RESEARCH ARTICLE

JENER Journal of Empirical and Non-Empirical Research
Volume 2, Issue 5, Page 319-320 | Article No. 34
DOI: 10.4898/jener.v2i5.a34
ISSN: 7895-9216
Journal homepage: https://jenerjournal.com
Journal email: editor@jenerjournal.com

JENER Journal
JENER Journal of Empirical and Non-Empirical Research

AI-Based Security Systems and Digital Justice: Ethical Risks and Governance Frameworks

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ARTICLE INFORMATION

Article history:
Published: May 2026

Keywords:
Artificial Intelligence, Digital Justice, Algorithmic Bias, Cybersecurity, Ethical AI, Explainable AI, Surveillance Systems

ABSTRACT

The rapid deployment of Artificial Intelligence (AI) in security systems has significantly transformed modern surveillance, cybersecurity, and threat detection mechanisms. While AI-driven security infrastructures improve efficiency and real-time decision-making, they also introduce critical concerns regarding digital justice, algorithmic bias, transparency, and accountability. This paper explores the ethical implications of AI-based security systems with a specific focus on fairness in automated decision-making processes. Key domains such as facial recognition, predictive policing, and cybersecurity analytics are analyzed to identify potential risks of discrimination and data bias. Furthermore, the study proposes a governance framework incorporating Explainable AI (XAI), human-in-the-loop mechanisms, and ethical data governance strategies to enhance fairness and reliability in AI-enabled security environments.

1. Introduction

Artificial Intelligence (AI) has become a core component of modern security infrastructures, enabling advanced capabilities in surveillance, cyber defense, and predictive analytics. Governments and organizations increasingly rely on AI-based systems for real-time threat detection and decision-making. However, the integration of AI into security frameworks raises significant ethical and societal concerns.

One of the most critical issues is digital justice, which refers to fairness, transparency, and accountability in algorithm-driven systems. AI systems operate based on large datasets that may reflect historical inequalities or biased human decisions. Consequently, these systems may unintentionally reinforce discrimination, particularly in sensitive applications such as facial recognition, predictive policing, and behavioral monitoring.

This paper aims to analyze the ethical risks associated with AI-based security systems and propose a governance framework to ensure fairness and accountability.

2. Related Work

Recent studies highlight that AI systems are not inherently neutral. According to multiple researchers in AI ethics, algorithmic bias often emerges from unbalanced training datasets and poorly designed models. Facial recognition systems, for instance, have shown higher error rates for certain demographic groups, raising concerns about fairness and discrimination.

In cybersecurity, AI-based intrusion detection systems are widely used, but their decision-making processes are often opaque. This lack of transparency limits trust and raises accountability issues. Scholars also emphasize the importance of Explainable AI (XAI) to improve interpretability and reduce ethical risks.

3. Methodology

This study employs a qualitative analytical approach. It synthesizes existing literature in AI ethics, cybersecurity, and digital governance to identify key ethical risks in AI-based security systems. The analysis focuses on three main domains:

- Facial recognition systems
- Predictive policing algorithms
- AI-driven cybersecurity systems

Each domain is evaluated based on fairness, transparency, and potential bias.

4. Ethical Risks in AI-Based Security Systems

4.1 Algorithmic Bias

AI systems often inherit bias from training datasets. If the data is not diverse, the system may produce unfair outcomes, particularly against minority groups. This is a major challenge in facial recognition and surveillance systems.

4.2 Lack of Transparency

Many AI models operate as "black boxes," meaning their decision-making process is not easily interpretable. This creates accountability issues in security applications where decisions can significantly impact individuals' rights.

4.3 Privacy Concerns

AI-based surveillance systems collect massive amounts of personal data. Without proper regulation, this can lead to violations of privacy and misuse of sensitive information.

4.4 Automated Decision Risks
In predictive policing and cybersecurity, AI systems may make autonomous decisions without human oversight, increasing the risk of false positives and unfair targeting.

5. Digital Justice Framework for Ai Security Systems
To address these challenges, this paper proposes a multi-layered governance framework:

5.1 Explainable AI (XAI)
AI models should be designed to provide interpretable outputs, allowing users to understand how decisions are made.

5.2 Human-in-the-Loop Systems
Critical security decisions should involve human supervision to prevent fully automated unjust outcomes.

5.3 Ethical Data Governance
Training datasets must be diverse, balanced, and regularly audited to reduce bias.

5.4 Regulatory Compliance
Governments should implement strict regulations to ensure accountability and ethical use of AI in security systems.

6. Discussion
The integration of AI in security systems presents both opportunities and risks. While AI improves efficiency and threat detection capabilities, it also introduces significant ethical challenges. The concept of digital justice becomes essential in ensuring that technological advancements do not compromise human rights and equality.
A balanced approach combining technological innovation with ethical governance is necessary to ensure responsible AI deployment.

7. Conclusion
AI-based security systems are transforming modern society, but they must be developed and implemented with strong ethical considerations. This study highlights the importance of digital justice in addressing algorithmic bias, lack of transparency, and privacy concerns. The proposed governance framework emphasizes Explainable AI, human oversight, and ethical data management as key solutions for ensuring fairness and accountability.
Future research should focus on developing standardized global policies for ethical AI deployment in security systems.

References
[1] Russell, S., & Norvig, P., Artificial Intelligence: A Modern Approach, Pearson, 2021.
[2] O'Neil, C., Weapons of Math Destruction, Crown Publishing, 2016.
[3] European Commission, "Ethics Guidelines for Trustworthy AI," 2019.
[4] Mehrabi, N., et al., "A Survey on Bias and Fairness in Machine Learning," ACM Computing Surveys, 2021
[5] Goodman, B., & Flaxman, S., "European Union Regulations on Algorithmic Decision-Making," AI Magazine, 2017.