rehabilitation and reintegration into society?
6. In what ways do technological tools influence the individual's right to rehabilitation and reintegration into society?

Research Hypotheses

1. Digital criminal justice can enhance the efficiency and effectiveness of criminal proceedings if implemented with appropriate legal safeguards.
2. The expansion of digital legal procedures and virtual courts, without sufficient guarantees, may endanger fundamental rights such as the right to defense and fair trial.
3. Algorithmic decision-making in criminal justice systems is prone to bias and lack of transparency, which may undermine public trust in judicial outcomes.
4. Electronic surveillance in the enforcement of penalties raises concerns regarding human dignity and may limit opportunities for rehabilitation and reintegration.

5. Comparative analysis of civil law, common law, and Islamic law systems reveals significant variations in the adoption and regulation of digital criminal justice.

Components of the Research:

Chapter One: The Nature of Traditional and Digital Criminal Justice

1/1 The Concept of Traditional and Digital Criminal Justice.

1/2 The Substantive Aspects of Using Artificial Intelligence in the Criminal Justice System.

Chapter Two: Safeguards of Employing Artificial Intelligence Technologies in Criminal Proceedings

2/1 The Pre-trial Stage.

2/2 The Post-trial Stage (Execution of the Sentence).

Chapter One: The Nature of Traditional and Digital Criminal Justice

Criminal justice rests upon a set of fundamental principles that ensure fair investigation, just trial, and the enforcement of penalties in ways that achieve both deterrence and justice. In the traditional context, these principles were embodied in material procedures such as collecting conventional forensic evidence, questioning witnesses, and safeguarding the rights of defendants before the courts.

Digital developments have not created a rupture with this framework; rather, they have added new dimensions to the traditional reality. Criminal cases now involve modern technological elements without altering the core issues at stake in criminal justice, such as fair trial guarantees, the legality of evidence, and the rights of defense.

Indeed, the recourse of current legislation to modern technologies in the implementation of criminal policy has been part of the modernization of judicial procedures related to justice. This begins with remote investigations, inquiries, trials, and hearings, extends to recognizing electronic forensic evidence on par with traditional evidence, and includes employing modern technologies in the execution of sentences.

All of this aims to confront two emerging phenomena: first, the spread of organizational crimes that do not necessarily stem from a criminally corrupt intent; and second, the spread of cybercrimes committed by intelligent offenders, which require electronic means to address. There is little doubt that these two phenomena have contributed to the accumulation of judgments against individuals with no entrenched criminal history, who have not committed acts representing grave danger, except those that contravene the patterns of a modernized lifestyle.

1/1 The Concept of Traditional and Digital Criminal Justice

First: Criminal Justice

Criminal justice is a comprehensive system that encompasses the laws, procedures, and institutions that deal with crimes before, during, and after their occurrence. It is based on the rights of suspects, convicts, and victims to certain guarantees, as well as on ensuring the prosecution and punishment of offenders in accordance with the law. Criminal justice also refers to two fundamental ideas⁽¹⁾: the protection of the rights of all parties within the criminal justice system, and the government's responsibility to enforce the law, punish offenders, and ensure rehabilitation.

The main components of criminal justice include:

- **The pre-crime stage:** establishing laws and policies to prevent crime.
- **The crime stage:** applying legal procedures to investigate crimes and prosecute offenders.
- **The post-crime stage:** focusing on the follow-up and rehabilitation of offenders, as well as the rehabilitation of victims.

The principles of criminal justice include:

- **Protection of rights:**
The state must safeguard the rights of suspects, convicted criminals, and crime victims at every stage of the process.
- **Government responsibility:**
It is the duty of the state to prosecute and punish offenders to ensure compliance with the law.
- **Balance between deterrence and rehabilitation:**
Criminal justice seeks to deter and reduce crime through penalties while also achieving rehabilitation.

⁽¹⁾ Dorota Jelonek Agata Mesjasz-Lech Cezary Stępnia Tomasz Turek Leszek Ziara, The Artificial Intelligence Application in the Management of Contemporary Organization: Theoretical Assumptions, Current Practices and Research Review, Springer, Cham, 2019, p.33.

- **Principle of impartiality:**

Impartiality in trials and the absence of bias are essential features of justice in all its aspects

Second: Digital Criminal Justice

Achieving swift justice has become a key priority in most countries worldwide. The COVID-19 pandemic played a significant role in reshaping approaches to the development of digital public services, including the judiciary. Many states adopted digitalization of litigation procedures and remote court hearings. In this context, Egypt has launched a digital transformation project for all state institutions, including the judiciary⁽¹⁾.

This transformation aims to shift the judicial working environment from the traditional system—often characterized by delays and procedural complexity—into a digital system that relies on modern technologies to organize the judicial process. This shift contributes to achieving expedited justice through simplified procedures.

New terminology has emerged in the judicial landscape, such as “digital justice,” “virtual courts,” and “criminal justice algorithms.” These terms have become some of the most prominent in today’s judicial and justice sector.

As for criminal justice algorithms⁽²⁾, they refer to computational processes based on data analysis that generate models capable of accurately classifying and describing key data categories. These algorithms rely on past data to produce predictions⁽³⁾. In the criminal justice field, some define them as software capable of searching through collections of previous judgments and judicial decisions in order to extract a specific case file or a text from procedural rules, and so on.

The ultimate goal is to bring administration closer to citizens and reduce the burdens of physical attendance by enabling the electronic management of a case file—from its initiation until final judgment. Parties involved can, after registering, obtain a secure password to access the court’s online system, where they can view their case file (storage of documents, deliberations, hearings, adjournments, etc.) at any stage of litigation, right up to the number of the deliberation chamber and the date of the hearing.

1/2 The Substantive Aspects of Using Artificial Intelligence in the Criminal Justice System

Criminal justice in the digital context requires ensuring the neutrality of the algorithms used in judicial decision-making.⁽⁴⁾ It is essential to guarantee that such algorithms are not biased against certain groups, especially since algorithms may be developed in ways that reflect embedded biases, which could undermine the integrity of trials.

