Chapter 7
Integrating AI Into Restorative Justice and Conflict Resolution

ABSTRACT

In this chapter we see that artificial intelligence (AI) has rapidly evolved into a crucial tool for enhancing various aspects of law enforcement, bringing significant potential to improve efficiency, accuracy, and decision-making processes. Defined by John McCarthy in the 1950s as "the science and engineering of creating intelligent machines," AI encompasses various methods allowing machines to emulate human problem-solving and data analysis capabilities, enabling applications across fields as diverse as healthcare, finance, and criminal justice.

INTRODUCTION

There are two major forms of artificial intelligence: good old-fashioned AI and current AI. It's important to distinguish between these two forms because they employ different methodologies. Good old-fashioned AI, which spanned from the 1950s to the 1990s, was rule-based and utilized languages such as Prolog and Lisp. This era marked the beginning of expert systems. In contrast, current AI relies on machine learning, deep neural networks (also known as deep learning), large language models, and generative AI. The current AI algorithms, which are frequently based on historical data, can unintentionally reinforce biases and social inequalities present in the original datasets. Predictive policing, for instance, may lead to over-policing in certain communities, perpetuating systemic biases if not carefully managed. Concerns around transparency and accountability are also significant, as AI's "black box" nature complicates understanding the decision-making processes

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behind certain outputs. In applications such as loan approvals or sentencing predictions, lack of transparency and traceability can erode public trust and hinder the ability to contest or understand AI-driven outcomes.

In the realm of law enforcement, AI is particularly transformative. Within law enforcement, AI's machine learning algorithms analyze massive datasets to identify patterns, from facial recognition to fraud detection, assisting in crime prevention and enhancing public safety measures. For instance, advancements in facial recognition software aid in accurately identifying individuals in real-time, enabling officers to track suspects or missing people more efficiently. AI-driven image analysis tools surpass human limitations, identifying faces, weapons, and complex events such as accidents or crimes with high precision. Collaborative projects, such as those funded by the National Institute of Justice (NIJ), highlight ongoing research to optimize AI's functionality for identifying individuals across diverse conditions, even with partial or poor-quality images, as seen in partnerships with institutions like Carnegie Mellon University. The development of scene analysis, which provides contextual object and event recognition, further enhances real-time monitoring and investigative capabilities, allowing law enforcement to intervene proactively.

Another promising application is in DNA and forensic analysis. AI has revolutionized DNA identification by enabling the detection of complex DNA mixtures and facilitating reexamination of aged DNA evidence, thus unlocking leads in previously unsolved cases. Additionally, AI's predictive capabilities are employed in gunshot detection and sound analysis, where AI can assess audio characteristics to identify firearms, determine shot frequency, and differentiate between sound sources—providing essential data for law enforcement investigations. AI's anticipatory tools further extend to recidivism prediction, where algorithms analyze vast databases to assess reoffending risks, assisting officers in resource allocation and case prioritization. However, while AI's integration into law enforcement promises efficiency and effectiveness, it also raises ethical concerns.

The ethical challenges in AI use for law enforcement have prompted calls for a multi-dimensional approach, encompassing technical solutions, regulatory oversight, and public education. Techniques like interpretable machine learning, fairness-aware algorithms, and regular audits are essential to address bias, ensure transparency, and maintain accountability. Furthermore, a collaborative approach, involving interdisciplinary research and input from affected communities, can guide the ethical deployment of AI in ways that prioritize societal values and legal compliance.

Ultimately, AI in law enforcement offers transformative potential to improve investigative accuracy, enhance public safety, and optimize resource allocation. Yet, addressing ethical concerns is crucial to ensuring AI's responsible application. By balancing technological innovation with ethical considerations, law enforcement