ALGORITHMIC BIAS IN CRIMINAL JUSTICE: ADDRESSING THE SOCIAL COSTS OF PREDICTIVE POLICING

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ABSTRACT

This article examines whether Racial Discrimination and Bias Algorithm, which exists in Policing Predictive Algorithm (PPA) technology, which has emerged recently in few years, the algorithm is used to predict possible threats and provide solutions to law enforcement. The algorithm analyses historical crime-driven data to predict possible criminal activities and identify the place of crime easily by using this algorithm. Although it provides efficiency and resource optimization in crime prevention However, there exist significant concerns about racial bias, fairness, and transparency as these tools gain traction. The data obtained by the algorithm reflects historical biases, such as the disproportionate policing and arrest rates in minority communities, which result in prejudice against certain communities. If predictive policing targets certain communities and arrests the person based on data that is flawed, it will risk the very principles of fairness and justice.

INTRODUCTION

Background

Recently, the concept of the Predictive Policing Algorithm has been used by the Police Department. They often use automated systems based on algorithms to improve existing police services. Although the algorithm they use comes with unintended drawbacks. One of the important drawbacks of this algorithm is bias, as the data which being used while analysing the data is discriminatory against marginalised and minority communities. Most of the cities in the US have abandoned this practice due high cost. In some fields, it is believed that the algorithm has the potential to transform law enforcement by enabling police to prevent future crime.

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What is Predictive Policing?

Predictive policing gathers data from different sources, the data is analysed, and the result received will help to prevent, anticipate and respond to future crime more effectively. The eminent benefit of predictive policing is the discovery of new or previously unknown patterns and trends. The algorithm of this predictive policing is not meant to replace the previous police techniques. Notwithstanding, it borrows from the principles of problem-oriented policing, community policing, evidence-based policing, intelligence-led policing and other proven policing models. With a predictive policing algorithm, we have the essential tools to put cops at the right place at the right time or bring other services to impact crime. The data that is being used in decision-making around predictive policing comes from compiling and analysing historical criminal data and police activity. Relying on historical criminal data to make policing decisions is inherently biased, as data shows that the Black community is disproportionately negatively impacted in the criminal justice system.

RESEARCH PROBLEM

Introduction to automated systems based Predictive Policing Algorithm; it has both good and bad effects. On the one hand, it helped the law administration to prevent future crime by analysing the crime data. Jurisdictions that are using this tool argue that it enhances public safety, but in reality, there is growing evidence that automated systems-driven predictive policing perpetuates racial bias, violates privacy rights, and undermines public trust in law enforcement. The nature of the algorithm does not allow for public input or understanding of how the decision is made in the algorithm. Over policing has already done tremendous damage to certain communities, and if the use of this algorithm continues, it will erode the public trust.

PURPOSE AND OBJECTIVES

This article is made to explore the ethical or moral challenges that come with using automated systems in predictive policing algorithms. Its specific objects are:

- To examine whether Predictive Policing Algorithms fortify racial bias by relying on historical crime data.
- Evaluate the transparency and accountability mechanism.
- Analyse the long-term consequences of predictive policing on public trust.

SIGNIFICANCE

Predictive policing tools have sparked serious concerns about racial bias and fairness in law enforcement. Because these systems rely on historical crime data—which often reflects past policing biases—they risk perpetuating discrimination against marginalised communities. This leads to over-policing in minority neighbourhoods while eroding public trust. Research reveals the legal and ethical pitfalls of using automated tools in policing, making a compelling argument for reform. To ensure fairness and accountability, changes must prioritise civil rights and transparency. These findings should encourage policymakers, law enforcement, and tech companies to reconsider—or even stop using—flawed algorithms that reinforce inequality. Instead, we need policing strategies that are equitable and effective for all communities. By focusing on real-world consequences, this study calls for a shift toward technology that truly supports justice rather than distorting it. The takeaway is clear: in policing, human oversight and ethical standards must take precedence over blind reliance on automation.