In addition, the principle of **privacy and personal data protection⁽⁵⁾** has emerged as a necessary extension of the principle of individual freedoms, becoming one of the core pillars of criminal justice in the digital context. The spread of digital surveillance and investigative technologies—whether through call recording or the analysis of online activity—may lead to serious violations of individuals’ rights to privacy. Therefore, safeguarding these rights requires strict legislation regulating how personal data is collected and used, and ensuring that neither law enforcement agencies nor technology companies misuse such data.

In light of this, it is crucial for practitioners in the justice sector to understand the role that **artificial intelligence algorithms** play in the legal system itself. For instance, judges may employ machine learning to improve searches of judicial precedents, while algorithm-assisted document production and review are used to identify case-related documents and extract the most relevant information for the parties’ claims

⁽¹⁾ **El-Hasawy, Marwa El-Sayed El-Sayed.** 2024. “Digital Advocacy in the Era of Electronic Litigation: A Comparative Study.” *Journal of Jil Comparative Studies* 8, no. 20 (September):p. 31–. Lebanon: Jil Center for Scientific Research.

⁽²⁾ **Delacroix S,** ‘Computer Systems Fit for the Legal Profession?’ (2018) *Legal Ethics*, doi:10.1080/1460728x.2018.1551702, www.lawsociety.org.uk. See more., **Songül Tolan**, Fair and Unbiased Algorithmic Decision Making: Current State and Future Challenges, European Commission, Joint Research Centre, December 2018, At, <https://arxiv.org/ftp/arxiv/papers/1901/1901.04730.pdf>, last visited, 14-9-2025.

⁽³⁾ **Amankwaa AO and McCartney C,** ‘The UK National DNA Database: Implementation of the Protection of Freedoms Act 2012’(2018) 284 *Forensic Science International* 117. www.lawsociety.org.uk. , last visited, 14-9-2025.

⁽⁴⁾ **Per Aarvik:** Artificial Intelligence - a promising anti-corruption tool in development settings? U4 Report 2019, p. 28. last visited, 14-9-2025. <https://www.u4.no/publications/artificial-intelligence-a-promising-anti-corruption-tool-in-development-settings.pdf>

⁽⁵⁾ **Veale M, et al,** ‘Fairness and Accountability Design Needs for Algorithmic Support in High-Stakes Public Sector Decision-Making’ in *Proceedings of the ACM Conference on Human Factors in Computing Systems, CHI 2018* (ACM Press 2018), 7, p.4. doi: 10/ct4s. See more., Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation). ELI: <http://data.europa.eu/eli/reg/2016/679/oj> (last visited 8/10/2025).

without the need to manually review every document. Justice institutions also rely on such tools to analyze digital documents, emails, and databases before trial sessions—an approach commonly referred to as **e-discovery**⁽¹⁾.

The field still holds potential for further development in the role of artificial intelligence algorithms within justice systems in general⁽²⁾, and criminal justice in particular. They can be used for various functions such as data storage, managing remote hearings, and employing predictive algorithmic justice across all stages of criminal proceedings. Naturally, this raises considerable debate about the future of certain legal, judicial, and advocacy professions⁽³⁾. However, this study will be limited to examining their role in crime detection and prosecution, in order to facilitate the function of expedited criminal justice.

1/1/1 The Effectiveness of Predictive Analytics Algorithms in Combating Crime

No one can deny the effectiveness of predictive analytics algorithms in combating crime. Without doubt, data and information analysis makes reality an “open book,” through which events can be anticipated. This renders crime prevention significantly easier. Likewise, in the areas of investigation and trial, such analytics prove valuable in establishing criminal liability and adjudicating cases⁽⁴⁾. This is achieved through the following functions:

First: Predicting crime before it occurs

Crimes may be predicted prior to their occurrence by analyzing and studying the number and type of reports filed by complainants or informants. Such analysis enables the tracking of suspects and monitoring of their behavior, placing dangerous individuals and their data under the scrutiny of the relevant authorities. This control allows for preventing them from committing crimes, and in cases where crimes are nevertheless committed, apprehending them becomes much easier.

Undoubtedly, these analytics contribute to the development of advanced software and systems that assist specialized police units in anticipating attacks before they happen. This is achieved by analyzing prior data⁽⁵⁾, creating new attack patterns similar to those previously observed, and thereby enabling protection from both those and future similar patterns⁽⁶⁾.

Through studying and analyzing predictive analytics algorithms, human expertise is preserved by being transferred into smart devices⁽⁷⁾. These devices can also be operated using natural human language, while algorithms contribute to procedural stages in which decisions are made. Because these systems are characterized by objectivity and independence, they have long been regarded as among the most important security mechanisms, preventing crime by means of advanced technologies that enhance efficiency and effectiveness in detecting suspicious activities.

Consequently, decision-makers in security centers may need to consult a predictive dashboard before making decisions⁽⁸⁾. Such an information panel reflects the geographic map within their jurisdiction, displaying percentages that indicate the likelihood of crime in each area. This enables them to manage human resources effectively and deploy them directly to high-risk areas. Modern technologies thus allow for the analysis of past crime data and prediction of probable times and locations for future crimes.

In this way, police can allocate their resources more efficiently and significantly reduce crime rates by covering larger areas with fewer officers.

Some legal experts argue⁽⁹⁾ that it is indeed possible to predict future criminal events and preemptively reduce violent and criminal “hot spots” before crimes take place. For many years, artificial intelligence and machine learning have been employed to establish the identity and location of offenders at the time of committing a crime, as well as their whereabouts before and after the offense. These are often demanding tasks. However, the classification capacities of AI algorithms—processing massive datasets alongside

(1) **Katz D. M., Bommarito, M. J. II, & Blackman, J.** (2017). A general approach for predicting the behavior of the Supreme Court of the United States. *PLoS ONE* 12(4): e0174698. <https://doi.org/10.1371/journal.pone.0174698>

(2) **J. Russell, P. Norvig**, *Artificial Intelligence: A modern approach*, Prentice Hall, 2016, p.40.

(3) **Barak, Ahmed Mohamed.** “The Role of Artificial Intelligence Algorithms in the Criminal Justice System: Prospects and Challenges.” *Journal of Jil In-depth Legal Research*, no. 60 (June 2024): p.36. Lebanon.

(4) **Al-Babli, Ammar Yasser Zuhair**, “The Role of Artificial Intelligence Systems in Predicting Crime.” *Journal of Security and Law*, Dubai Police Academy, vol. 29, no. 1 (January 2021):p. 126.

