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**Artificial Intelligence in crime prevention and detection: Enhancing predictive policing and public safety**

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**Abstract**

*Artificial Intelligence (AI) is an important factor in improving crime prevention and detection. The systems based on AI process large volumes of data to discover patterns, project possible crimes, and detect abnormalities. AI-driven tools in crime detection can be used in facial recognition, object detection, and predictive policing, and help law enforcement react proactively. The AI does the same on surveillance feeds, suspicious activity, and notifies the authorities. Moreover, chatbots and virtual assistants based on AI can deliver information about the safety of citizens and assist them. Intelligent analytics will also be useful in determining the possible crime hotspots and resource allocation. Through AI, law enforcement agencies will be able to excel in response times and lower crime rates, and boost the safety of the people. The AI technology continues to explore the assisting role in crime to make the communities safer.*

**Keywords:** *challenges, historical context, laws, opportunities, theoretical context*

**Introduction**

Artificial Intelligence (AI) is changing the sphere of crime detection and security and reforming how law enforcement agencies handle crime prevention and investigation (Abouzari, 2022). Using the leverage of advanced algorithms and machine learning styles, the systems run on AI are able to process large volumes of data and detect patterns, and forecast future crimes. It allows the police to be proactive in their action, reducing response time and resource distribution (Samuel, 2023). There are various uses of AI in crime detection, such as predictive policing, facial recognition, and forensic analysis (Lamina et al., 2024).

Data analytics can be used to predict hotspots of crime and possible suspects through predictive policies, and can be used to identify people in crowds quickly through facial recognition technology (Apene et al., 2024). Surveillance systems that are powered by AI will be able to identify suspicious activity, which will cause the authorities to be notified about the possible threats (Kaur & Saini, 2024). AI is also very important in protection, besides crime detection (Dakalbab et al., 2022).

AI-based technologies can improve cybersecurity, identify, and stop cybercrimes that endanger the lives of people (Alshamsi & Safei, 2023). Chatbots and other virtual assistants that run on AI can offer citizens details about their safety and assistance to enhance their relationships with the community and trust (Natarajan et al., 2024). Crime detection and protection using AI have demonstrated some encouraging outcomes, and numerous police departments report having increased efficiency and effectiveness (Abouzari, 2022). Nonetheless, the issue of bias privacy and accountability needs to be taken into consideration so that AI can be utilized responsibly in the field of law enforcement. With the ongoing development of AI technology, its use in crime detection and protection is expected to grow, allowing law enforcement agencies to be ahead of the emergent threats and keep the citizens safe through the use of AI's potential.

### **Research Justification**

The modern world has been engulfed by the implementation of Artificial Intelligence (AI), and the sphere of crime detection and protection is no exception. The study intends to clarify the considerable role of AI in improving crime detection and crime prevention, and response, hence enhancing security and safety for the population. The possibilities of AI as a tool of crime detection are premised on its capacity to handle massive volumes of data effectively and indicate patterns and trends that may be lost in the efforts of human crime investigators.

The sub-field of AI machine learning will be able to identify patterns in crime history, forecast crime-prone areas, and find connections between seemingly unrelated crimes, which can be used to do proactive policing and allocate resources. Besides, AI-based video analytics will enhance surveillance and observation. An example is the use of facial recognition technology to assist law enforcement agencies in identifying suspects, missing individuals, or victims with a higher degree of accuracy and speed. CCTV footage can also be analyzed by AI, and anomalies identified, eliminating the need to spend time on a manual surveillance system and improving response times. The use of AI can help in the investigation of a crime scene, too. Instead of taking a long time to administer traditional methods of analyzing fingerprints, DNA samples, and other evidence, forensic AI tools can process them faster and more accurately, making the justice process fast. AI can also be used to predict recidivism rates, and thus law enforcement agencies can use their resources to be directed towards rehabilitation and reintegration programs of offenders. Nonetheless, AI has not been introduced in crime detection and protection with ease.

