Predictive Policing

SEP-02: Computing and Moral Responsibility

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Contents

Introduction

The role of computers versus their developers in moral responsibility is hotly contested. How does one allocate blame for software issues; are they always the fault of the programmer who designed the software? How is a developer obligated to consider the consequences of their computing? When (if at all) can computers be said to have free will or autonomy, and how do the decisions they make alter the free will and decisions of the humans they influence? Can the computer *itself* be considered to be a moral agent, and how would this affect the computer's programmer? [11] These questions all come strongly into play in the issue of predictive policing.

Predictive policing is a contentious topic in contemporary law enforcement. Its proponents advocate for the use of computers to predict potential criminal acts and to distribute police resources accordingly. Its critics, meanwhile, argue that the opacity of the algorithms can leave no potential for human oversight, and that many forms of racial, gender, and social discrimination can be unintentionally codified by these algorithms.

The city of Los Angeles, California and their police department have been on the leading edge of adopting predictive policing technology, but this also means that they have been at the forefront of legal attention, including a current lawsuit by the Stop LAPD Spying Coalition attempting to put a complete stop to the use of predictive policing technology [5]. This paper focuses on the benefits and drawbacks that the department and city residents have found as they continue to attempt to effectively integrate predictive policing measures into their toolkit. We investigate issues of bias, where the data used by the algorithms in question to predict crime patterns may be skewed or flawed, and issues of privacy, where there are objections to the amount of data that the Los Angeles Police Department collects and shares with third parties that perform analysis on the data collected. Finally, we examine several choices available to the department as they decide whether to go forward with the use of predictive policing software in deciding how they allocate department resources, and contrast the ethical benefits and drawbacks that apply to each possibility.

Predictive Policing

Use of predictive policing to optimize use of police department resources goes back as far as 1999, when the New York Police Department (and subsequently other cities) started use of the software CompStat. CompStat is a software that collects data, analyzes it and maps it, holding police officers more accountable for their performance, measured by this data. CompStat was intended to reduce crime and help achieve police department goals such as protecting constitutional promises while facilitating the movement of traffic and people.

The use of militarized surveillance technology appears to be spreading beyond its initial applications during the mid-2000s in high-crime areas to now target narrow, specific crimes such as auto theft. Now, LAPD and the Los Angeles County Sheriff are monitoring the whereabouts

of residents whether they have committed a crime or not. The biggest surveillance net is license plate reading technology that records your car's plate number as you pass police cruisers equipped with a rooftop camera, or as you drive past street locations where such cameras are mounted. But already at this point, questions were being raised on the ethical dilemma presented by the introduction of new monitoring tools, with claims that the softwares have a tendency to treat the public unfairly.[6]

Despite ongoing controversy, New York maintains use of the CompStat software to this day, a practice for which it still receives negative feedback. The New York Daily News reports [7] that Louis Lopez of Brooklyn, NY, is currently suing NYPD for 70 million dollars as he states the NYPD harassed and falsely arrested his family to keep CompStat numbers down. This was not the only case presented to combat the use of CompStat. CompStat is used countrywide in major cities. The New York Police Department used CompStat to help aid their Stop-and-Frisk program. For this program they would stop sketchy looking individuals randomly. Between 2003 and 2013 there were over one hundred thousand random stops per year. Ninety percent of those hundred thousand were either African-American or Latino. [7] CompStat has produced more than just a racial bias though, as these stop-and-frisks are happening primarily in demographic areas that consist of ethnic minority and low-income people.

Los Angeles, under the direction of then-chief Charles Beck, first introduced predictive policing software in their department in 2011, in the form of LASER, short for Los Angeles Strategic Extraction and Restoration, which maps the city into zones where crimes are thought to be more likely to occur[8]. LASER, developed by Palantir Technologies takes as input data on historical criminal activity by location, as well as location and activity patterns of known past criminal offenders [9]. The total tally of “points” that an offender accumulates corresponds with the perceived likelihood that they are to commit more crimes in the future, and so the LAPD earmarks extra officers to keep a closer eye on them. However, this has also raised ethical questions: Once an offender has served their sentence, is it fair to continue surveilling them disproportionately, or does this invoke something reminiscent of double jeopardy for those who have been marked for additional observation?