(5) **J. Russell, P. Norvig**, *Artificial Intelligence: A modern approach*, Op.cit p.41.

(6) **Gorner, J.**, Chicago Police Use ‘Heat List’ to Prevent Violence. *The Chicago Tribune* (2013). Available at: www.policeone.com/chiefs-sheriffs/articles/6403037-Chicago-police-use-heat-list-to-prevent-violence.

(7) **Abdel-Badeeh M. Salem**, *Artificial Intelligence Technology in Intelligent Health Informatics*, Springer, Cham, 2019, p. 21.

(8) **F. Patrick Hubbard**, “Do Androids Dream?”: Personhood and Intelligent Artifacts, 83 *Temp. L. Rev.*, 2011, p. 431.

(9) **Gorner, J.**, Chicago Police Use ‘Heat List’ to Prevent Violence. *The Chicago Tribune Op.cit*.

The Challenges of Artificial Intelligence Applications within the Criminal Justice System – A Comparative Analytical Study

machine learning behavioral models—can mitigate human errors, particularly in witness identification. This, in turn, increases the accuracy of suspect arrests through technical analytics designed for facial recognition and the detection of individuals across multiple locations, whether through closed-circuit television or various other camera systems.

Secondly: Detecting Criminal Activities

Artificial intelligence (AI) systems can significantly assist in identifying and apprehending offenders by rapidly analyzing data, predicting potential suspects, and integrating advanced information technologies. Algorithms can process DNA traces, ballistic evidence, surveillance footage, and even handwriting analysis to support investigations, reduce wrongful arrests, and provide reliable forensic evidence⁽¹⁾.

Despite these advantages, challenges persist regarding bias and fairness⁽²⁾. Predictive policing tools, such as *COMPAS*⁽³⁾, have been criticized for disproportionately labeling African Americans as high-risk compared to white Americans⁽⁴⁾, resulting in longer pre-trial detention and harsher sentencing⁽⁵⁾. Bias has also extended to age and disability. In February 2023, a class-action lawsuit was filed in California against *Workday* for algorithmic discrimination in recruitment, where applicants over 40 years of age and persons with disabilities were systematically rejected. Such practices contravene Title VII of the U.S. Civil Rights Act (1964) and the Americans with Disabilities Act (2008)⁽⁶⁾.

Third: Supporting Investigation and Prosecution

In the field of investigations and prosecution, predictive analytics algorithms play a vital role in processing complex data and extracting critical information. Intelligent systems are capable of handling vast amounts of digital data—such as individuals' personal traits, behavioral tendencies, text messages, phone records, and social media activity—with a speed and accuracy that surpass human capacity. This enables investigators to identify links and relationships between suspects and events, and to uncover hidden evidence that may not be visible to the human eye⁽⁷⁾.

With the advancement of artificial intelligence technologies and the emergence of large language models (LLMs) such as GPT-4, these tools have become increasingly valuable in criminal investigations and crime solving. The analysis of criminal documents through LLMs can provide investigators with significant insights by identifying key information and detecting patterns within texts, such as names, places, dates, and events—thereby enhancing investigative capacity and strengthening the evidentiary process.

1/1/2 The Role of Artificial Intelligence Systems in Investigation Procedures

Digital tools influence the investigation stage by shaping how evidence is collected, analyzed, and how pre-trial decisions are made. Artificial intelligence and big data analytics have become key instruments in investigations, enabling authorities to identify patterns of criminal behavior and to swiftly extract information from massive amounts of data⁽⁸⁾.

For example, machine learning techniques can analyze phone call records, social media activity, and surveillance footage⁽⁹⁾. This allows investigators to create a comprehensive map of relationships between

⁽¹⁾ **Amankwaa A.-O. and McCartney C**, 'The UK National DNA Database: Implementation of the Protection of Freedoms Act 2012, Op.cit.

⁽²⁾ **A Hybrid Machine Learning Approach for DNA Mixture Interpretation** at Syracuse University, NIJ award number 2014-DN-BX-K029.

⁽³⁾ CRIMINAL LAW- SENTENCING GUIDELINES — WISCONSIN SUPREME COURT REQUIRES WARNING BEFORE USE OF ALGORITHMIC RISK ASSESSMENTS IN SENTENCING. — State v. Loomis, 881 N.W.2d 749 (Wis. 2016). HARVARD LAW REVIEW, March 2017, Vol.130, pp.1530-1537.

⁽⁴⁾ **Brennan, Tim, William Dieterich, and Beate Ehret**: Evaluating the Predictive Validity of the COMPAS Risk and Needs Assessment System, Criminal Justice and Behavior, Vol. 36, 1.1,2009, pp. 21–40. On this website; <https://journals.sagepub.com/doi/abs/10.1177/0093854808326545>

⁽⁵⁾ **Corbett -Davies, Sam, Emma Pierson, Avi Feller, Sharad Goel, and Aziz Huq**. "Algorithmic Decision Making. and the Cost of Fairness." ArXiv:1701.08230 [Cs, Stat], January 27, 2017 , Accessed 9/10/2025 On this website; <https://arxiv.org/abs/1701.8230>.

⁽⁶⁾ **ZIAD OBERMEYER, BRIAN POWERS, CHRISTINE VOGELI, AND SENDHIL MULLAINATHAN**: Dissecting racial bias in an algorithm used to manage the health of populations, SCIENCE, Vol 366, Issue 6464, 2019 Accessed 9/10/2025, On this website; <https://science.org/doi/10.1126/science.aax2342>.

⁽⁷⁾ **Al-Babli, Ammar Yasser Zuhair**, op.cit .p.126.

⁽⁸⁾ **Suleiman Al-Anzi**, *Methods of Investigation in Information Systems Crimes* (Master's thesis, Naif Arab University for Security Sciences [NAUSS], Riyadh, Saudi Arabia, 2003),p. 98.

⁽⁹⁾ **Akerkar R.**, "Machine Learning. In: Artificial Intelligence for Business. Springer Briefs in Business".2019 Springer, Cham. **Cristono ALMONTE** vs "AVERNA VISION & ROBOTICS, INC.; united States District Court", W.D. New York., No. 11-CV1088 EAW. 128 F.Supp.3d2015.p.p 729.

suspects and to identify hidden evidence that might otherwise be difficult to detect using traditional methods.