LITERATURE REVIEW

Current Applications of Automated Systems in Predictive Policing Algorithms

Automated systems are being used in every part of the Predictive Policing Algorithm across various countries. This algorithm is more prevalent in the US, having different uses or functions. To understand what the application of this automated system is, a person has to understand both the good and bad sides of automated systems. In the United States, automated systems in Predictive Policing Algorithms are used to analyse and predict future criminal activity and the location of the event. This is done by using the automated systems in the Predictive Policing Algorithm, which can be traced to the policy approach of social governance, in which the leader of the Chinese Communist Party, Xi Jinping, announced at a security conference in 2016. This algorithm is used to predict the location and forecast criminal activity, to efficiently place law enforcement resources. This is mostly used when there is a presumption of the occurrence of the criminal activity, but its widespread use has been met with controversy as the automated systems have been showing racial biases and are not equitable. Sarah Brayne [Sarah Brayne, ‘Big Data Surveillance: The Case of Policing’ (2017) 82 *American Sociological Review* 977.] analysis revealed that big data and expanding surveillance are reshaping the policing system. It reveals that big data does not compel taking into account the human-based judgement, rather, they are heavily relying on historical uneven

data automated systems. The Predictive Policing Algorithm is not just used for finding future crime activity and location. It can also be utilised as a tool for discovery and legal research. These tools can be very useful to increase efficiency, but it does directly interfere with the traditional policing process. Meanwhile, the US has started using automated systems in Predictive Policing Algorithm by taking into account mathematics, predictive analysis and other analytical techniques in law enforcement to identify potential criminal activity. Predictive Policing can be divided into 4 categories.

- Methods for predicting crimes
- Methods for predicting offenders
- Methods for predicting perpetrators' identities
- Methods for predicting victims of crime

METHODOLOGY

Research Design: This research has the unique aim of being appropriate for exploring issues related to introducing automated systems in the predictive policing algorithm. This kind of approach allows for a deep examination of the historical uneven data, legal challenges, and practical applications of automated systems in policing algorithms.

Participants/Subjects: The participants or subjects of this research will include multiple groups of individuals and professionals who are affected directly or indirectly by the predictive policing algorithm. First, law administration officials such as police officers and department leaders who are actively using this algorithm or have experience with predictive policing tools will be creating a huge impact among the participants. The perception will help to understand how these technologies will be implemented, and the drawbacks arising from them can be perceived. Second, legal professionals who are working in these fields, including judges, prosecutors, and defence attorneys, will be consulted to examine the legal implications, fairness, and constitutional challenges associated with automated systems-based policing. Third, data scientists and technologists who develop or audit these algorithms will be involved to provide a technical perspective on how the systems are built, the quality of the data they rely on, and the potential for embedded bias.

Data Collection: This Data was collected through various ways to make sure to get a complete understanding of the topic, which included Literature Review: Articles, publications, and government reports were studied to collect existing knowledge on automated systems use in predictive policing algorithms. This review was made to focus on finding points related to benefits, risks, ethical concerns, and regulatory frameworks.

Data Analysis: The data behind predictive policing paints a worrying picture. At first glance, these algorithms seem like smart tools designed to help law enforcement do their jobs better—predicting where crime might happen or who might be involved. But once you look closer, it becomes clear that these systems aren't just working with neutral facts. They're learning from years of biased and uneven law enforcement practices, and that's a serious problem.

Biased Data Means Biased Predictions: One of the clearest issues is that predictive policing tools rely heavily on historical crime data. But that data doesn't tell a fair story. It reflects patterns of over-policing in certain neighbourhoods—especially communities of colour. For example, research has shown that in many American cities, Black people are arrested at rates far higher than white people for the same kinds of crimes. If you feed that kind of skewed data into an algorithm, the results will be just as biased.

A few numbers stand out;

- In Los Angeles, almost half of all police stops used in predictive algorithms involved Black residents, even though they make up less than 10% of the city's population.
- A well-known risk assessment tool, COMPAS, was found to label Black defendants as high-risk at nearly twice the rate of white defendants, even when their actual re-offence rates were the same.
- One study published in Nature found that these tools keep sending police to neighbourhoods that were heavily policed in the past—not necessarily where crime is happening now.

So instead of removing bias, these tools often end up locking it in—and repeating it.

People Don't Trust Systems They Don't Understand: Another big concern is how little people know about how these algorithms actually work. They're often designed in ways that make it hard—even for experts—to figure out why the system made a particular prediction.

That lack of transparency erodes trust, especially in communities that already feel over-surveilled or mistreated by law enforcement. Public opinion supports these concerns. A Pew survey found that more than half of Black Americans believe predictive policing will only worsen discrimination. Even among the broader population, many doubt whether these systems can ever be truly fair. In some cities, backlash has been strong enough to force police departments to abandon these programs altogether. When communities don't understand how these tools work—or feel shut out of the conversation—it only fuels distrust in both the technology and the authorities using it.

