

**How Do Groups React to Controversies in Predictive Policing Softwares and What Lessons  
Can be Learnt from Understanding those Controversies**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this  
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## **Introduction: Tracking Down Criminals Ahead of Time**

For centuries criminal profiling has been used as a means of figuring out the answer to the age-old question: who done it? Modern day technology and innovations have advanced the way that law enforcement approaches criminal profiling - using a method called predictive policing, they can now use machine learning to profile potential criminals before they even get to commit a crime (Ramesh, 2021). Some community members were appreciative of these new technologies; by tracking down criminals before they've done the crime, their communities should theoretically become safer. On the flipside, there are certain groups that are fearful of the implications of predictive policing softwares. Over the past few years those predictive softwares have been suspected of containing biases against marginalized communities, as those groups are disproportionately impacted by the softwares' outcomes; therefore, they face more scrutiny and suspicion than normal from law enforcement and other society members. Regardless of whether they contain biases, predictive policing impacts different societal groups differently, and in turn, the way that society perceives and tries to control predictive policing also changes. All of this boils down to one question: how do poorly designed policing algorithms become controversial and how do societal groups react to those controversies as they start to emerge? To understand this question, a case study will be conducted for PredPol, a predictive policing algorithm that the Los Angeles Police Department (LAPD) had helped create but stopped using in 2021 due to public backlash. By understanding the controversies that emerged from PredPol and the steps that were taken to address them, societal groups can better understand what steps to not take when developing and using predictive policing technologies in the future.

## **Sociotechnical Situation: The Context Surrounding PredPol**

Initially, predictive policing was not developed with the intention of it being malicious or discriminatory. In fact, the LAPD had assisted in PredPol's development so that it would be a tool for the greater good, as it was intended to be used to prevent gun crimes and burglaries (*PredPol Rolls out Crime Prediction Technology*, 2013). It was meant to aid the police in maintaining a safer community. However, data is cold and unfeeling. Datasets cannot decipher intentions or understand goodwill, so when models are created using biased data, the underlying datasets subsequently cause those models to be biased as well. When models are used to predict trends in crime, they will simply present outputs related to the information that was obtained over time in the dataset. This idea can be demonstrated through PredPol and the data that was fed into it.

The algorithm behind PredPol accepted three main inputs: crime type, crime location, and time of crime (Ballantyne, 2023). When the creators of PredPol were making its algorithm, their intention for using those three fields was to eliminate any demographic biases that might have appeared in the dataset, and this was their attempt at making sure that the software was not biased (Ballantyne, 2023). However, its critics were quick to point out that eliminating biases would not be as simple as not using demographic information as fields in the algorithm. Oftentimes, there are large income divides between different neighborhoods and communities, and since PredPol bases its decision by location, low-income, medium-income, and high-income communities are targeted unequally by its decisions (Ballantyne, 2023).

By inadvertently having income-based biases, PredPol also ended up having racial biases built into it. Poverty rates vary by race, so since some racial groups are more likely to be in lower-income neighborhoods, they were disproportionately affected by PredPol. While non-Hispanic White people have the lowest poverty rates at 7.7%, Black people have the highest rate

at 17.9% (Federal Safety Net, 2022). This trend could be seen in PredPol as well. Black communities were targeted approximately two times more than White communities, and areas with minorities were most common in PredPol's predictions (Gilbertson, 2020). In fact, in a research study done by Lum & Isaac, they found that even though drug usage was spread fairly evenly across the city, PredPol claimed the minority communities were drug crime hotspots (Lum & Isaac, 2016). So even though PredPol was created with the good intentions of being free of bias, its predictors were inherently connected to biases.

So, what causes people to care about data and data models' inability to understand the presence of biases? The answer is quite simple - the results directly impact their lives. When the police, an integral part of society, deploy practices and technologies that are discriminatory, many different societal actors are negatively impacted. The communities targeted more frequently by PredPol had increased police surveillance, which led to the overall decline in the physical and psychological wellbeing of the residents (Lum & Isaac, 2016). Historically marginalized and disadvantaged communities can also be further discriminated against. Societal groups start to believe in biased outputs from the models and subconsciously discriminate against marginalized groups. With the police, a positive feedback loop is created. By believing in biased outcomes created by biased data, they commit discriminatory acts. The records of these acts are then fed back into the model, making it more and more biased over time. Since PredPol is a data model that can't understand that its decisions are discriminatory, it continues to give out biased decisions and reinforce its own algorithm based on those biases (Lum & Isaac, 2016).