In addition, technology has enhanced digital forensic tools, making it possible to recover deleted data from electronic devices and to analyze suspects' behavior. This increases the authorities' ability to construct a more accurate picture of criminal activities. Facial recognition and image analysis software are also used to match suspects in criminal investigations, which speeds up the identification process⁽¹⁾.

Predictive tools powered by artificial intelligence are also employed to assess the risk of future criminal activity. These systems determine whether suspects should be detained or released on bail, based on analyses of their criminal history, personal data, and past behavior.

On the other hand, deepfake technologies and digitally manipulated content present new challenges in pre-trial investigations. Criminals may use these technologies to falsify evidence, potentially implicating innocent individuals or distorting genuine evidence. This, in turn, creates new challenges for investigators, who must rely on advanced tools to verify the authenticity of digital evidence and distinguish between real and fabricated content. In this context, there is a pressing need for legal and regulatory frameworks that ensure technology is used during investigations in a way that upholds justice without undermining fundamental rights⁽²⁾.

Modern investigative tools that have become integral to criminal investigations include drones, 3D scanners, and specialized crime scene analysis software. Each of these plays a pivotal role in advancing the criminal justice system⁽³⁾.

The use of drones has become increasingly common in criminal investigations, as they allow investigators to capture precise aerial images of crime scenes without needing to be physically present. This helps reduce the risks of tampering with or losing evidence. Drones also provide a new perspective, offering views of the scene from different angles. This is particularly vital when dealing with crimes that occur in large areas or in places that are difficult to access, such as remote locations or major traffic accident sites. By capturing high-quality aerial imagery, investigators can accurately analyze crime scenes and detect patterns or evidence that might not be visible to the naked eye from ground level.

Chapter Two: Safeguards in the Use of Artificial Intelligence Technologies in Criminal Procedures

Since criminal procedure is the essential mechanism for applying criminal law and transforming it from a state of dormancy to one of activity, procedural law defines the methods and mechanisms of evidence gathering and prosecution⁽⁴⁾ while at the same time guaranteeing the accused the opportunity to defend themselves⁽⁵⁾.

All of this must operate through mechanisms aligned with today's technological advancements⁽⁶⁾. The right to a fair trial is thus a procedural safeguard aimed at achieving justice, which requires that judgments be based on factual accuracy and the proper application of the law. This chapter will address the issue through the following two sections:

2.1 Pre-Trial Stage

The use of technology in criminal justice has become increasingly widespread, particularly at the pre-investigation stage. This includes surveillance⁽⁷⁾, wiretapping, the collection of preliminary evidence, and data analysis to identify suspects.

⁽¹⁾ **Mohamed Jibreel Ibrahim**, *Digital Transformation from the Perspective of Criminal Law*, op.cit. p.62. and, **Ryan Kennedy, Lydia Tiede, Amanda Austin, Umamah Bakhsh, and Abdullah Siddiqui**, "Law Enforcement and Legal Professionals' Trust in Algorithms," *Digital Society*, February 2025, On this website <https://journals.sagepub.com/doi/full/10.1177/2755323X251325594>.

⁽²⁾ **Drim, Fatima Zahra**: the role of artificial intelligence in eliminating economic cybercrime: judicial and ethical issues, *International Journal of Social Communication*, 2021. Vol. 8, Issue 1, pp.119-134, page 120.

⁽³⁾ **Ganascia, Gabriel**, *Artificial Intelligence: Between Myth and Reality*. UNESCO Publishing. Available at; <https://bit.ly/39Lcw0S>

⁽⁴⁾ "Smart Justice? Making Sense of the Rise of Algorithm-Based Pre-trial Risk Assessment in Criminal Justice Through 'Legal Models'," *Digital Society*, 2025, On this website <https://link.springer.com/article/10.1007/s44206-025-00194-7>.

⁽⁵⁾ Giovanni Sartor and Monica Palmirani, "Artificial Intelligence in the Judiciary: A Critical View," *Futures* 154 (2024): 103371 On this website, <https://www.sciencedirect.com/science/article/abs/pii/S0016328724001770>

⁽⁶⁾ **Marwa El-Hasawy**, "Challenges of Using Artificial Intelligence in the Preliminary Investigation Stage: A Comparative Study," *Police Thought Journal* 32, no. 126 (July 2023): p.125ff (Sharjah, United Arab Emirates).

⁽⁷⁾ **Caleb Watney**, "When It Comes to Criminal Justice AI, We Need Transparency and Accountability," *R Street Institute*, July 2021, On this website <https://www.rstreet.org/commentary/when-it-comes-to-criminal-justice-ai-we-need-transparency-and-accountability/>

Although these tools play an important role in enhancing security efficiency⁽¹⁾, they also raise serious concerns regarding privacy violations, digital bias, lack of legal accountability, and misuse of data⁽²⁾. The unchecked expansion of such technologies, without strict procedural safeguards and judicial oversight, could undermine fundamental rights such as the right to privacy, freedom of expression, and the right to a fair trial.

Accordingly, there is a pressing need to review laws and policies to ensure a balance between security and the protection of individual freedoms⁽³⁾. This will be explored through three sections: the first will address the safeguard of the right to a fair trial; the second will examine the potential risks arising from the use of AI technologies within the criminal justice system; and the third will present in detail the role of AI systems during trial proceedings and the position of legislation on this matter⁽⁴⁾.

2/1/1 The Guarantee of the Right to a Fair Trial

International instruments affirm every individual's right to a fair trial, including the presumption of innocence until proven guilty, timely notification of charges in a language understood, and the right to examine witnesses and present defense evidence under equal conditions.

However, the growing reliance on artificial intelligence (AI) in judicial decisions raises concerns about fairness guarantees, particularly due to algorithmic biases. Practical evidence, such as the Virginia experiment, showed that while algorithms increased pre-trial releases, they did not raise rates of court evasion—highlighting both opportunities and risks⁽⁵⁾.

These concerns directly affect the safeguards in **Article 6 of the European Convention on Human Rights** and **Article 47 of the EU Charter of Fundamental Rights**, which enshrine fair trial rights, equality before the law, and effective participation in proceedings⁽⁶⁾.

