Journal of Advances and Scholarly Researches in Allied Education
Vol. 16, Issue No. 5, April-2019, ISSN 2230-7540

https://doi.org/10.29070/p2qqng11

Legal and Ethical Implications of Predictive Policing Technologies

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Abstract - Predictive policing, a rapidly growing area of AI in law enforcement, uses algorithms to predict potential criminal actions, aiming to improve resource allocation, faster reaction times, and crime prevention. However, concerns about its efficacy, potential biases, and ethical implications persist. This study examines the data-driven approaches and dependence on previous crime data used by predictive police algorithms. The primary ethical concerns raised by predictive policing include data selection, machine bias, forecast visualization and interpretation, openness and accountability, efficiency and timeliness, and stigmatization of people, places, and things. These concerns have implications for the law, particularly privacy issues. The existing legal system, primarily focused on protecting individual rights, does not address these concerns for organizations and their potential impact. Building trust is a major social problem surrounding the use of predictive policing. This review, created in collaboration with European law enforcement agencies and civil society representatives, argues that the effectiveness of predictive policing in reducing crime rates remains uncertain.

Keywords: Predictive Policing, Artificial Intelligence, Surveillance, Ethics, Human Dignity

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INTRODUCTION

The basic idea of predictive policing is to combine and analyse data from many sources in order to better prepare for, react to, and prevent future criminal incidents. Losing the tendency to react is a key component of predictive policing. “The predictive vision moves law enforcement... from focusing on what happened to focusing on what will happen and how to effectively deploy resources in front of crime, thereby changing outcomes,” says Charlie Beck, head of the Los Angeles Police Department.1 According to Beck, one of the best things about predictive policing is that technology may help find trends and patterns that weren't there before. The Los Angeles Police Department has discovered its own minor trends in data analysis that have allowed it to effectively predict and prevent crime, much as Walmart discovered an uptick in demand for strawberry Pop-Tarts in the days leading up to big weather events.

The purpose of predictive policing, according to the symposium presenters, is not to replace more traditional forms of police work. It takes its cues instead from tried-and-true police approaches like problem-based, intelligence-led, community, and evidence-based policing. “This is a very important next step to move forward in the evolutionary process of our profession,” said Bill Bratton, former LAPD chief and chairman of Altegrity Risk International. "For the greater good, we are constructing upon the fundamental components of all police strategies." "This is a framework to help us organize policing as an information-intensive business in an information age," said John Morgan of the National Institute of Justice's Office of Science and Technology. He made it clear that predictive policing is not designed to supplant other approaches to law enforcement. On the contrary, it improves our ability to accomplish these tasks.

This paper presents predictive policing within the context of various broader policing trends, including digitization, identification, the shift towards future-oriented action, economic and political pressure on police organizations, and the strategies, tactics, and programs for crime prevention that have arisen in response to these trending topics. Predictive policing is also not an isolated event. Potentially, it's the process of proactively using algorithmically mediated data analysis to discover patterns in datasets; from there, risk estimations are generated for either people or places, and these predictions are turned into targeted preventative actions. But there isn't just one model, procedure, algorithm, or piece of software; there are many. Instead, "predictive policing" has become a catchall phrase encompassing a myriad of approaches that police departments have taken in the last decade

to deal with the future via the manipulation of algorithmic data analysis. It may use limited datasets created by law enforcement agencies or it might explore "Big Data" by combining data from many sources. Either machine learning dynamics or static, rule-based algorithms might form its basis.

