**Dosier «El derecho para una inteligencia centrada en el ser humano y al servicio de las Instituciones»**

ARTICLE

# Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement[1]

## Dr. Fernando Miró-Llinares
Full Professor of Criminal Law and Criminology, Universidad Miguel Hernández de Elche

## Abstract

The use of predictive AI tools to improve decision-making in relation to crime prevention and investigation is a reality. They are being implemented almost before we fully understand how they work, while we make legal decisions that may determine the progress of the technology, and long before we can predict their full impact. This paper addresses the attitudes towards this technological revolution applied to criminal justice, focusing in particular on its use by police. The first section summarizes and describes the techniques and technologies that make up predictive policing. Subsequently, the main part of the study analyzes how this technology has been received. This ranges from optimism from those who defend its immediate implementation as a way to improve police objectivity and efficiency, to pessimism from those who see its use as fostering a dystopia of State control and surveillance. These two extremes reflect the shift from optimism to technological pessimism in the twentieth century. The article concludes with a defense of a realistic, critical and informed view of the use of these predictive algorithms. This vision accepts that there are no neutral technologies yet does not fall into fatalism and technophobia. It is one that places the human being and legitimate policing at the centre of the algorithmic equation while redefining its objectives based on the scientific evidence applied to each individual technology.

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Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement

## Keywords

## Topic

# *Policía predictiva: ¿utopía o distopía? Sobre las actitudes hacia el uso de algoritmos de* big data *para la aplicación de la ley*

## Resumen

La utilización de herramientas de IA de tipo predictivo para mejorar las tomas de decisiones en relación con la prevención e investigación de la delincuencia es una realidad. Su implantación está teniendo lugar casi antes de que comprendamos bien cómo funcionan, mientras tomamos relevantes decisiones legales respecto a aspectos que pueden determinar el progreso de la tecnología, y mucho antes de que podamos predecir todo su impacto. El presente trabajo aborda las actitudes con las que ha sido recibida esta revolución tecnológica aplicada a la justicia criminal centrándose en particular en su uso policial. Tras una primera parte en la que se describen muy sumariamente las técnicas y tecnologías que conforman el *predictive policing*, en la parte principal del estudio se analizan las actitudes con las que ha sido recibido. Estas transitan entre el optimismo de quienes defienden su implantación inmediata como modo de mejorar la objetividad y eficacia policial, y el pesimismo de quienes ven en su uso la profundización en una distopía de control y vigilancia estatal, dos aparentes extremos que se corresponden con el tránsito del optimismo al pesimismo tecnológico del siglo xx. El artículo concluye con la defensa de una visión realista, crítica e informada sobre el uso de estos algoritmos predictivos. Un enfoque que, partiendo de aceptar que no existen tecnologías neutras, no caiga en el fatalismo y la tecnofobia; que sitúe al ser humano y a la función policial legítima en el centro de la ecuación algorítmica, redefina sus objetivos y lo haga desde la evidencia científica aplicada a cada singular técnica.

## Palabras clave

## Tema

Fernando Miró-Llinares

Universitat Oberta de Catalunya

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Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement

# Technologies of uncertain social impact

The enormous academic interest aroused in recent years by the use of Artificial Intelligence (AI) in the field of law enforcement is understandable and all the signs are that it will grow in coming years[2]. The technology promises to transform criminal justice systems, which are in such dire need of advances. Yet there are fears that such technology may undermine the basic rights on which democratic states are based. It is also understandable that the initial positions of those studying Big Data algorithms in the police and judicial spheres are highly polarized. They either tend to see AI as a big help in improving decision-making processes in the criminal justice field, or consider that AI and its algorithms widen inequalities and foster State control and surveillance. Uncertainty generates hyperbole and this technology is still under development  we do not yet know where it will lead and when. Its first practical implementations, such as predictive policing, are considered «promising» and are not yet definitive. Thus, it seems easier to be overly fearful or overly hopeful than to be realistic. Such realism will only come when we are better informed on the subject – something that will have to wait until AI is perfected and its use in the field of criminal justice becomes commonplace. Only then will we have enough data to discover whether AI is good, bad or somewhere in between. That said the knowledge may come too late because by then the technology will be in place. Put another way, AI's future impacts on society and policing are as yet unforeseeable.