Ultimately, existing data protection regimes are insufficient to address the human rights challenges posed by AI. Fundamental rights most at risk include: the right to a fair trial, due process, privacy and data protection, freedom of expression, equality and non-discrimination, as well as access to social and public services. Since fundamental freedoms are interlinked, the expansion of AI algorithms in legal systems may disrupt the constitutional understanding of human rights.

2/1/2 The Risks of Employing Artificial Intelligence Technologies within the Criminal Justice System

The recourse to using artificial intelligence within the criminal justice system may have significant implications for human rights, as the inaccuracy of such technologies may conflict with the principles of fair criminal justice and the rule of law. Among the potential risks associated with the increasing adoption of AI across the justice system—and its impact on the delivery of justice—are issues related to professional ethics, judicial decision-making, and human rights.

In this context, the European Ethical Charter on the use of artificial intelligence in judicial systems, adopted by the European Commission for the Efficiency of Justice (CEPEJ) under the Council of Europe in 2017⁽⁷⁾, sets out a series of ethical standards and guidelines to be followed when AI is employed in judicial institutions. These include:

⁽¹⁾ **Jorge Marín-Sáez and Alberto Huertas Celdrán**, “Artificial Intelligence in the Criminal Justice System: Exploring Risks and Opportunities Through the Lens of the European Union’s AI Act,” in *Computational AI and Law in European and International Context*, 77–94 (Springer, 2022), On this website https://link.springer.com/chapter/10.1007/978-3-031-86813-9_7.

⁽²⁾ **Sophie Noiret, Jennifer Lumetzberger, and Martin Kampel**, “Bias and Fairness in Computer Vision Applications of the Criminal Justice System,” *arXiv preprint*, August 2022, On this website <https://arxiv.org/abs/2208.03209>.

⁽³⁾ **Cynthia Rudin, Caroline Wang, and Beau Coker**, “The Age of Secrecy and Unfairness in Recidivism Prediction,” *arXiv preprint*, November 2018, On this website <https://arxiv.org/abs/1811.00731>.

⁽⁴⁾ **Richard Berk, Hoda Heidari, Shahin Jabbari, Michael Kearns, and Aaron Roth**, “Fairness in Criminal Justice Risk Assessments: The State of the Art,” *arXiv preprint*, March 2017 On this website, <https://arxiv.org/abs/1703.09207>.

⁽⁵⁾ **Ephraim Nissan**, *Digital technologies and artificial intelligence’s present and foreseeable impact on lawyering, judging, policing and law enforcement*. Springer-Verlag London 2015. p.441/5.

⁽⁶⁾ **Alexandra Chouldechova**: Fair prediction with disparate impact: A study of bias in recidivism prediction instruments, On this website https://www.andrew.cmu.edu/user/achoulde/files/disperate_impact.pdf.

⁽⁷⁾ (European Ethical Charter on the Use of AI in Judicial Systems – CEPEJ, Council of Europe, 2018): “The use of artificial intelligence in judicial systems and their environment must ensure respect for fundamental rights, non-discrimination, quality and security, transparency, impartiality and fairness.” Council of Europe, European Commission for the Efficiency of Justice (CEPEJ). *European Ethical Charter on the Use of Artificial Intelligence (AI) in Judicial Systems and Their Environment*. Strasbourg: Council of Europe, 2018. Available at: <https://www.coe.int/en/web/cepej/ethical-charter-on-ai>

- **Respect for fundamental rights:** Ensuring the right to a fair trial within a reasonable time, and aligning AI-based tools and services with fundamental human rights, such as the right to a fair hearing⁽¹⁾.
- **Confidentiality and privacy:** The use of AI in dispute resolution must safeguard the privacy of data and information introduced through modern technologies. Data submitted by litigants and processed electronically for judicial decisions must remain secure, confidential, and immutable, protected from unauthorized alteration through technological safeguards⁽²⁾.
- **Transparency and comprehensibility:** The electronic processing of case facts and data through AI must be conducted in a precise and understandable manner, ensuring that information and data remain accessible to society as a whole, thereby guaranteeing transparency, impartiality, and fairness⁽³⁾.
- **Equality and non-discrimination:** All individuals must be treated equally before arbitration or courts, with no unjust discrimination based on political, ethnic, religious, social, or other grounds, thus preserving the principle of equality before the law.

2/2 Post-Trial Stage (Sentence Enforcement Stage)

As is well known, punishment aims to achieve three objectives: general deterrence, special deterrence, and the realization of justice. In order for punishment to fulfill its ultimate purpose in combating crime in line with the interests of society, it is necessary to combine these three objectives. The swiftness of procedures serves the interests of society in two ways: first, by ensuring the effectiveness of punishment in fulfilling its aims; and second, by safeguarding society's interest in uncovering the truth and ensuring the proper administration of justice. With respect to deterrence, both general and specific, these are realized once the offender refrains from reoffending. Accordingly, imposing a penalty on the offender—without excessive severity—remains the most effective means of combating crime.

Technology also plays an increasingly significant role in the enforcement of criminal penalties, whether through digital surveillance, the use of artificial intelligence in risk assessment, or virtual rehabilitation programs. This development seeks to make sanctions more efficient, enforceable, and cost-effective compared to traditional punishments such as long-term imprisonment.

Nevertheless, these new tools raise serious concerns regarding violations of fundamental rights. The enhancement of mass surveillance and the imposition of disproportionate sanctions may result in permanent restrictions on individuals' lives, even after they have served their sentences. A brief overview of these tools is presented below:

First: Electronic Monitoring⁽⁴⁾

One of the most significant changes in the enforcement of penalties is the replacement of traditional imprisonment with digital monitoring, which includes electronic bracelets, GPS-based location tracking, and monitoring of offenders' behavior through biometric data. These tools are promoted as more humane alternatives to traditional punishments, as they allow offenders to serve their sentences outside prison, thereby reducing overcrowding in correctional institutions and saving governments enormous financial resources previously spent on prisons.

However, despite these advantages, digital monitoring raises serious concerns regarding the right to privacy⁽⁵⁾, freedom of movement, and the possibility of reintegrating offenders into society. Imposing strict restrictions on individuals' movements and continuously recording their whereabouts can violate their personal lives and expose them to social stigmatization, where they may be perceived as criminals even after completing their sentences⁽⁶⁾.