A series of problems, including the idea of privacy, ethical challenges, and possible threats to use technology improperly, should be resolved to ensure that AI can be used as a source of justice and not of oppression. To sum up, AI can play an important role in crime detection and protection, which has potential solutions to a more efficient and effective crime prevention and investigation process. It is important, however,

to make sure that the creation and application of AI in this area are informed by ethical principles and efficient governance frameworks to ensure that people do not lose their trust and civil liberties are not violated by its implementation. This study will be an addition to the current discussion on the use of AI in crime detection and protection, offering some insights on its potential advantages and drawbacks, and what recommendations can be made to implement it in the least harmful way possible.

### **Research Objectives**

1. To discuss the historical context of the role of AI in crime detection and prevention.
2. To highlight the theoretical context of the role of AI in crime detection and prevention.
3. To analyze the laws regarding the role of AI in crime detection and prevention.
4. To identify the key challenges regarding the role of AI in crime detection and prevention.
5. To explore the opportunities for the role of AI in crime detection and prevention.
6. To propose effective prevention and intervention strategies.

### **Research Methodology**

This study employed a systematic review methodology, with research objectives established accordingly. A comprehensive literature review was conducted (Komba & Lwoga, 2020). Research findings were categorized based on their content (Hiver et al., 2021; Petticrew & Roberts, 2006), and classified information was incorporated into the study by organizing it into headings (Gan et al., 2021; Pawson et al., 2005). The evaluation of classified information and titles formed the basis of the study (Page, 2021; Rahi, 2017), ensuring the integrity of the research subject and its contents (Egger et al., 2022; Victor, 2008). The criteria for selection are listed.

1. **Relevance:** Researches that directly addressed the questions posed by this study are included.
2. **Quality:** Studies that meet a certain quality threshold (e.g., methodological rigor, bias risk) are included. Most of the research is from Scopus-indexed and Clarivate Analytics journals and reputed publishers.
3. **Recency:** Consideration of the publication date to ensure that the review reflects the most current evidence. Most of the studies are from the last three years.
4. **Language:** Only studies published in English are included.
5. **Data Completeness:** Previous studies must provide sufficient data on outcomes of interest for practical synthesis; this is also ensured in this research.

This study did not use primary data from human participants; therefore, no ethics clearance letter from the ethics committee was required.

### **Literature Review**

The AI is applicable in crime detection and crime prevention using predictive policing, facial recognition, and data analytics, which are useful in proactive intervention and efficient deployment of resources by analyzing huge volumes of data to identify patterns and predict areas of crime (Apene et al., 2024). The AI is useful in investigations as it analyzes huge volumes of data, supports the process of handling cases, and speeds up the suspect-finding process (Sood et al., 2023). There are, however, very serious problems that accompany its implementation, including bias in the algorithms, intrusion of privacy, and absence of transparency and

accountability that necessitate well-established legal and ethical infrastructures to facilitate responsible and just usage (Samuel, 2023).

According to the historical data of crimes, geographic data, and even activity on social media platforms, AI algorithms can estimate potential areas of crime and time for crimes in order to enable law enforcement agencies to manage their resources more effectively and even prevent crimes (Kaur & Saini, 2024). The AI surveillance can be used to compare the live video images with large databases of known criminals and successfully identify suspects in overcrowded areas, which renders them safer (Alshamsi & Safei, 2023). AI provides quality abilities to process sizable data quantities, create sensible conclusions, and in addition find convoluted designs or unusual incidences that a human examiner might disregard and advance criminal inquiries and accelerate the examination of evidence (Lamina et al., 2024). Enhanced Resource with AI, the law enforcement agencies can service their resources effectively and manage their employees by forecasting the trends and the hot spots to improve their efficiency.

The societal bias that was applied in the training data can be replicated when AI models are used, and thus they will produce discriminating outcomes and escalate the already existing stereotypes (Singh & Nambiar, 2024). The broad usage of AI in surveillance, data analytics, and facial recognition raises serious concerns associated with the privacy of an individual and the risk of using their personal information (Natarajan et al., 2024). Many applications of artificial intelligence are black boxes, and one would struggle to conceive how it arrives at its verdict; thus, it will be harder to make it transparent, responsible, and equitable to achieve. The rapid growth of AI in the law enforcement field indicates the urgent need for a comprehensive legal and regulatory framework to control the ethical use of AI, prevent discrimination, and protect human rights (Dakalbab et al., 2022). In conclusion, AI has a powerful crime-detecting and crime-protecting prospect, but such an approach needs to be strictly controlled to prevent all the threats that the sphere poses and introduce strong ethical standards and legal rules to ensure that the high-tech solutions can be applied to deliver justice to the offenders in a fair way.