This not only happens with AI and Big Data but generally reflects the dual use of technology. This is because technology developed with the best of intentions can all too easily be used for evil purposes that threaten society[3]. Faced with the emergence of these threats, scholars should theorize, imagine and try to predict its impact. Yet more is needed, to wit: (1) reflection on the aims of the technology and the rules that will regulate it; (2) the likely consequences of both technology and rules; (3) an understanding of the consequences of both technology and rules; (3) an understanding of the context in which technology is developed and the implications that this has on its design; (4) initial strategies to defend citizens' rights should the technology be misused. Such reflection needs to be public and transparent so that those who will be most affected by these technological advances can fully take part in the debate.

It is clear that the widespread use of Big Data algorithms for law enforcement may greatly affect the criminal justice system and society. Beyond the «hype» surrounding AI and predictive policing[4] (based on statistical techniques, facial recognition systems, and so on), such techniques pose a challenge for policing in the 21st century[5]. There may well be unintended consequences for both police work and for society at large[6]. This paper analyzes how the technology's emergence is seen from the theoretical standpoint, what hopes and fears the technology gives rise to and the likely key factors underlying those reactions. The main aims are to: (a) consider what stance one should take to this emerging technology; (b) grasp the grounds for optimism and pessimism. We shall then go on to draw up a normative ethical framework for the use of such technology.

# 2. A short introduction to the use of predictive Big Data in law enforcement

Although most AI driven utopias and dystopias bear on general AI and super intelligence[7], there are others that are of interest here. The latter bear on an AI that already exists – a weak AI, with automatic learning algorithms that apply pattern recognition and natural language processing to large (and sometimes not so large) amounts of data for multiple decision-making. Many of these algorithms bear on criminal justice. Predictive criminal justice consists of using algorithms to estimate future risks associated with crime related personal and/or environmental characte-

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2. Ferguson (2016; 2017; 2019).
3. Pustovit & Williams (2010).
4. Isaak (2017).
5. Weisburd & Braga (2019, p. 19).
6. Degeling & Berendt (2018).
7. Bostrom (2017).

Fernando Miró-Llinares

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement

ristics and thereby improve decision-making for crime prevention, investigation and prosecution purposes. These techniques include predictive sentencing, widely discussed as a result of the COMPAS tool[8] (this highly controversial tool will not be analyzed here) and predictive policing.

The concept of predictive policing was mired in controversy almost from the outset[9] given unrealistic expectations of «anticipating the commission of crimes»[10]. The term has become widespread in academia to refer to «the application of analytical techniques – particularly quantitative ones – to identify likely targets for police intervention and prevent crime or solve past crimes by making statistical predictions»[11]. Criminal forecasting techniques are based on statistical policing and COMPSTAT[12], drawing on the theoretical support of environmental criminology and crime analysis approaches focusing on place[13]. The forecasting techniques are based on paradigms such as problem-oriented policing[14] and hot-spot policing[15] and use historical data on where and when crimes of each type are committed, and criminals' characteristics to identify objectives (personal or spatial) of police interest. Such forecasting aims to prevent crime, to make crime less likely, and to disrupt criminal activity[16].

Broadly speaking, there are two types of predictive policing techniques: (1) those based on location and on the risks in the settings in which crimes are committed; (2) those based on the characteristics of the perpetrators. The implications of the two techniques are very different, as is their rationale. As Ratcliffe recently pointed out[17], there is a theoretical basis for predictive environmental approaches based on the idea that crime shows geographic patterns[18]. This is why a set of predictive software tools such as RTM[19] or Predpol[20] have been developed. Although their use is not yet widespread, they are beginning to be used in several US cities as part of local policing strategy even though, as Boba has pointed out[21], there is still too little evidence that these methods really work. On the other hand, there are people centered predictive techniques, known as offender-focused crime forecasting[22]. It is less developed than location based software but has also given rise to applications predicting who is most likely to commit a crime, prioritize a subject from a long list of suspects, and even assign an offender a particular rehabilitation program based on his or her personal characteristics[23]. These tools are even more controversial than place based predictive policing, not only because their real predictive capacity seems negligible[24] but also because of the huge ethical implications of using data to feed the algorithms that would be clearly biased by reason of ethnicity and/or gender[25]. Finally, there is a set of predictive techniques focusing on surveillance through images, CCTV cameras