The analysis conducted later within this paper shows that initially, coverage on PredPol tended to be either neutral or positive. Earlier coverage focuses on the introduction of PredPol and its alleged capabilities. Over time, the situation with PredPol started to escalate to levels

where it brought the attention of law and policy makers. They were pulled into the cycle by outrages from the people. Once the situation starts to escalate past a certain point, policy makers and law enforcement start to take action. In the case of PredPol, its critics gathered academics and other lobbyists to speak out against its usage and urge lawmakers to push for more regulations, and eventually, this led to the LAPD retiring PredPol (Field, 2020).

### **Literature: What is the current scholarly status on predictive algorithms?**

Since the introduction of predictive algorithms, there have been many scholarly opinions on their creation and their usage. While non-scholars tend to be optimistic about the use cases for predictive algorithms, scholars seem to be more focused on the mechanisms that create predictive algorithms and their implications. The consensus on predictive algorithms seems to be that though predictive methods can be helpful, problems emerge when the data is biased (Floridi, 2023).

But do all scholars even believe that algorithms are biased? Brantigram, Valasik, and Mohler (2018) found that even with predictive policing algorithms the number of arrests against marginalized communities stays the same both with and without the usage of predictive algorithms. However, they also state that arrests done without the usage of the algorithm may have been systemically biased, implying that then, the algorithm would have been biased as well. Other scholars say that since biases and prejudices are so deep-rooted within past and present-day society, large datasets feeding into algorithms will have biases regardless of what other metrics or people say (Bell et al., 2021). Goldkamp (1987) takes on a more data-oriented perspective, and he says that due to subjective opinions of humans, different people could react to the same situation differently. This subjectivity makes the decisions made in the justice system

arbitrary, and since different judges might issue different sentences, many situations will not have clear patterns (Goldkamp, 1987). Therefore, he says that models built with those datasets have large amounts of variance and are not reliable (Goldkamp, 1987, p. 114).

Regardless of opinions on the usage and biases of predictive algorithms, scholars seem to unanimously agree that bias, whether introduced through the entry point of data collection or the review process, should be mitigated through human intervention (Travaini et al., 2022). Scholars recognize that algorithms cannot learn outside of the data that is given to them, so if the datasets being fed into them are biased, those algorithms will also be biased (Sousa et al., 2024, Chapter 14, p. 283). Dignum (2019) believes that responsibility for reducing the impact of biases from algorithmic decisions falls upon the users of the algorithms.

So, how do scholars believe that predictive algorithms should be used? Taylor says that algorithms can help reduce bias, giving the example that judges are more likely to issue favorable sentences after having lunch. He argues that an algorithm would be favorable in such situations because it would not have that source of bias (Taylor, 2023). On the other hand, Benbouzid says that “crime prediction machines are used by governments to shape the moral behavior of police” because they are responsible for predicting crimes and guiding police to potential crime locations (Benbouzid, 2019, para. 2). He further explains this point by claiming that the crime prediction machines distribute police resources to maximize safety and social justice, so if police are frequently distributed to the same communities, police will also start seeing those areas as crime hotspots (Benbouzid, 2019). Other scholars, like Dancy, claim that algorithms do not account for nuanced backgrounds and behaviors of individuals that may factor into their risk level for crimes (Dancy, 2023). Dancy says that predictions can be used, but discussions and questions about those predictions must occur to maintain accountability and

understand what is at stake for individuals affected by the predictions. Scholars' standings on the usage of machine learning in criminal justice changes depending on how they think the algorithms should be used. From these scholars' opinions and studies, a few things are certain: decisions made by machine learning models should not be taken lightly and an understanding of possible biases must be maintained.

### **Understanding Behaviors of Different Technologies and Actors**

To further analyze the effects that biases have in the sociotechnical system, it is necessary to use theories of science and technology studies (STS) as a means of examining the relationship between society and PredPol, as well as to explain the intricacies behind the behaviors of both PredPol and the human actors. The concept of technological momentum can be used to explore the reasons behind behaviors exhibited by both.

The other theory, technological momentum, is the idea that as technologies evolve and grow, they become more embedded in society, become more relied on, and have a greater impact on society (Dyer, 1995). This concept is important because it serves as an explanation for why marginalized communities are wary of predictive policing algorithms. Machine learning algorithms have been around for a while, and people have started to become more reliant on them. Since the outcomes of predictive policing algorithms are biased, members of marginalized communities are scared that law enforcement could become reliant on those algorithms to assist them in their jobs. Law enforcement has been trying to implement predictive policing for over a decade, so clearly, they are working towards a future where they can rely on those predictions to assist them with policing (Vargas, 2023). If law enforcement were to become more trusting of predictive policing algorithms, then marginalized communities would unfairly face even more

pressure from the police. The theory of technological momentum can help explain the motivations for different actors to behave and interact the way they do. In particular, it provides reasoning for the way that marginalized communities view and interact with the police.