### **Historical Context of the Role of AI in Crime Detection and Prevention**

The involvement of AI in crime detection and protection has developed over the course of time (Singh & Nambiar, 2024). First, police departments used rudimentary data analysis methods, such as predictive policing, to predict the possible sites and patterns of crime. The initial uses were to improve crime prevention and strategies of investigation (Abouzari, 2022). As machine learning and artificial intelligence advanced, AI started to use the techniques in more advanced applications in crime detection (Natarajan et al., 2024). It involves the application of AI in crime prediction, facial recognition in crimes, and evidence analysis.

Nowadays, AI-based solutions can help police to examine huge amounts of data, locate suspects, and determine crime patterns, supplementing the traditional ways of policing (Sood et al., 2023). Along with its increased use in crime detection, AI poses various concerns, such as the privacy prejudice and transparency of the processes of AI-based decision-making (Lamina et al., 2024). The use of AI and its impacts on society are being debated on and on. The history of AI in crime detection is still impacting the policing practices and approaches, and debates about the need to balance efficiency and ethical issues continue (Kaur & Saini, 2024).

The implementation of AI in both the detection and protection of crimes has taken many forms (Samuel, 2023). To begin with, such methods as predictive policing involve analyzing data to predict the possibility of crime occurrence (Apene et al., 2024). As machine learning improved, AI started to use the methods to predict crimes, recognize faces, and analyze evidence (Dakalbab et al., 2022). Nowadays, AI-based applications can help police to process large volumes of data, find suspects, and project crime hotspots.

### **Theoretical context of Role of AI in Crime Detection and Prevention**

In theory, AI can be used to increase crime detection and protection because of its data analysis, pattern recognition, and predictive capabilities. With an AI system, a lot of data can be processed to establish trends and peculiarities that human analysts are not able to detect. It may result in better investigations and even better accuracy in crime prevention and detection. Theoretical advantages of AI in this field are the increase in the efficiency of data processing, better predictive possibilities of crime prevention, and help in the analysis of evidence in a complicated manner.

The use of such techniques as predictive analytics can be used to predict possible hotspots of crimes, and facial recognition and evidence analysis can assist in the investigation process. Nevertheless, there are also theoretical issues about bias and fairness in the implications of AI systems' privacy because AI is data-driven, and problems with the control to provide transparency and accountability in AI-driven decisions. The balance between the application of AI capabilities in crime detection and the ethical and practical issues of AI use is highlighted in the theoretical context. Proposed advantages are increased effectiveness in data processing. Better predictions in crime prevention. Help with the complicated analysis of evidence. Nonetheless, there are theoretical issues of bias and fairness that AI systems might acquire biases based on the training data. Privacy AI is data-driven and therefore poses privacy concerns. It isn't easy to understand AI-driven decisions and be as transparent and accountable.

### **Laws Regarding the Role of AI in Crime Detection and Prevention**

Legality of AI status is also changing to accommodate issues relating to transparency, accountability, bias, and due process. These are some of the main points that regulatory frameworks propose regarding the AI Act of the European Union, where high-risk AI applications, such as criminal justice applications, are required to be transparent and explainable. Council of Europe framework convention on artificial intelligence and human rights. Efforts to make AI systems observe human rights and dignity. Algorithms based on historical crime data will have the potential to propagate the systemic discrimination of AI systems. Black box AI systems may create challenges in the challenge of evidence by defendants because they are transparent and explainable. Existing liability and accountability fail to assign the blame for harms relating to AI. Responsible AI innovation in law enforcement by UNODC lays emphasis on some risks and opportunities of AI in law enforcement. Leading is the acceleration of AI-enabled crime, such as financial crime and phishing. More broadly, the laws and regulations in the field of AI-enabled crime detection and protection are still in a developing stage.

### **Challenges for the Role of AI in Crime Detection and Prevention**

Artificial Intelligence (AI) has potential in crime detection and protection, but it has a number of challenges. Among them is the bias of data. AI models may reproduce any biases in the training data and give unjust results.