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8. Miró Llinares, (2018a; 2018b).
9. As shown by Boba (2019) the first use of the term is attributed to William Bratton, who was Commissioner of New York Police and creator of COMPSTAT as well as COMPSTAT plus when he was chief of police in LA.
10. 10 For this reason, Ratcliffe (2019, p. 350) prefers to use the term forecasting rather than prediction, based on the argument that while the action of predicting can only result in a dichotomous response, forecasting associates statistical probability to a certain variable.
11. Perry, McInnis, Price, Smith, & Hollywood (2013, p. 1-2). Uchida (2014). A criticism of this definition as too broad and problematic in Ratcliffe (2019, p. 349). Ratcliffe proposes an alternative definition, such as "the use of historical data to create a forecast of areas of criminality or crime hot spots, or high-risk offender characteristic profiles that will be one component of police resource allocation decisions. The resources will be allocated with the expectation that, with targeted deployment, criminal activity can be prevented, reduced or disrupted".
12. On the link between the statistical innovation involved in COMPSTAT and the implementation of this type of techniques, Boba (2019).
13. Clarke (1980, pp. 136-147).
14. Goldstein (1979, pp. 236-258).
15. Braga & Weisburd (2019b).
16. Ratcliffe (2019).
17. Ratcliffe (2019).
18. See: Felson (1987); Brantingham & Brantingham (2013); Weisburd & Eck (2004).
19. Risk terrain modeling (RTM) diagnoses the spatial attractors of criminal behavior and makes accurate predictions of where crime will occur at the micro-level. On this, see among others Caplan & Kennedy (2016) or Kennedy, Caplan & Piza (2018).
20. See Brantingham, Valasik & O Mohler (2018); O Mohler, Short, Malinowsky, Johnson, Tita, Bertozzi, & Brantingham (2015).
21. Boba (2019).
22. Ratcliffe (2019). For the case of organized crime, see Larsen, Blanco, Pastor, et al. (2017).
23. For heat lists and similar systems for calculating the risk of individual persons such as Beware, see Degeling & Berendt (2018).
24. Ratcliffe (2019)
25. Ferguson (2017), Noble (2018).

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement

and facial recognition techniques, movement recognition, license plate reading. This data is combined with machine learning algorithms to supposedly identify suspicious subjects, or even predict crimes before they happen[26].

The police use some or all of these techniques (especially spatial ones) to attempt predictive policing –a technique that is still in its infancy. Basically, its use is still confined to some US cities[27]. Its advocates pin high hopes on such techniques to cut crime. Its detractors argue that it gravely threatens citizens' rights.

# 3. On the extremes: views on the impact of Big Data and AI on criminal justice

## 3.1. Old attitudes for new technologies

As mentioned earlier, the advent of predictive Big Data in law enforcement and its possible use at police level has given rise to some radical visions, both optimistic and pessimistic, regarding the social impact that such technology will bring. It would be a mistake, however, to think that these strong reactions stem from the technology under development. Although it is obvious that these polarized views arise from the expected impact of the technology, they can also be seen as symptomatic of a stark polarization in views on technology in terms of either 'good' or 'evil'. This is a trend that began in the nineteenth century

in the wake of the industrial revolution and continues to this day. Put simply, it can be framed as the dichotomy between «technology, the engine of Mankind's progress» and «technology, the destroyer of individual liberties».