## **Methods**

This paper deals with evidence for two purposes: understanding changes in law and policy for predictive justice tools and understanding the general public's reaction to PredPol. These two types of evidence are important because by looking into reactions for each different sector, a general understanding can be created for the mutual shaping between predictive justice algorithms and society. The story of the way the public reacted to PredPol's controversies and the way that PredPol's users and lawmakers reacted back can be uncovered by looking into the evidence collected for this paper.

For analyzing changes in law and policy, the four main types of evidence were: letters written by Congress members, legislation in effect, the Department of Justice's perspective on AI in criminal justice, and stances made by lobbyists. These forms of evidence were analyzed by looking at their introduction/passing dates and seeing if they coincided with relevant dates for PredPol.

News articles were the main sources of evidence for analyzing public opinions, so most of those sources were not authoritative. However, for this research project's purposes, information from the articles does not need to be accurate, as a variety of perspectives will be needed to get a complete picture of the public's reactions. Since there are no polls on PredPol publicly available, news articles are the closest metric for understanding reactions.



## Results

Results contain major events for PredPol, press on PredPol, and policies related to predictive policing, along with details of what occurred in the event. Results are organized in chronological order to assist in understanding how different events were related. Figure 1 displays the timeline of events sorted by the type of event: PredPol-related, policies, and press.

**Figure 1**

*Time of Events Related to PredPol*

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b>PredPol Events</b>	The LAPD starts assisting with the development of PredPol	The LAPD starts using PredPol								In April, the LAPD announces that they will review the fairness and accuracy of PredPol's model and decisions	In April, the LAPD announces that they will no longer use PredPol	In March, PredPol is rebranded as Geolotica		SoundThinking starts acquiring parts of Geolotica	
<b>Policies</b>												In April, Congressmen write a letter to the DOJ: Letter to DOJ on Predictive Policing Tech	In January, the DOJ releases a guide on best practices for AI in justice  In May, President Biden signs Executive Order 14074		In January, Congressmen write a letter to the DOJ: Predictive Policing and Title VI, criticizing their 2022 guide
<b>Press</b>		Primarily introductory articles are released for PredPol, with tones ranging from being neutral to positive		Articles start to introduce doubts about PredPol's capabilities and worries about its potential impacts					Press on PredPol becomes very critical, mentioning issues with algorithmic biases within its model						

*Note.* A timeline of key dates and events for PredPol, policies, and press.

The LAPD assisted with PredPol's development in 2010, and they started using PredPol in 2011 (Ballantyne, 2023). For the next couple of years, news articles primarily introduced PredPol. For example, a 2013 article, written by the PR Newswire, introduces PredPol's software and highlights its achievements in reducing crime rates (*PredPol's Innovative Predictive Policing Software Results in Dramatic Crime Reduction*, 2013). Three years after PredPol's

release, articles started to contain doubts. In a 2014 article written for the Guardian, PredPol's capabilities are introduced in a neutral manner, but the article mentions concerns over whether algorithms like PredPol should be given as much power as it has for decision-making (Berg, 2014). A 2015 Forbes article mentioned concerns people had that since PredPol shows high risk crime areas, police may overestimate the threat posed by residents; therefore, this would cause police to display excessive aggression towards people in the area (Huet, 2015).

From 2017 onwards, press related to PredPol became more critical, containing headlines like *Biased policing is made worse by errors in pre-crime algorithms* and *Agencies take algorithmic effectiveness on faith, with few checks in place*. An article released in 2017 highlights one of PredPol's greatest failings; it creates a feedback loop that causes officers to repeatedly be sent to neighborhoods with minorities (Reynolds, 2017). Due to community pressure, in April 2019, the LAPD announced that they would start evaluating the fairness, accuracy, and implementation of PredPol (Lipton, 2019). Pressure from media and press persisted, with an article from November 2019 having many different professors give statements, all leading to the point that PredPol is biased (Lipton, 2019).