Besides, the quality of the data is paramount because faulty data may lead to wrong findings. The other issue is the concern of privacy. Civil liberties and the privacy of the individual are questionable when AIs are used for surveillance. Moreover, the absence of transparency in the decision-making process of AI may complicate the comprehension of the way of arriving at a conclusion. Social risks such as cybersecurity are also a serious issue, and AI systems may not be capable of withstanding cyber-attacks; in addition that the lack of explicit rules and codes does not help to implement AI in law enforcement effectively. Lastly is an ethical issue of AI in detecting crime and protection that needs to be taken care of. These are issues of surveillance profiling and accountability.

To make sure that AI is used responsibly and efficiently to improve citizens' safety and aid law enforcement agencies, such concerns should be addressed. Through these challenges identification and alleviation, we can use AI to develop safer communities. These issues should be considered to make sure that AI is used effectively and responsibly in protecting and detecting crimes. It involves ensuring different and representative training information, enhancing the use of strong data validation and quality control, creating a set of rules and policies, creating an understandable and explainable AI model, and establishing effective cybersecurity.

### **Opportunities for Role of AI in Crime Detection and Prevention**

The introduction of artificial intelligence (AI) into crime detection and protection has a lot of opportunities. Among the benefits, there is an increased predictive capability. Big data can be sorted and analyzed by AI, which will help anticipate the location of crimes and potential suspects in order to act proactively by law enforcement agencies. Also, AI-enhanced surveillance devices are capable of identifying suspicious activity and sending notifications to the police, which will enhance the reaction to the incident and citizen safety. The allocation of resources can also be enhanced with the assistance of AI, as it can assist law enforcement agencies in allocating resources in a better manner. More so, AI can make forensic analysis more meaningful through its digital forensics and incident response assistance.

AI can identify and remove cybercrimes in the sphere of cybersecurity, ensuring the safety of the population and confidential data. Furthermore, intelligence-led policing approaches could be assisted by AI to allow law enforcement organizations to identify and thwart crimes. Safety information and helping to improve community engagement and trust can also be achieved by AI-powered chatbots to give the citizens the needed information. The police can utilize such opportunities to lower criminal activities and enhance public security, as well as effectiveness. In the end, AI could help transform crime detection and protection to provide safer societies and assist law enforcement agencies in their activities. Such opportunities may reduce the crime rates. AI-driven solutions can be used to prevent crimes and decrease crime rates. Better public safety AI has the potential to increase both community security and trust in the police and law enforcement agencies. Better efficiency AI can improve the efficiency of law enforcement operations, which can be redirected to other, more important work.

### **Discussion**

The application of Artificial Intelligence (AI) in crime detection and protection is versatile and revolutionary. The possibility of processing large volumes of data allows the police to anticipate crime hot zones

and possible suspects and take preemptive actions. Surveillance systems that are controlled by AI will be able to observe suspicious activities and notify the authorities, enhancing response time and the safety of citizens. Also, AI can deepen the digital forensic and incident response capabilities, facilitating the investigation and prosecution. The ability of AI to predict could also be used to guide the allocation of resources to ensure law enforcement agencies allocate resources efficiently.

Additionally, AI is capable of identifying and stopping cybercrimes, ensuring the safety of the population and confidential data. Law enforcers can use the potential of AI to build safer communities, enhance the response to arising threats, and increase the trust between law enforcement and citizens. With the further development of AI technology, its uses in crime detection and protection have the potential to improve, providing new chances to innovate and enhance it.

### **Conclusion**

Artificial intelligence (AI) as a tool of crime detection and protection is a transformational phenomenon that provides law enforcement agencies with a potent means of providing citizens with improved security and lowering crime rates. Using the predictive capabilities of AI surveillance servers and forensic analysis, police can prevent the occurrence of potential threats and increase the speed of response. The capacity of AI to work with large volumes of data and identify patterns facilitates making informed decisions regarding the allocation of resources and crime prevention methods. With the development of AI technology, the potential to support crime detection and protection will experience further evolution and provide new chances for innovations and advancement. Through taking advantage of the benefits of AI and overcoming its drawbacks, the law enforcement organizations can build safer communities, better the levels of trust between the law enforcement and the citizens, and respond more effectively to the emergent threats.