⁽¹⁾ Mohamed Gamil Zakaria, "AI Applications in the Criminal Justice System: The Next Logical Step or Violation of Human Rights," *Journal of Law and Emerging Technologies*, 2023, <https://jolets.org/ojs/index.php/jolets/article/view/124>.

⁽²⁾ Karen Yeung, "Criminal Justice, Artificial Intelligence Systems, and Human Rights," *ERA Forum* 20, no. 4 (2020): 567–583, <https://doi.org/10.1007/s12027-020-00602-0>.

⁽³⁾ Maria Bergström, "The Use of AI in Criminal Justice: Unpacking the EU's Human-Centric AI Strategy," *Nordic Journal of European Law* 8, no. 1 (2025): 45–62, <https://journals.lub.lu.se/njel/article/view/27594>.

⁽⁴⁾ Anthea HUCKLESBY and Ella HOLDSWORTH, "Electronic Monitoring in England and Wales," University of Leeds, May 2016, p. 5, <http://28uzqb445tcn4c24862ahmel.wpengine.netdnacloud.com/files/2016/06/EMEU-EMEUElectronic-monitoring-in-England-and-Wales.pdf>

⁽⁵⁾ Section 148, subsection 2(b) of the Criminal Justice Act 2003.

⁽⁶⁾ The Legal Aid, Sentencing and Punishment of Offenders Act 2012. http://www.legislation.gov.uk/ukpga/2012/10/pdfs/ukpga_20120010_en.pdf

Moreover, the growing reliance on artificial intelligence systems to analyze offenders' behavior may lead to the imposition of unjustified additional measures. This includes extending monitoring periods based on the "likelihood" of committing a future crime⁽¹⁾, which threatens the principle of time-limited punishment and risks placing individuals under perpetual surveillance⁽²⁾.

Second: Risk Assessment through Artificial Intelligence

Some judicial systems have begun to use artificial intelligence to assess the level of risk posed by convicted individuals and the likelihood of their reoffending. These systems analyze personal data, criminal records, and past behaviors. The resulting assessments are then used to make decisions regarding eligibility for parole or to determine the appropriate level of supervision during the execution of the sentence⁽³⁾.

While such technologies may enhance the efficiency of the penal enforcement system, they also raise serious concerns about discrimination and algorithmic bias. These tools sometimes rely on historical data that may be unfair or unbalanced, which can result in certain individuals being classified as more dangerous based on their social or ethnic backgrounds rather than on genuine legal evidence.

Furthermore, the lack of transparency in how these algorithms operate makes it difficult for affected individuals to challenge the decisions issued against them. For example, an AI system may determine that a particular inmate poses a "high risk" based on mathematical models, without the inmate or their lawyer being able to understand the grounds on which this assessment was made. This constitutes a violation of the principle of a fair trial and undermines the right of individuals to defend themselves against decisions that may have a profound impact on their lives.

Third: Digital Sanctions – Expanding Beyond the Traditional Framework

Digital sanctions represent a shift away from the traditional scope of punishment by incorporating technological tools that extend beyond imprisonment or physical restrictions. These measures may include online restrictions, digital bans, limitations on the use of certain platforms, or participation in mandatory virtual rehabilitation programs. Such sanctions are often justified as modern and cost-effective alternatives that aim to reduce recidivism and facilitate offenders' reintegration into society.

However, expanding punishment into the digital sphere also raises critical legal and ethical concerns. Imposing restrictions on individuals' access to digital spaces—which have become essential for work, education, and social life can amount to a form of social exclusion that persists even after the formal sentence has ended. This risks creating a "digital stigma"⁽⁴⁾ that hinders offenders from fully resuming their roles as active members of society.

Fourth: Virtual Rehabilitation

One of the more recent developments in the enforcement of penalties is the use of digital rehabilitation programs, which may include online psychotherapy sessions, virtual training courses, or digital reintegration initiatives designed to help offenders reintegrate into society. However, reliance on these technologies without sufficient human supervision may prove ineffective.

Technology cannot substitute for the human interaction that is essential to the rehabilitation of individuals. Moreover, such programs may function as an additional tool of indirect surveillance, as offenders are often required to submit periodic reports, undergo digital psychological assessments, or use monitoring applications to analyze their behavior. This raises questions regarding the voluntariness of participation in these programs and whether they are being employed as indirect forms of punishment under the guise of rehabilitation.

Fifth: Electronic Bracelets in the Enforcement of Sentences

Placing offenders under electronic monitoring is one of the most innovative methods of enforcing short-term custodial sentences outside prison walls. This approach allows the convicted person to remain at home while their movements are restricted and monitored through a device resembling a watch or bracelet, attached to the wrist or ankle—hence the name *electronic bracelet*. The electronic bracelet functions in three main forms of custodial enforcement:

(1) **Anthea HUCKLESBY**, « vehicles of desistance? The impact of electronically monitored curfew order », *Criminology and Criminal Justice*, Volume 8(1), Sage, Los Angeles, London, New Delhi and Singapore, 2008,p.51.

(2) Section 148, subsection 2(b) of the criminal Justice Act 2003.

(3) **JAD BROSSOLET**, Caroline jaely, **DANIELLE LAETITA**, Responsabilité civile etintelligence artificielle. Université Paris DESCARTES. Faculté de droit d'économie et degestion Atelier clinique juridique. Juin 2019. P1.

(4) **Dennis J. Baker and Paul H. Robinson**, Artificial Intelligence and the Law, Cybercrime and Criminal Liability, by Routledge, 52 Vanderbilt Avenue, New York, NY 10017 First published 2021.p.piv (5/281).

- **First form: Continuous transmission.** This method, adopted by most countries that implement electronic monitoring, involves the bracelet sending specific signals every 15 seconds to a receiver connected to the telephone line at the offender's residence. The receiver automatically transmits the signals to a central information system equipped with technologies that record this data, which is monitored by the relevant supervisory authority.
- **Second form: Precise verification.** In this method, an automatic telephone call is made to the offender's home or residence. The call must be answered using a voice code or speech recognition system to verify the offender's presence.
- **Third form: Satellite-based electronic monitoring.** This method is applied in the United States and relies on satellite systems to track offenders' movements.