Indeed, there is a vision –inherited from the nineteenth century– that links technology and science[28] and technology and social progress[29]. As Segal pointed out at the end of the last century, technological utopianism is built and transmitted by visionaries and futurists, among whom the author includes Alvin Toffler, Bill Gates, and Nicholas Negroponte. These predict a bright social future thanks to technology and are believed by millions of people as their statements are optimistic, simple and boil down to ideas such as: technological development will make us better, happier, more efficient and more democratic than before and we should not worry about experience with previous technological changes because the coming revolution is so great that everything will be different[30]. Perhaps that vision is somewhat naïve regarding technology, something like: «progress without negative consequences»[31]. This is the result of the idea of the neutrality of technology and a belief in the existence of a direct correlation between technological evolution and social progress. From this arises the opposite view, which sees technology as something non-neutral that serves to dominate others and to maintain the status quo[32].

As McGuire has rightly pointed out[33], the less desirable social consequences of industrialization in the 19th century and later on, and the impact of scientific developments in two world wars[34] made earlier, idyllic visions of technology much less credible. Furthermore, the pessimistic vision

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26. Ferguson (2017).

27. For a series of recommendations on the use of these strategies by practitioners at the national level see Akhgar, Saathoff, Arabnia, et al. (2015).

28. As Franssen, Maarten, Lokhorst, Gert-Jan & van de Poel, Ibo (2018) have pointed out; against the vision of philosophers such as Simon (1969), or Skolimowski (1966); Bunge's (1966) vision of technology as applied science has prevailed, according to which there are differences between them not in their origin but in the result: technology is action, but deeply supported by theory, which would put it at the height of "the scientific".

29. See: Segal (2005, p. 172 & ff.). The original: Segal (1995).

30. Segal (2005, p. 173).

31. Segal (2005, p. 174 & ff.). In this sense, what Segal is asking for is a healthier "ambivalence" with respect to what we believe technological progress will suppose, since history shows us that it has also had negative or, at least, questionable consequences.

32. In general, on critical vision see Leckie & Buschman (2009), and especially the introduction, John Buschman & Leckie (2009, p. 1 & ff.), where the authors make an interesting and profound summary of many of the critical positions on technology and its implications.

33. See on this, and very particularly in relation to its relationship with crime and justice, McGuire's interesting analysis (2011, p. 13 & ff.), and for a broad and coincident perspective on the critical considerations Feenberg (1991).

34. This, as Verbeek (2005) points out, could have had a decisive impact on that pessimistic vision of technology that, in addition, treats it as a holistic whole without differentiating between its different specifications.

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement

embodied in important critical philosophical developments emerged mainly from Marxism and the Frankfurt school. The fundamental critical idea, which was developed differently by, among others[35], Marcuse[36], Habermas[37], Heidegger[38], Ellul[39] and later on by Feenberg within a similar socialist ideological framework but with greater critical reach, consists in denying the neutrality of technology. This question, implicit in Weber's pessimism on the instrumentalizing iron cage of rationalism in which Capitalist society was trapped[40], supposes that technology is something more than an ideology free instrument and that as such, it constitutes a substantive social force that occupies society and transforms it[41]. Under this view, it «sustains and improves the lives of individuals while subordinating them to the masters of the apparatus»[42]. It is a new cultural system that restructures the whole social world as an object of control that will serve to further embed the «imperialism of instrumental reason»[43] and against which there is no other escape than retreat in the form of a return to tradition or simplicity[44].

This general pessimism (or even fatalism, Ellul and Mumford being cases in point[45]) on the social implications of technology served The Frankfurt School and post-Marxist thought to highlight the existence of ideology behind technology, either in general to maintain the system, or especially to impose social control. Technology was thus seen as a force used by the system to watch and to coerce individuals. Under this view, scientific-technological developments that appear to be neutral are in fact part of the system of social coercion[46]. In this respect, technology already played a key role in the culture of control and in particular in the growing trends of State surveillance[47], giving a foretaste of what was come. That is why some argue that predictive Big Data will lead to a dystopia of surveillance and control. Let us look at both visions.