Legal and Ethical Red Flags: The legal concerns run just as deep as the ethical ones. Can a system built on racially biased data ever truly be fair—or even constitutional? What does it mean for justice if someone gets flagged, questioned, or even arrested based on a computer's guess, especially when they've done nothing wrong? Legal scholars argue that predictive policing may clash with fundamental rights, like the constitutional guarantee of equal treatment. And then there's the privacy problem: these tools often scrape personal data—from surveillance cameras, social media, or other government records—without people ever knowing or agreeing to it. The bigger issue is that technology is racing ahead, but the laws meant to keep it in check are lagging. Without clear rules, the door is wide open for misuse—or worse.

ETHICAL CONSIDERATIONS

Using automated systems in predictive policing raises serious ethical dilemmas, with three major concerns standing out: biased algorithms, lack of transparency, and unclear accountability.

Biased Algorithms: This is perhaps the biggest ethical red flag. If historical crime data reflects societal prejudices like racial profiling or gender discrimination automated systems trained on that data will inevitably repeat those same biases which results unfair targeting and unjust outcomes.

Lack of Transparency: Many automated systems operate like black boxes—even the people using them don't always understand how decisions are made. When police and the public can't see how predictions are generated, trust erodes, and accountability vanishes. Complex automated systems models like neural networks make decisions that are not possible for humans to understand. This lack of transparency poses significant challenges to due process.

How can a person challenge an automated system's decision if they cannot understand the reasoning behind it?

Accountability Gaps: This problem occurs when an automated system makes an error or produces an unjust outcome. Who is responsible—the developer who created the algorithm, the police or constable who relied on it, or the law administration that implemented it? Legal frameworks that exist nowadays often struggle to determine who is liable in such cases. The use of automated systems in predictive policing raises bigger ethical questions about the nature of justice. Can an automated system truly understand the feelings of human behaviour and context that are important for making fair and just decisions?

RESULTS

The research revealed several key findings regarding the use of automated systems in predictive policing.

Benefits of automated systems Integration: Most of the law experts said that automated systems reduced the time used on daily tasks like going through all the historical data and predicting the crime event location. Automated systems can go through thousands of historical data points within minutes, which help police or constables to focus on more relevant things. By making policing algorithms automatic, automated systems can improve access to justice for minorities who are facing discrimination.

Risks Associated with Automated Systems Use: A big concern raised was that automated systems could be influenced by the existing biases seen in historical, uneven data. If the automated systems are trained on bias that shows unequal treatment, they may give discriminatory results. Police experts were concerned that increased use of automated systems could reduce critical thinking among police administration and lead to a reduction in the traditional policing system.

DISCUSSION

The findings made it difficult to use automated systems in predictive policing, as there are many advantages in doing it, but it also came with a lot of difficulties, which may violate the rights of the people whose justice is left without change.

COMPARATIVE ANALYSIS ACROSS COUNTRIES

Different countries have adopted different approaches regarding regulating automated systems in predictive policing:

In the United States, while some states have begun using risk assessment automated systems in predictive policing, there are no proper rules that govern these algorithms in US. Partial ban on 'predictive' policing [European Commission, 'AI Act Final Text (Partial Ban on Predictive Policing)' (2024) <https://ec.europa.eu/ai-act> accessed 18 July 2025.] and crime prediction systems included in the final EU Automated Systems Act.

IMPLICATIONS FOR PRACTICE

- We need clear, well-designed rules for how predictive policing systems work - rules that guarantee transparency, accountability, and equal treatment for all communities.
- As predictive policing technology advances, we'll need ongoing research and open reporting about potential biases and how decisions are made.
- Any predictive policing system must be built from the ground up with fairness, openness, and responsibility as core principles.
- We should carefully study how predictive policing affects our justice system in the long run, not just when these tools are first introduced.

CONCLUSION

In the end, while data-driven tools could help police work more efficiently, we have to proceed with caution. These systems can process vast amounts of historical crime data, but without proper safeguards, they risk reinforcing bias, operating in secrecy, and producing unfair outcomes. If we're not careful, what's meant to assist law enforcement could end up distorting justice instead. That's why strong regulations are essential—to ensure these tools are used

transparently, held accountable, and always kept under human judgment. Ultimately, technology should only support policing in limited, well-defined ways—never replace the core principles of fairness, ethics, and officer discretion that keep communities safe.e

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