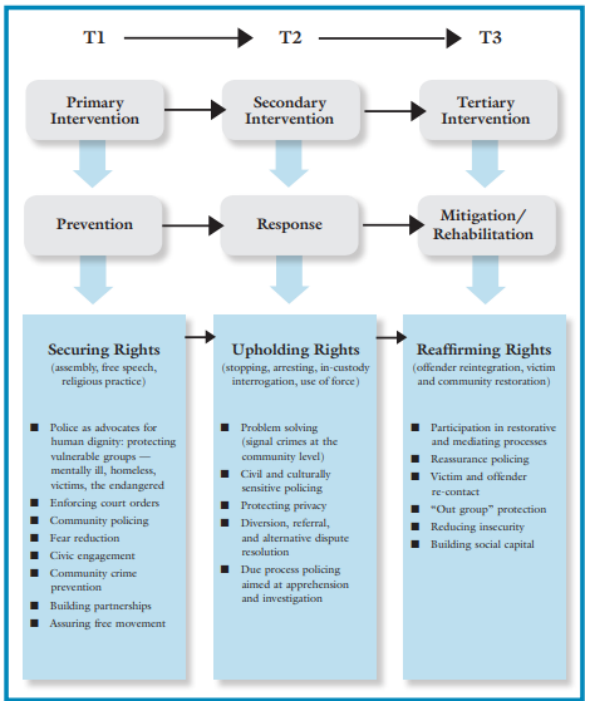

Figure 1. Policing for human rights through the intervention continuum

LITERATURE REVIEW

Ferguson, Andrew. (2011). Predictive policing is a new law enforcement approach that uses past data to predict future criminal behaviour. This approach is used in many big cities as a smart-policing approach, utilizing complex computer algorithms to anticipate future occurrences based on historical crime trends. The first outcomes have proven effective in decreasing criminal activity. This article examines how predictive policing has changed the concept of reasonable suspicion and affected the Fourth Amendment. Existing Fourth Amendment jurisprudence is based on predictions, such as search warrants and investigative detentions based on suspicions of criminal activity. Fourth Amendment notions like "probable cause," "reasonable suspicion," "drug courier profiles," "high crime areas," and informant tips are based on predictions. Predictive policing fits well into this long-standing practice, but a thorough understanding of the technology is required to significantly impact reasonable suspicion analysis under the current Fourth Amendment concept.

Haberman, Cory & Ratcliffe, Jerry. (2012). This research explores the use of near repetition phenomena in law enforcement to predict crime trends. It examines Philadelphia armed street robbery data and investigates the impact of near repetition chains on the temporal stability of micro-level armed street robbery hotspots. The results show that near-repeat armed street robberies are typically brief, with days between the start and finish rarely exceeding seven. This suggests that police need intricate organizational and analytical capabilities to anticipate and respond to short-term crime events. The study also found that the frequency of near-repeat incidents within armed street robbery hot spots is not related to their temporal stability, suggesting that long-term measures can be taken to reduce these hot spots.

Van Brakel, Rosamunde. (2016). The positive and negative impacts of Big Data on various social domains, including advertising, medicine, climate change, and the social sciences, have been extensively documented in literature from a variety of perspectives, including legal, business, and critical data/surveillance studies. The consequences of Big Data applications on individuals within the framework of law enforcement, however, have received very little research interest. This chapter aims to clarify predictive Big Data policing and talk about the pros and cons of this kind of pre-emptive monitoring in order to help readers make more informed decisions.

Oswald, Marion & Grace, Jamie. (2016). This article explores the use of algorithmic analysis in the UK's police intelligence, aiming to develop predictive strategies and tactics. However, this raises ethical and legal concerns, including privacy and prejudice concerns. UK police forces were asked to understand the prevalence of algorithmic intelligence analysis, how they handle intelligence, and how they regulate and oversee disciplinary matters related to intelligence handling. Despite methodological limitations, the article provides recommendations on the legitimacy, transparency, and accountability of police intelligence analysis using algorithmic algorithms. The study aims to draw conclusions about the differences and disparities in evolving practices, highlighting the need for more informed decision-making in police intelligence analysis.

ETHICS AND HUMAN RIGHTS MATTER FOR PREDICTIVE POLICING

The European Union (EU) is based on principles of liberty, democracy, respect for human rights and fundamental freedoms, and the rule of law. These principles are a synopsis of the constitutional traditions of European nations that the EU lacks the authority to rule. The EU and its member states' public administration, including law enforcement, is subject to the rule of law, aiming to promote human dignity through individual fundamental rights and freedoms, and controlled by the people through a representative democracy system. The European Union (EU) and its member states have signed international agreements, such as the ECHR and the Council

of Europe's Convention for the Protection of Individuals with regard to the Automatic Processing of Personal Data (Convention 108). Digitalization and technological advancements present LEAs with new possibilities for proactive measures by leveraging massive volumes of data from diverse sources. However, the revelations about global surveillance by Edward Snowden in 2013 have brought attention to the necessity for increased public and political discourse surrounding the utilization of data within the framework of law enforcement.

Human rights concepts on a global and European scale are vague and generic, making it difficult to agree on how exactly those rights should be understood. This is why there is room for ethical discussions to enhance the discourse and decisions made by decision-makers. A broad and in-depth discussion that includes ethical concerns when thinking about using innovative approaches like PP, which is based on new technology like automated decision-making and Big Data, is essential.

Recognizing the role of LEAs in Europe and the importance of public security is another critical component. One of CCI's main goals is to help make communities safer by providing law enforcement agencies with resources they may use in their battle against crime. This conception of security involves human dignity and individual freedom from an ethical, legal, and social standpoint.

In situations involving data used by law enforcement or third-party proprietary technologies, it is essential to note the significance of international human rights legislation and European frameworks. While some entities, like the European Union and the United States, work to fill loopholes for investigative reasons, other LEA initiatives, like PP, are mostly unaffected. Given the lack of comprehensive legislative structures that tackle this issue, the focus shifts to human rights and ethics, which transcend borders and pertain to all people.