In April 2020, the LAPD announced that they would no longer be using PredPol (Haskins, 2020). In the announcement, the LAPD chief clarified that they believed in the ideals promoted by PredPol, but they would be looking at other systems in the future to predict crime (Miller, 2020). After the LAPD's announcement, BuzzFeed news interviewed individuals from different activist groups, and they believed that it was due to their protests and influence that the LAPD stopped using PredPol (Haskins, 2020). Eleven months later, on March 2, 2021, PredPol announced that they would be rebranding as Geolitica because they no longer believed that the term predictive policing accurately described their model's capabilities (Geolitica, 2021).

Federal Lawmakers only start talking about policies after the LAPD stopped using PredPol. The earliest case is a letter written by Congresspeople in April 2021, almost exactly one year after the LAPD stopped using PredPol, titled *Letter to DOJ on Predictive Policing Tech*. In the letter, the Congresspeople wrote to the Department of Justice (DOJ) to express concerns about the DOJ funding and encouraging law enforcement to fund predictive policing technologies that are currently biased and inaccurate (Wyden et al., 2021). Approximately nine months later, in January 2022, the DOJ released an article detailing best criminal justice practices (Wilkinson, 2022). It had a section titled Civil Rights in the Digital Age, which was meant to address some of the concerns brought up by the Congresspeople in their 2021 letter.

Shortly after, in May 2022, President Joe Biden sent out Executive Order 14074, which further established ground rules and criteria for safe and responsible usage of AI in areas of policy and justice (Exec. Order No. 14074, 2022). Relevant points in the order include having users monitor the systems to submit reports on methods for making their algorithms more accurate and efficient, as well as reviewing the DOJ's ability to oversee the usage and maintenance of AI in law enforcement. In January 2024, the Congresspeople wrote another letter to the DOJ titled *Letter to DOJ: Predictive Policing and Title VI*. This letter was a request to the DOJ for them to stop funding and encouraging the expansion of predictive policing systems until the DOJ would be sure that marginalized communities would not be discriminated against through their use (Wyden et al., 2024). Within the letter, they criticized the article put out by the DOJ in 2022 for not providing any solutions or taking steps to solve the issue with biases in the algorithms. (Wyden et al., 2024) This letter was written four months after it was revealed to the media that SoundThinking, a public safety technology company, started acquiring parts of Geolitica (Mehrotra & Cameron, 2023). Further developments in law and policy have not been

introduced past this point.

## **Analysis**

Interestingly enough, prior to the backlash for PredPol, there weren't any major policies or notions to create policies to manage the usage of predictive technologies in law enforcement settings. Policies only started being introduced and talked about in 2021, about a year after the LAPD stopped using PredPol. Those ideas for restricting predictive policing tools were only introduced as a reactive measure to what occurred with PredPol. From the articles, it can be seen that the press primarily started researching and criticizing PredPol in 2017, approximately four to five years after the LAPD started using it.

Measures by lawmakers and scholars to understand and mitigate the usage and implementation of PredPol should have been taken prior to it being used by the police, but since there was no major precedent for algorithmic predictive policing in America, the proper precautions weren't taken. The lack of protocols caused changes in the way society members view predictive policing. With lawmakers this can be seen in the complete lack of pre-existing policies; in the past, they believed that the algorithms would be reliable and would not need to be regulated, but after PredPol, they started to have an increased interest and wariness towards predictive policing softwares. For critics, though they some were around before 2014, the rise in critical reviews after 2014 can most likely be attributed to PredPol being around for a couple of years. By 2014, PredPol was around for about 4 years, which would have given critics a few years to understand PredPol and its impact on the Los Angeles area. Overall, there is now a level of vigilance concerning predictive software that did not exist when PredPol first came out. Initial feelings for the public aren't apparent, but the lack of press on them could be due to an overall

neutral topic on the matter. However, feelings after PredPol's usage are apparent; community members felt the need to start forming activist groups and protesting the usage of PredPol due to the way their lives were negatively impacted.

## **Conclusion**

The story of PredPol serves as a cautionary tale for the development and deployment of predictive policing technologies and the way that society members should react to them. In the case of PredPol, all actors performed reactive measures: they only started trying to fix things after the damage. To some extent, the actors, particularly scholars and the public, were successful, as they learned more about the workings of predictive softwares and stopped the usage of PredPol by the LAPD. For lawmakers, those measures were taken too late, as policies pushed for in 2021 have still not taken effect. Instead of taking reactive measures, actors should have been proactive and been vigilant about making sure that PredPol would accurately deliver on its promises. PredPol serves as an important lesson for all people either making, developing, or being affected by predictive tools: understanding the workings and impacts of predictive policing is crucial for ensuring fair and accurate decisions.

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