## 3.2. The utopia of anticipating crime through predictive policing

A utopia must both: (1) be something that is not yet possible; (2) enshrine a desire or will for it to eventually occur, based on the belief that it is a good thing. In my view, there is something utopian in the vision of AI algorithms as tools for forecasting earthquakes, and lessening the number of fires, deadly diseases and crimes. The use of the computational and correlational power of machine learning tools to do what the 'pre-cogs' in the movie Minority Report[48] did, namely to foresee crimes in time to stop them happening[49] clearly lies in the realm of Science Fiction. Yet for many it is something desirable and to which one should aspire. That is why technology such as predictive policing is greeted with such enthusism. Although it cannot (and may never) predict the perpetration of crimes, it helps identify the likelihood of future events based on better knowledge of previous events and their conditioning factors. It thus

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35. For a complete study of all critical positions see Feenberg (2002).
36. Marcuse (1964).
37. Habermas (1970).
38. Heidegger (1977, p. 17 & ff.).
39. Ellul, (1964, p. 31 & 22).
40. Weber (1958, p. 180 & ff.).
41. Heidegger (1977, p. 18 & ff.).
42. Marcuse (1964, p. 166). In any case, perhaps the most pessimistic view of the influence of technology, as Feenberg has pointed out (2002, p. 7), is that of Ellul, for whom "this system is characterized by an expansive Dynamic that ultimately overtakes every pretechnological enclave and shapes all social life. Total instrumentalization is thus a destiny from which there is no escape other than retreat. Only a return to tradition or simplicity offers an alternative to the juggernaut of progress"
43. Thus Weizenbaum (1976, p. 259), in particular regarding the impact of information technology, in an era that today seems almost preinformation technology to us, advances that the opacity of information systems would lead to people intertwining them even more with their lives.
44. Thus, with regard to the approaches of Heidegger and especially of Ellul, see Feenberg (2002, p. 6 and 7).
45. Who, in the catastrophic line of Ellul, the technology, especially for its unstoppable tendency to expansion, supposes a threat even for the extinction of the society (Mumford, 1991, p. 17 & ff.).
46. Mcguire (2011, pp. 195 & ff.).
47. Lyon (2010).
48. Edwards (2017).
49. Van Brakel & De Hert 2011

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms
for law enforcement

allows the adoption of preventive strategies for avoidance, reduction, or mitigation purposes[50].

In reality, the utopia of anticipation is only an amplification of the perfectly understandable optimism over the 'scientization' of these activities[51]. The benefits of technology also go beyond crime prevention, for instance in more efficient management of police resources[52] and less subjectivity in police decision-making. The ability of algorithms to process large amounts of data[53] allows them to evaluate more information more quickly than any officer, crime analyst or individual department[54] ever could. At a time of growing public demands for fairness and responsibility, this becomes a value in itself[55]. In addition, these tools could correct human bias by overcoming the discriminatory treatment historically suffered by various under-represented groups[56]. The enthusiasm is even greater when it comes to predicting Internet crime – a field of immediate digitization where data correlations could help predict events and thus facilitate preventative and mitigation measures[57].

These optimistic attitudes and beliefs in the AI utopia camp have consequences and can end up shaping key political and social decisions. The utopian vision, described by Salecl as excessively optimistic[58], enshrines a consensus on the goodness of these technologies that begins with the legitimization of their aims and then the means needed to achieve them. The end result may be a legitimization of a paradigm shift in many areas such as the implementation of this technology for police, and judicial intervention for the investigation and prevention of crime

and its consequences. In fact, some of the enthusiasm is being vindicated by the success of tools now used within this broad spectrum of predictive policing. In 2013 Perry reported growing police use in many American cities of these technologies and, in particular, of algorithms based on Big Data for decision-making[59]. Broadhust and colleagues highlight data from the Police Executive Research Forum, which in 2014 found that 38% of agencies use predictive surveillance methods[60]. In addition, a recent survey among police forces in The United States showed that over 70% planned to use this kind of technology within the next two to five years[61]. Were this to be the case, today's fanciful utopia would for good or ill become the commonplace of tomorrow[62]. The prediction that the police of the future will use AI to predict crimes could become a self-fulfilling prophecy, with the use of algorithms becoming legitimized to all practical intents and purposes, fostering an all-out effort to boost the their predictive power. It is not clear whether this would cut crime, eliminate discrimination or establish a new model of policing based on early intervention grounded on the forecasts made by algorithms and subsequent correction of their errors. There is no general consensus that such developments would be good for society.