The Los Angeles Police department has also been under criticism for their use of software created by PredPol. Predpol is a manufacturer of predictive policing software founded by Jeff Brantingham, an Anthropology professor at the University of California Los Angeles with special research into the areas of measuring and predicting crime using mathematical modeling. [2] PredPol uses data mining technology on data collected from the past decade—specifically crime time, crime location, and crime type—to to create heat maps of where future crime is most likely to occur. The department then designates available units to focus patrolling on these areas. Current Police Chief Michel Moore [3] advocates for these technologies and cites their effects, saying, “It has been noted that a location-based strategy of identifying patterns and series of crime trends at specific locations, corridors or neighborhoods are a proven crime strategy.” [6] Besides the Los Angeles Police Department, PredPol is thought

to be used by dozens of other police departments across the country, though most departments are unsurprisingly unwilling to advertise their use of the controversial predictive policing software. Additionally, concerns have been raised that PredPol is unavailable to entities other than police departments, and as such has not received thorough third-party review to ascertain any biases that it may have.

Machine Learning in Predictive Policing

Many police departments have decided it is to their benefit to enter the era of Big Data, which is an all extensive term for any collection of large data sets that are traditionally hard to process using traditional data mining algorithms. As with other industries, such as insurance, banking, and healthcare, the technological breakthroughs data mining has had has encouraged data scientists to discover a new area of Big Data, law enforcement.

The main algorithm used behind predictive policing would be K-Means clustering. [8] K-means is a popular cluster analysis in data mining. K-means clustering aims to partition n observations into k clusters in which each observation belongs to the cluster with the nearest mean, serving as a prototype of the cluster. For example, in predictive policing the observations would be what time and date the crime had happened at, what kind of crime it was, and the location of the crime. With these 3 observations, they then pick the amount of clusters they'd like to appear on their map, with predictive policing, the amount of clusters should be calculated per city, ut the clusters would appear as the red dots on the map. The clusters would cluster by the location of the crime and type of the crime, and the map would periodically change depending on the past date and times of crimes.

K-means works for this kind of data because K-means is used to cluster data into each other allocating more space and memory, with the police department, K-means works because it clusters crimes together on a map based off of time, date, and place, giving the police the visual of clustered crimes. A prediction on where crimes are going to happen based off of their past clusters. Big data crime prevention is not only very possible, but yields crime reduction results ranging from 20 to 40 percent in the majority of agencies using PredPol. [4] The economic benefits that big data policing provides are tremendous and, most importantly, mean fewer victims through predictions generated from crime data mining.

Opponents of Predictive Policing Software in LA

Most of the major opponents of the use of predictive policing software in Los Angeles have established a united front under the Stop LAPD Spying Coalition. The Stop LAPD Spying Coalition is represented by a variety of faces, including Jamie Garcia, an activist and organizer who researches in predictive policing and police militarization. Garcia initiated the lawsuit against Los Angeles Police Department. When asked about why she has taken on this issue,

Garcia said, “Data can be used as a weapon and will always be used to criminate black, brown and poor people, while these people are not actively committing crimes, the amount of surveillance they recieve could lead the community to a deadly situation.” [13] The lawsuit is backed by attorney Colleen Flynn, a graduate of the Southwestern University School of Law in Los Angeles, California. [5]

Besides locals, there are many other opponents, including prominent computer science researchers and think tanks. Particularly, the AI Now institute, which focuses on the social implications of the increasing uses of Artificial Intelligence in modern society, has been a prominent voice speaking out against the increased use of predictive policing software. They point out that, among other things, predictive policing can help cement biases by the police department, where biased data collected is fed into the predictive policing software, producing biased results which, by nature of being produced by a computer, are less likely to be thought of as possibly biased.

Predictive Policing Drawbacks

Like many policing technologies and practices, predictive policing involves balancing the trade-off between the safety and the privacy of the population that the police department is sworn to protect. Further concerns enter with the fact that much of the software used for predictive policing work is developed in part or in whole by third-party companies like PredPol, and as such is subject to limited regulatory and other oversight. As such, the people being surveilled by the software have no information about the data that is gathered by them, nor whether they are under increased surveillance by the officers of the department. PredPol claims that the only data points collected are the crime type, crime location, and crime date and time, and that no other data is gathered, with a particular effort made to gather zero personally identifiable data, and to scrub any such data that may be gathered[4]. This is the focus of the suit brought by Jamie Garcia, Colleen Flynn, and the Stop LAPD Spying Coalition against the Los Angeles Police Department: predictive policing is a major invasion of the privacy of Los Angeles residents.