### **Recommendations**

1. Address bias and fairness by putting in place mechanisms of detection and reduction of bias in AI systems that promote fairness and equity in crime detection and protection.
2. Build alignment between law enforcement and AI professionals, prompting law enforcement agencies and AI specialists to work together to create and enhance AI-based crime detection and protection systems.
3. Create an effective framework and build and create clear rules and guidelines for AI applications in crime detection and protection.
4. Implement and develop AI-powered predictive policing. On the one hand, AI algorithms are used to analyze crime data and forecast possible areas of crime and suspects.
5. Improve data sharing and Integration. Standardize the data sharing protocols to facilitate the integration of AI systems across law enforcement agencies.
6. Keep abreast of new AI innovations, constantly watch new AI technologies, and evaluate their possible use in crime detection and protection.
7. Law enforcement Investor incubation in AI Law enforcement Investor incubation in AI Law enforcement Investor incubation in AI Law enforcement Investor incubation in AI Law.

8. Regularly review and assess AI systems. AI systems should be reviewed and evaluated continually to ensure that they are effective and fair, and unbiased.
9. Strengthen surveillance systems, introduce AI-based surveillance systems capable of producing suspicious behavior and reporting the same to the authorities in real-time.
10. Transparency and accountability will make AI systems transparent, explainable, and accountable, and have transparent decision-making processes.

### **Research Limitations**

Artificial intelligence (AI) has a significant role in crime detection and protection, a rapidly developing area, though there is inherent in it a number of limitations. The quality and availability of data are one of the major limitations. To be useful in prediction, AI algorithms demand good quality in a wide variety of relevant data in order to learn. Nevertheless, crime data may be partial biased or inconsistent, which can affect the performance of AI. Also, algorithmic bias may reinforce prevailing social inequalities that cause unfair results. The other weakness is the inability to be transparent and explainable during AI decision-making processes. It may complicate the acquisition of insights into how AI comes to its decisions, which may undermine confidence in AI systems. Moreover, AI systems can be adversely affected by cybersecurity risks, so that their manipulation by malicious actors can take place. Such constraints point to the fact that further research and development are necessary to overcome these obstacles and ensure that AI is utilized in a responsible and efficient manner in criminal detection and protection.

### **Research Implications**

The implication of Artificial Intelligence (AI) in crime detection and protection is an important research implication. The main implication is that there is a necessity for interdisciplinary cooperation of computer science, law enforcement, and social sciences to create successful solutions based on AI power. The researchers should also focus on data quality and integrity, which enables AI systems to be trained using varied and representative data sets to reduce bias and offer fairness. The second implication is that AI systems need to undergo constant analysis and verification, as this will guarantee their precision and efficiency in practice. Other ethical issues that need to be researched include privacy observation and responsibility to ensure that AI is put to ethical use in crime detection and safety. Also, it should be researched further on creating explainable AI, which can offer clear and understandable conclusions that can allow law enforcement agencies to comprehend and place their faith in AI-driven insights. These implications can be solved by researchers and thus help to make the use of AI constructive and accountable in crime detection and protection.

### **Future Research Directions**

The role of AI in crime detection and protection has the possibility of future research directions, including. Enhancing AI-enhanced predictive policing that builds more effective and trustworthy AI models to forecast crime hotspots and potential suspects, whilst dealing with the issue of bias and fairness. Improving digital forensics Digital forensics Digital forensics involves the utilization of AI in digital forensics to analyze large data sets to establish patterns and automation of evidence analysis. Explainable AI is building AI systems that can give transparent and interpretable outcomes that can be understood and relied on by law enforcement



agencies. The ethical concern of the use of AI in detecting and protecting crimes, and the ethical considerations of privacy monitoring and responsibility. Hybrid AI and open source intelligence investigation into the possibilities of integrating AI and open source intelligence to enhance crime detection and investigation. Research on AI-enabled cybersecurity is creating AI-enabled solutions to identify and stop cybercrimes and to improve response to incidents. These areas of study can lead to developing the use of AI in crime detection and protection, as well as making the AI systems fair, transparent, and effective.

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