EFFECTIVENESS OF PREDICTIVE POLICING

Numerous cities throughout the globe have used predictive policing, and as a result, crime rates have dropped significantly. Key case studies demonstrating the effectiveness of predictive policing tactics are examined in this section.

1. Los Angeles, California: The Los Angeles Police Department (LAPD) has implemented predictive policing as part of its Operation LASER program. This tool uses algorithms, geographic information systems, and past crime data to identify crime hotspots. Within the first year, violent crime in some regions decreased by 25%. The LAPD plans to focus on high-crime areas and use real-time data to prevent crimes.

2. Chicago, Illinois: Chicago's Police Department uses predictive analytics system "HunchLab" to predict future criminal activity based on crime statistics, socioeconomic information, and environmental elements. Over two years, neighbourhoods using HunchLab saw 12% fewer shootings compared to those without the system, according to research from the University of Chicago Crime Lab. This success demonstrates the effectiveness of data-driven techniques in reducing crime through strategic resource use.

3. Memphis, Tennessee: The University of Memphis and the Memphis Police Department developed the "SARA" predictive policing software to efficiently use departmental resources by detecting criminal activity trends. Research from the University of Memphis showed that participating communities saw a significant decrease in drug-related crimes and a 20% decrease in property crimes, demonstrating the quantifiable impact of targeted actions on crime reduction.

4. Kent, Washington: The police force in Kent has used predictive policing tactics with the help of the PredPol program, which uses machine learning algorithms to pinpoint areas that may be prone to crime. After one year of the program's launch, the Kent Police Department reported a 20% drop in burglaries and a 13% drop in violent crimes. Officers might prevent would-be criminals and react faster to situations if they concentrated patrols on certain locations.

5. Richmond, Virginia: The Richmond Police Department implemented predictive policing to reduce gun violence. The software used algorithms to analyse crime data, identifying potential offenders or victims. This led to a 40% decrease in gun violence over two years. This approach not only reduced crime rates but also improved community safety. By utilizing data-driven methods and advanced analytics, law enforcement can focus on prevention and optimize resources, resulting in safer communities. This proactive approach to policing can be a significant step towards reducing crime rates.

IMPACT ON LAW ENFORCEMENT PRACTICES

Allocation of resources, patrol tactics, and operating rules are just a few areas where predictive policing technology have had a huge impact on how law enforcement does its job.

1. Resource Allocation:

By pinpointing areas where crime is most prevalent, predictive policing systems help police departments better use their resources. By using this data-driven strategy, law enforcement agencies may concentrate their efforts on regions with a history of higher crime rates. Consequently, police may station themselves more heavily in

areas deemed to be particularly dangerous, which may reduce crime rates. (Perry et al., 2013).

2. Patrol Strategies:

The use of judgment and experience by patrol officers was common in the past. Patrol tactics, however, have developed to integrate algorithm-generated insights as a result of predictive policing. Predictive analytics enable the strategic deployment of troops by assigning officers to certain areas at particular times (Ratcliffe, 2016). An approach to crime prevention that is proactive, rather than reactive, may be fostered by this change.

3. Operational Practices:

Novel approaches to investigating and responding to crimes have emerged as a result of the widespread use of predictive analytics in business processes. Officers get training to analyse data outputs and modify their approaches appropriately. Because of this change, police agencies are rethinking their training programs and placing a greater emphasis on data literacy and the significance of knowing how their initiatives will affect the community.

Figure 2. Role Distribution in Future Law Enforcement

ETHICAL IMPLICATIONS OF PREDICTIVE POLICING

➢ **Surveillance and Privacy Concerns**

Concerns around privacy and surveillance have grown in tandem with predictive policing, prompting important moral inquiries on data collecting methods and their effects on civil rights. Law enforcement organizations may now monitor communities and people in ways never before possible because to the incorporation of new technology like big data analytics and machine learning. However, the boundaries between public safety and personal rights are frequently blurred in the process.

1. Privacy Violations:

The possibility of privacy abuses is one of the main worries with predictive policing. A wide range of sources, such as social media activity, location monitoring, and past crime data, are often used in these systems' broad data collecting procedures. Invading people's right to privacy, these monitoring systems might collect personal data without their knowledge or permission. Opponents of these policies say they make regular people feel threatened and contribute to an atmosphere of suspicion and dread.

2. Data Collection Ethics:

Data gathering ethics in predictive policing are a hotly debated topic. There is a vicious circle of discrimination against already-vulnerable populations since many algorithms rely on data that may be biased by systemic prejudices. Unfair targeting of certain groups may occur when algorithms are fed data that is based on biased police tactics. Concerns concerning ethics and responsibility in law enforcement arise from the opaque nature of data collection, storage, and use. The public's faith in law enforcement agencies may be further damaged in the event that proper protocols are not in place to prevent the exploitation and abuse of personal information.