Artificial Intelligence and Correctional Institutions

Artificial intelligence technologies can perform tasks such as evaluating prisoners in correctional facilities and assessing their cases based on reports entered into the system. These systems analyze the data to reach results claimed to be neutral and transparent, particularly regarding parole decisions or the continuation of sentences.

In addition, what has been termed the *next generation of prisoner restraints* has emerged. A U.S. company has developed innovative restraints designed to control high-risk inmates through the use of **electric shocks**. The metallic restraint is equipped with sensors capable of detecting any misuse or tampering by the prisoner, as well as any attempt to escape a designated area. The device then automatically delivers a disabling electric shock. These sensors can also detect whether the prisoner suffers from conditions such as heart disease, allowing the level of the electric shock to be adjusted accordingly.

Another feature of this device is a **drug-injection system**, which—according to the patent—can administer medication to the prisoner through the skin, either by means of a movable needle or a gas-injection mechanism. The advantages of such restraints include reducing the chances of escape and enhancing the safety of both prisoners and correctional staff.

Conclusion

This study has highlighted the profound transformations brought about by technology and artificial intelligence across all stages of criminal justice—beginning with the investigative phase, through the guarantees of a fair trial, and culminating in the enforcement of sentences. It has become evident that technology is no longer a mere auxiliary tool but rather a central actor reshaping the very concept and institutions of criminal justice. While these tools provide enormous potential for enhancing efficiency, reducing costs, and accelerating procedures, they simultaneously pose serious challenges concerning fundamental rights and the protection of human dignity.

Findings:

- **During the investigative stage:** Artificial intelligence has enabled new capabilities in data analysis and evidence extraction, yet it raises concerns regarding the legality of digital data collection and the neutrality of algorithms.
- **During trial proceedings:** The principles of a fair trial are at risk if AI-based judicial assessments lack transparency, thereby restricting the right to defense and weakening human oversight.
- **In the post-trial stage:** The philosophy of punishment has shifted to combine deterrence with digital management of behavior, resulting in an unprecedented expansion of monitoring and control tools.
- **Electronic monitoring and bracelets:** These alternatives to traditional imprisonment reduce overcrowding and state expenditure but impose restrictions that may undermine fundamental freedoms and privacy.
- **AI-based risk assessment:** While efficient, algorithmic bias threatens to entrench discrimination on the basis of social or ethnic background rather than objective legal grounds.
- **Digital sanctions and virtual rehabilitation programs:** Although presented as flexible alternatives to traditional punishments, they risk becoming indirect punitive measures under the guise of reintegration.
- **Technological innovations in correctional institutions (such as shock-equipped restraints):** These reflect a trend toward intensified technical control over inmates, raising questions about the humanity and legality of such practices.
- **Balancing efficiency and rights:** The central challenge remains achieving equilibrium between the advantages of technology and the safeguarding of fundamental rights.

Recommendations

- Establish clear national and international legal frameworks defining the scope and limits of technology in all stages of criminal justice.
- Strengthen **transparency** in AI-based systems and guarantee individuals' right to challenge and judicially review algorithmic decisions.
- Ensure **mandatory human oversight** at every stage—investigation, trial, and enforcement—to prevent justice from becoming an entirely automated process.
- Integrate digital rehabilitation programs with direct human interaction to preserve the essential human dimension of reform.
- Prohibit the use of technologies that violate human dignity (e.g., electric shocks or forced drug injections), regardless of security justifications.
- Adopt **international standards** for the ethical use of technology in criminal justice, with a focus on privacy and individual freedoms.
- Promote **comparative studies** and exchange of experiences among states to identify best practices and maintain a balance between technological efficiency and justice guarantees.
- Invest in **judicial and law enforcement training** to equip practitioners with the knowledge and awareness needed to use technological tools without compromising fundamental legal principles.

Bibliography

1-Arabic References

- **Al-Babli, Ammar Yasser Zuhair.** "The Role of Artificial Intelligence Systems in Predicting Crime." *Journal of Security and Law*, Dubai Police Academy, vol. 29, no. 1 (January 2021).
- Al-Anzi, Suleiman.** *Methods of Investigation in Information Systems Crimes*. Master's thesis, Naif Arab University for Security Sciences (NAUSS), Riyadh, Saudi Arabia, 2003.
- Abdel-Badeeh M. Salem,** *Artificial Intelligence Technology in Intelligent Health Informatics*, Springer, Cham, 2019.
- Barak, Ahmed Mohamed.** "The Role of Artificial Intelligence Algorithms in the Criminal Justice System: Prospects and Challenges." *Journal of Jil In-depth Legal Research*, no. 60 (June 2024). Lebanon.
- Drim, Fatima Zahra :** the role of artificial intelligence in eliminating economic cybercrime: judicial and ethical issues, *International Journal of Social Communication*, 2021. Vol. 8, Issue 1.
- El-Hasawy, Marwa El-Sayed El-Sayed.** 2024. "Digital Advocacy in the Era of Electronic Litigation: A Comparative Study." *Journal of Jil Comparative Studies* 8, no. 20 (September): 31–. Lebanon: Jil Center for Scientific Research.
- El-Hasawy, Marwa.** "Challenges of Using Artificial Intelligence in the Preliminary Investigation Stage: A Comparative Study." *Police Thought Journal* 32, no. 126 (July 2023). Sharjah, United Arab Emirates.
- Ibrahim, Mohamed Jibreel.** *Digital Transformation from the Perspective of Criminal Law: An Analytical Study*. Cairo: Dar Al-Nahda Al-Arabia, 2022.
- Zakaria, Mohamed Gamil.** "AI Applications in the Criminal Justice System: The Next Logical Step or Violation of Human Rights." *Journal of Law and Emerging Technologies*, 2023. <https://jolets.org/ojs/index.php/jolets/article/view/124>.