PredPol also claims to gather no data on the demographics of the people being surveilled, which they say makes their software immune to human biases about race and gender that police officers carry when making their decisions. [4] However, this claim presumes that the input data is not biased, and many people disagree that this is the case. LASER, in particular, has been shown to have feedback loops in their policing, where the historical crime data represents arrests made by officers, not the sum total of crimes committed. This means that areas that are more heavily patrolled by officers are more likely to see increased amounts of arrests. Then, after that, officers are directed to patrol those areas in increasing amounts, leading to more arrests. This effect then compounds, causing areas with higher observed crime to be under more observation, and therefore observing more crime. In particular, Jamie Garcia states that “...historically

persistent racialized effects of state and corporate (in)actions have yet again produced disproportionate dislocation, suffering, and death." [13]

The other issue with the perceived "neutrality" of predictive policing software is that the initial seed data provided had do come from somewhere; namely, police officers. These police officers are human and come with human biases, which means that the initial data fed into the predictive policing algorithms also comes along with that human bias. Stop LAPD Spying Coalition states that LASER uses historical crime data which is a reflection of how law enforcement responds to particular kinds of crimes committed by certain subsets of the population versus a reflection of serious racketeering. [13]

Finally, it is claimed that the entire system of predictive policing can play into the so-called "prison industrial complex". Because predictive policing often utilizes a cost-benefit model that uses public data to target certain demographics, it is said to simply serve to populate our prisons providing a larger revenue for police departments, creating a vicious cycle of ever-increasing police surveillance.

Predictive Policing Benefits

Advocates of predictive policing say that it makes huge strides in maximizing and optimizing police efficiency. The Los Angeles Police Department states that their increasing uses of predictive policing to minimize crime and improve police efficiency while allowing an easier path to reach their goals. While the LAPD also states that predictive policing will provide the public with decreased likelihood of getting randomly stopped, as predictive policing allows them to target criminals and have an edge on crime before it happens.[6] Jeff Brantingham, the founder of PredPol, draws upon his anthropology background frequently in explaining how PredPol works.[4] He says that as an anthropologist, criminals can be compared to hunters, in that choosing what gas station to rob next is a lot like hunting an animal, and the same decision making processes go into these choices.

Therefore, using this knowledge as an advantage over the criminals will give police an edge when trying to predict the future actions of criminals, and using the pattern-based knowledge that PredPol provides can allow police to get a leg up on criminals, with the ability to allocate officers to the locations of potential crimes before they are even committed. Professor Brantingham claims that his theories and models are objective, which, he says, makes them blind to things like harms of allocation and harms of representation. However, Garcia counters that Brantingham's models are made from assumptions and if those assumptions are not universally true, the models Brantingham presented are futile.[13] And while Brantingham argues that his model is not objective and therefore holds no bias and provides no harms of allocations or representation, and that these types of bias can be simply considered "noise" to his data,[13] Garcia states that these models are very biased and produce social policies off of policing practices.

Course of Action: Ban of Predictive Policing

Our first possible course of action towards our ethical dilemma towards using predictive policing would be to completely stop all use of predictive policing. The Stop LAPD Spying Coalition advocates towards this course of action, calling for an immediate ban on deployment and use of policing tactics and programs such as predictive policing, as well as an immediate abolition of any current use of surveillance technology and programs. [13] This course of action has many benefits. First, putting an immediate stop to all uses of predictive policing would completely expel any allocation or representation bias presented within the Los Angeles Police Department. This, it is claimed, would help to provide an equal opportunity and level playing field for all citizens of the Los Angeles area.[13] This would eliminate any concern of bias provided by the use of predictive policing technology, though a drawback would be that it would also leave more control to police officers, who can also be biased.

However, the largest benefit claimed to completely halting any use of predictive policing is the limitation of the powers of surveillance exercised by the Los Angeles Police Department.[12] Because most of the surveillance is done without any form of warrant, it is argued that this violates the implicit right to privacy, and possibly even, in some cases, constitutional rights, as stopping people based without evidence clearly violates the Fourth Amendment, as no probable cause is had to stop the people in question. This course of action also works to prevent our data from being collected and possibly being redistributed, which acts to limit the effects of possible invasion of privacy. [13]

On the other hand, without predictive policing, the efficiency and effectiveness of police departments may decrease as they have less information available to inform them of areas of increased crime risk. This also means that the tools available to help officers decide what areas to patrol will be restricted to human intuition on crime areas, which is also noticeably affected by any racial, income-based, or gender bias of the police officers in charge of making those types of decisions. [6] Other possible effects of a ban on all forms of computer-aided predictive policing include longer wait times for officers on call, as officers are likely to be less efficiently distributed without the aid of computers. With decreased efficiency, police departments will be forced to put more officers on patrol, causing a rise in taxes to afford the increased police force. [5] Stopping all use of predictive policing would decrease the safety of the public, but greatly increase the privacy the public receives from city-level government.