3. Issues Surrounding Mass Surveillance:

Mass surveillance strategies are often used by predictive police technology; as a result, whole communities may be monitored instead of particular people or their actions. There are dangers of establishing a surveillance state and privacy issues with this method. With the growing dependence on technology for crime prediction and prevention, the risk of overreach and abuse is a real concern for law enforcement authorities. Suppressing democratic norms, the normalization of widespread monitoring might make people less likely to speak freely.

4. Legal and Regulatory Challenges:

The development of predictive police technology has led to significant gaps in legislation protecting individuals' rights. Many countries lack adequate data privacy and surveillance regulations, exacerbated by the intricacies of police technology. The absence of regulations can lead to police agencies being unreliable and magnifying the risks of intrusive monitoring tactics. To maintain democracy and civil liberties, law enforcement must strike a balance between data-driven tactics and protecting the public while safeguarding individual rights.

➢ **Accountability and Transparency**

New concerns about unfair or biased results have arisen in relation to the lack of openness and accountability caused by the growing use of predictive policing algorithms in police operations. In light of these difficulties, important concerns about the moral and practical consequences of implementing sophisticated algorithms into police work arise.

1. Lack of Accountability Mechanisms: The lack of adequate accountability procedures is a major obstacle to holding predictive policing technologies responsible. The algorithms used by law enforcement agencies are often proprietary, which makes it difficult for other parties to conduct monitoring. Independent audits or evaluations of the efficacy and fairness of these algorithms may be impossible to accomplish if the private corporations that created them see their methodology as trade secrets. So, it's hard to find out who's to blame when these algorithms make mistakes or create biased results, so no one is held accountable for the problems that arise from it.

2. Algorithmic Opacity: Accountability initiatives are further complicated by the opaque nature of predictive police systems. Complex machine learning models are used by many law enforcement organizations, and not even the creators of these algorithms completely comprehend them. O'Neil notes that stakeholders including community members, civil rights groups, and regulatory agencies may find it difficult to assess the systems' possible biases and mistakes due to this lack of transparency. Ethical questions about the justice of results produced by predictive police systems and a decline in public confidence might result from an absence of transparency regarding decision-making processes.

3. Bias and Discrimination: In order to hold predictive police algorithms accountable, it is crucial to address instances when they provide biased results, such as disproportionate targeting of specific ethnic or socioeconomic groups. The problem with algorithmic decision-making bias, however, is that it is hard to detect and measure. To ensure that law enforcement agencies are held responsible for their activities, there must be strong systems in place to evaluate algorithmic bias (Lum & Isaac, 2016). Transparent assessment frameworks should comprehensively investigate predictive police systems in light of this persistent issue.

4. Legal and Regulatory Gaps: When it comes to holding predictive police algorithms to account, the existing legal framework is sometimes lacking in clear standards. Law enforcement agencies may have a lot of leeway in deciding how to use these technologies since current regulations don't always address the moral concerns that arise from their use. When communities experience unfair charges or disproportionate policing, they may not know where to turn for help due to the lack of regulation. In order to guarantee fair practices in law enforcement, it is essential to strengthen rules and establish transparent accountability mechanisms for the use of predictive policing technology.

5. Community Involvement and Oversight: Community engagement in monitoring predictive policing programs is essential for improving accountability and transparency. To make sure that police procedures are in line with what the community expects and values, it is important to cooperate with community members to create accountability frameworks. By bringing in different viewpoints, this cooperative method builds confidence and has the potential to provide more fair police results. To sum up, protecting civil liberties and fostering fair police methods necessitates resolving the issues of oversight and openness in predictive policing. Transparency in system operation and accountability for results are essential concerns as technology maintains a pivotal position in law enforcement.

CONCLUSION

Finally, it is important to proceed with caution and moderation when using AI-driven crime prevention measures, despite the fact that they have great promise for improving efficiency and safety. To guarantee that AI is used in this field in a responsible, egalitarian, and value-aligned manner, it is imperative that lawmakers, law enforcement agencies, and tech companies work together. Doing so will allow us to take use of AI while avoiding its problems. Europe, especially Germany and the Netherlands, is seeing PP become more commonplace. In addition, the empirical study showed that PP is not a cookie-cutter method; rather, there are variations among the nations in terms of the data sources used and how they are combined. Compared to the Dutch, Germans are more hesitant to use data for preventive governance activities due to the country's setting. Simultaneously, the comparison begs the question of whether, by digitizing LEAs' work, we will see how their conventional roles change and how their future duties and techniques will be more clearly defined.

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