2-English References:

- Amankwaa AO and McCartney C,** 'The UK National DNA Database: Implementation of the Protection of Freedoms Act 2012' (2018) 284 *Forensic Science International* 117. www.lawsociety.org.uk
- **Berk, Richard, Hoda Heidari, Shahin Jabbari,** Michael Kearns, and Aaron Roth. "Fairness in Criminal Justice Risk Assessments: The State of the Art." *arXiv preprint*, March 2017. <https://arxiv.org/abs/1703.09207>.
- Bergström, Maria.** "The Use of AI in Criminal Justice: Unpacking the EU's Human-Centric AI Strategy." *Nordic Journal of European Law* 8, no. 1 (2025): 45–62. <https://journals.lub.lu.se/njel/article/view/27594>
- **Brennan, Tim, William Dieterich, and Beate Ehret** 'Evaluating the Predictive Validity of the COMPAS Risk and Needs Assessment System, *Criminal Justice and Behavior*, Vol. 36, 1.1, 2009, pp. 21–40. On this website; <https://journals.sagepub.com/doi/abs/10.1177/0093854808326545>
- **Corbett -Davies, Sam, Emma Pierson, Avi Feller, Sharad Goel, and Aziz Huq.** "Algorithmic Decision Making. and the Cost of Fairness." *ArXiv:1701.08230 [Cs, Stat]*, January 27, 2017 , Accessed 9/10/2025 On this website; <https://arxiv.org/abs/1701.8230>.

- Council of Europe, European Commission for the Efficiency of Justice (CEPEJ). *European Ethical Charter on the Use of Artificial Intelligence (AI) in Judicial Systems and Their Environment*. Strasbourg: Council of Europe, 2018. <https://www.coe.int/en/web/cepej/ethical-charter-on-ai>.
- Delacroix S**, ‘Computer Systems Fit for the Legal Profession?’ (2018) Legal Ethics, doi:10.1080/1460728x.2018.1551702, www.lawsociety.org.uk.
- Dorota Jelonek Agata Mesjasz-Lech Cezary Stepniak Tomasz Turek Leszek Ziora**, *The Artificial Intelligence Application in the Management of Contemporary Organization: Theoretical Assumptions, Current Practices and Research Review*, Springer, Cham, 2019.
- Ganascia, Gabriel**, *Artificial Intelligence: Between Myth and Reality*. UNESCO Publishing. Available at; <https://bit.ly/39Lcw0S>
- **Kennedy, Ryan, Lydia Tiede, Amanda Austin, Umamah Bakhsh, and Abdullah Siddiqui**. “Law Enforcement and Legal Professionals’ Trust in Algorithms.” *Digital Society*, February 2025. <https://journals.sagepub.com/doi/full/10.1177/2755323X251325594>.
- **Songül Tolan**, Fair and Unbiased Algorithmic Decision Making: Current State and Future Challenges, European Commission, Joint Research Centre, December 2018, At, <https://arxiv.org/ftp/arxiv/papers/1901/1901.04730.pdf>
- **Rudin, Cynthia, Caroline Wang, and Beau Coker**. “The Age of Secrecy and Unfairness in Recidivism Prediction.” *arXiv preprint*, November 2018. <https://arxiv.org/abs/1811.00731>.
- J. Russell, P. Norvig**, *Artificial Intelligence: A modern approach*, Prentice Hall, 2016.
- **Jorge Marín-Sáez and Alberto Huertas Celdrán**, “Artificial Intelligence in the Criminal Justice System: Exploring Risks and Opportunities Through the Lens of the European Union’s AI Act,” in *Computational AI and Law in European and International Context*, 77–94 (Springer, 2022), On this website https://link.springer.com/chapter/10.1007/978-3-031-86813-9_7.
- Katz D. M., Bommarito, M. J. II, & Blackman, J.** (2017). A general approach for predicting the behavior of the Supreme Court of the United States. *PLoS ONE* 12(4): e0174698. <https://doi.org/10.1371/journal.pone.0174698>
- **Marín-Sáez, Jorge, and Alberto Huertas Celdrán**. “Artificial Intelligence in the Criminal Justice System: Exploring Risks and Opportunities Through the Lens of the European Union’s AI Act.” In *Computational AI and Law in European and International Context*, 77–94. Springer, 2022. https://link.springer.com/chapter/10.1007/978-3-031-86813-9_7.
- **Noiret, Sophie, Jennifer Lumetzberger, and Martin Kampel**. “Bias and Fairness in Computer Vision Applications of the Criminal Justice System.” *arXiv preprint*, August 2022. <https://arxiv.org/abs/2208.03209>.
- “Smart Justice? Making Sense of the Rise of Algorithm-Based Pre-trial Risk Assessment in Criminal Justice Through ‘Legal Models’.” *Digital Society*, 2025. <https://link.springer.com/article/10.1007/s44206-025-00194-7>.
- **Sartor, Giovanni, and Monica Palmirani**. “Artificial Intelligence in the Judiciary: A Critical View.” *Futures* 154 (2024): 103371. <https://www.sciencedirect.com/science/article/abs/pii/S0016328724001770>.
- **Per Aarvik**: Artificial Intelligence - a promising anti-corruption tool in development settings? U4 Report 2019, p. 28. last visited, 14-9-2025. <https://www.u4.no/publications/artificial-intelligence-a-promising-anti-corruption-tool-in-development-settings.pdf>
- Veale M, et, al**, ‘Fairness and Accountability Design Needs for Algorithmic Support in High-Stakes Public Sector Decision-Making’ in *Proceedings of the ACM Conference on Human Factors in Computing Systems, CHI 2018* (ACM Press 2018), 7,. doi: 10/ct4s.
- **Watney, Caleb**. “When It Comes to Criminal Justice AI, We Need Transparency and Accountability.” *R Street Institute*, July 2021. <https://www.rstreet.org/commentary/when-it-comes-to-criminal-justice-ai-we-need-transparency-and-accountability/>
- Yeung, Karen**. "Criminal Justice, Artificial Intelligence Systems, and Human Rights." *ERA Forum* 20, no. 4 (2020): 567–583. <https://doi.org/10.1007/s12027-020-00602-0>.
- ZIAD OBERMEYER, BRIAN POWERS, CHRISTINE VOGELI, AND SENDHIL MULLAINATHAN**: Dissecting racial bias in an algorithm used to manage the health of populations, *SCIENCE*, Vol 366, Issue 6464, 2019 Accessed 9/10/2025, On this website; <https://science.org/doi/10.1126/science.aax2342>