Course of Action: Unrestricted Use of Predictive Policing

A second possible course of action is to continue to allow the Los Angeles Police Department to continue their use of predictive policing without restrictions on how, when, or for what purposes they use this data. Doing this would allow the Los Angeles Police Department to

continue to use predictive policing tactics to optimize the use of their police force, which will lead to the increased efficiency of use of police officer patrol time, and leading to a higher number of crimes caught with more a lower number of officers, and therefore a lower amount of funding. [5] With a more efficient police department, the residents of the city of Los Angeles would end up paying less money in taxes for their police unit, a clear benefit! However, there are drawbacks to this too: Allowing predictive policing with no restrictions would also give the police an opportunity to collect data on us and use it in any way they'd like, providing huge cautions about privacy. [13] Further, continued lack of restriction on predictive policing may allow the present biases to get worse in the future, as citizens become accustomed to increased amounts of surveillance and policing, leading to an increasingly heavily policed state. The transparency of the algorithm at play is also an issue here: Because PredPol and many similar software packages are privately developed, there can be no guarantee that their developers haven't inserted some amount of unconscious (or conscious!) bias into the results, and because the police officers implementing the software generally are not data science experts, they may be blind to any such issues that may happen to present themselves in the predictive policing software.[9] In addition, there will also still serve a bias in the system causing harms of allocations and representation; allowing the department to keep using thing's such as identity and resources as a target. Predictive policing will increase the safety of the public as police will be notified about the higher-crime areas allowing them to surround those areas using their force of being there to possibly prevent everyday crimes. [5] Allowing the police to keep such a strong record on past offenders will also make possibility of no second convictions of the same crime, keeping criminals on the track to better themselves. [5] With unrestricted use of predictive policing, their is also going to be a strong gap between the public and The Los Angeles Police Department, as the public will have ethical regards to the bias in these algorithms and how LAPD treats their data.

Course of Action: Restricted Use of Predictive Policing

The third course of action we propose is a compromise: to allow the use of predictive policing with a limited scope, and to ensure that in places where predictive policing is used, that it is not abused or used in any way that promotes any form of discrimination. This action would include measures designed to allow people to access the data that is collected about them, and to ensure that they have not been erroneously been placed on any form of watch list. Our first step of this course of action would be to create a code of ethics committee pertaining directly to predictive policing made up of a diverse group of members selected from such groups as The Stop LAPD Spying Coalition, the Los Angeles Police Department, and the general public. From there, this committee would be responsible for designing a code of ethics detailing exactly what the scope of these limited uses will be. This might include measures designed to eliminate all bias in predictive policing modeling, something that is considered a challenge but is deemed

possible. The members of this committee might form or appoint another, tasked with hearing appeals from people who feel that they have been unfairly targeted by the predictive policing system. Because they would be responsible for overseeing police justice for all residents of Los Angeles, it is very important that this group consist of people of a wide variety of backgrounds to ensure that any hearing is conducted fairly. Along with our committee and council, part of our compromise would be to make it accessible for the public to retrieve the data the police department maintains on them. This would ensure that someone who thinks they're getting treated unfairly by the Los Angeles Police Department could check what information has been collected about them, allowing them to have a better understanding of the predictive policing system, and, if necessary, to have a chance to appeal to the committee. With this course of action, we believe that the police will be able to provide a complete sense of safety while allowing the public to keep their privacy.

Least Ethical Choice: No Restrictions

In our opinion, the least ethical option for the Los Angeles Police department to proceed with is removing all restrictions on the use of predictive policing software, and allowing the police department to proceed with implementing whatever software they see fit. We believe that this could quickly lead to a dystopian police surveillance state, and that allowing unregulated power to the police departments is a dangerous decision that is highly unlikely to end well. Particularly, this can be dangerous for groups which are underrepresented and/or discriminated against. Applying the Veil of Ignorance to this situation, it quickly becomes clear that there are ethical issues with predictive policing techniques used at a large scale and especially without oversight, as for the majority of people predictive policing will have positive effects such as lower police costs, slightly higher safety rates, and similar. But particularly for people such as minorities and people with previous criminal convictions, the risks of increased targeted police surveillance without any proof of guilt can be highly dangerous, as well as removing constitutionally protected rights to the presumption of innocence until proven guilty. Therefore, applying the Veil of Ignorance labels this situation as highly undesirable. Similarly, applying the principles of Immanuel Kant to this situation says that many of the decisions made may be inherently undesirable. While stopping criminal acts is indisputably a good thing, for the amount of potential increase in benefits under predictive policing it is not worth the inherently immoral invasion of privacy and potential of racial profiling that comes with it. Looking at this situation from a Utilitarianism view, no restrictions on predictive policing would increase LAPD's utility but leave the activists and minorities with nothing. Therefore, Utilitarianism labels this situation highly undesirable as well. Since Immanuel Kant, Utilitarianism, and The Veil of Ignorance all viewing this course of action unethical in one way or another, we have decided to make no restrictions on predictive policing our least ethical course of action.

Most Ethical Choice: Compromise

We believe that the most ethical choice in this scenario is the compromise option, where restrictions, regulations, and limitations on the use of predictive policing software are put in place, but the software is still allowed to function in areas where it can cause more good than harm. We believe that this can work with appropriate transparency and large amounts of oversight both from the citizens of the areas being surveilled and from higher levels of government. Additionally, we note that as the software becomes more refined and has increasingly high levels of effectiveness, it will continue to make the cities where it is installed a safer place with lower false negative rates, and will be continually less likely to target people who are not guilty of crimes, with lower false positive rates. We think that there is a lot of benefit to be had from predictive policing software in optimizing the efficiency of the police departments of the cities where they are installed, but note that, like any data analytics system, results can be easily misinterpreted, and so it is important to ensure that police departments are properly trained on the use of the software they implement and aware of methods to identify and to counteract any bias that the system may produce. Many philosophers agree with us on this subject. Jeremy Bentham, a utilitarian thinker, for instance, would say that this provides the "greatest good for the greatest number" by optimizing the safety of most people for small invasions of privacy here and there, without major overreaches by government into the privacy of individual citizens. Immanuel Kant might disagree slightly, saying that the morality of protecting people from threats of harm is important, but that doing the right thing through the wrong methods (still potentially spying on innocent people) can counteract any potential benefit of any predictive policing at all. But again, applying the Veil of Ignorance affirms our decision, as with effective limits on the scope, reach, and power of predictive policing will remove the issues which potentially mis-targeted people may face under the system, and greatly increase the benefit for all people covered by this system.

Future Improvements

We think that this case exposes great shortcomings in several areas. We think there are vast improvement to be made in transparency of software used for predictive policing; namely, we think that any software used for predictive policing purposes should be open to regular external audit and third-party review, or better yet, open-sourced. We think that because this software will be applied to vast numbers of people without any kind of ability to "opt out", the software must be guaranteed to be fair to those to which it applies. This is in great contrast to the current state of affairs, where police departments have relative freedom to either implement their own software from behind closed doors, or choose from a selection of third-party software that was similarly created with limited to no external review process. We note that this is already

becoming a trend at the federal level, with the government providing increasing amounts of software as open source through sites like code.gov, and may even solicit free contributions of software from other parties as well.

Secondly, we think that it is important that there be legal recourse for those who are found to be held under suspicion by the software. In cases where the person is innocent, they must have the ability to notice when they are marked for increased surveillance, and the freedom, if they so desire, to effectively appeal to remove their appearance from any such list on which they appear. This, again, we think stems from the constitutional right to a fair trial, as without this measure, people can be held under suspicion for crimes they have not committed, and likely will never commit, a truly Orwellian "thought-police"-type state of affairs that we hope must never happen. Potential future guidance could possibly be taken from the Freedom of Information Act, where people who are held under surveillance at the federal level have the right to request any information which the government has about them. This allows people to have information about whether they are actually personally under any form of surveillance, and if they are, to know how and by whom and potentially have information necessary to appeal that surveillance. While the FOIA does not include any generic appeals process, it would be important that the predictive policing legislation include an easy method to appeal inclusion on any such list.

Finally, we believe that it is important to have legal regulation on the software, and to have support in effective implementation from higher levels of government. Machine learning is not easy to implement properly, and ensuring that departments small and large can combat any introduced sources of bias in their data with great effect is important. Also, it is important that there is effective regulation such that people with limited voting power don't get unfairly targeted, as it would be easy to envision a system that heavily tracks foreigners, or even visitors from other parts of the state or country, who would have no ability to protest these measures because they're not eligible to vote locally. Similarly, minorities can easily be targeted, especially in areas with histories of racial discrimination or large numbers of immigrants in xenophobic times, and we believe that effective legal regulation can ensure that implementations of predictive policing software are done in a safe, effective, and fair manner for all those whom it affects.

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