### 3.3. he dystopia of surveillance and inequitable control through police AI

Utopia and dystopia share the belief that what the future may hold has yet to arrive but differ as to whether it is desirable or not. Dystopia goes beyond merely a «negative vision» of that future to enshrine the belief that such a

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50. In this sense, Bennett Moses & Chan (2018) state ''such positive beliefs around predictive policing are often based on a mythological and unrealistic view of actual capabilities and practices''.
51. Smith, Bennett Moses & Chan (2017).
52. Isaak (2017).
53. Which can be seen in the sentence Farivar (2018, p. 11) attributes to Paul Rosenzweig, high-ranking official in the US Department of the Interior 2005-2009: "I believe in Big Data. I believe that large scale aggregation changes our ability that one plus one plus one can equal 23".
54. Joh (2017).
55. Isaak (2017).
56. On how software influences decision-making in this regard, see Eubanks (2018). See also Isaak (2017)
57. See, for example, Burnap & Williams (2015).
58. Salecl (2019, p. 72).
59. Perry et al. (2013)
60. Broadhurst, Maxim, Brown, Trivedi & Wang (2019).
61. Robinson & Koepke (2016).
62. Edwards (2017, p. 6)

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement

society would be loathsome. That is why dystopias, both when they take the form of cultural development and when they are more academic-philosophical thought experiments, generally sound warnings or reveal critical visions of today's world that serve to rethink the uses of the present and try to prevent the nightmare becoming reality. The traditional AI dystopia is that of robots destroying or subduing the human race. Yet there is another scenario that is both less apocalyptic and more likely to come about. It concerns machine-learning and of a society dominated by algorithms developed for the surveillance and coercion of the individual[63] by the State[64].

Those who envisage dystopia highlight how we are all contributing to it. As Ferguson pointed out, every time we interact with computers, sensors, smart phones, credit cards, etc., we leave a fingerprint that reveals things about us that are of value to others[65]. This information feeds into decision-making algorithms that affect almost every area of our daily lives[66]. This means public and private institutions are better able to watch our every move and deed and thus control us in ways that suit their interests. Furthermore, there is the chance of creating decision-making tools that, although supposedly neutral, will at best simply reflect existing inequalities[67] and at worst seek to maintain existing power dynamics. These observations lead to the fear that the spreading adoption of these tools merely serves to maintain and strengthen a status quo based on inequality, control and surveillance in which individual freedom is sacrificed to the interests of the powerful[68].

Within the general fear regarding discriminatory use of AI, there are worries that the powerful could use it to control society unless sufficient ethical controls are introduced. The dystopia of the precognitive police encapsulates this fear. Here, the police ruthlessly act to stop a crime before it can be committed[69]. To achieve this seemingly impossi-

ble feat, the police draw on data covering past events – information that is controlled by the police and the public authorities. The dystopia of a police force that arrests and watches over those who are only guilty of 'thought crime' and of a criminal justice system that harshly punishes them is the stuff of several SF movies. This is the most extreme vision of a more mundane and immediate fear, that of the misuse of predictive algorithms by the police and criminal justice system, and that are based on geographical or personal police data as well as on real-time images captured by myriad surveillance cameras. It could be said fear of this less dystopian version has spread greatly both in the media and in academe.

We could say that there is a general fear of such techniques, and a more specific fear spawned by that more abstract concern. The broader fear is of State control and surveillance, and it is strongly linked to the huge growth in data on every aspect of our daily lives and the chances that all this information will be used by the police. In particular, there is concern that existing technology (such as CCTV cameras) may be used for purposes other than the investigation of crime or for deterring wrongdoing (which is basically how they have been used so far). Here, I refer to the police using CCTV for real-time surveillance combined with AI technologies such as facial recognition or movement recognition. In particular, police are using facial recognition technologies to scan crowds to identify potential terrorists, based on those who have a police and/or a criminal record[70]. This, however, may be just a foretaste of what the future holds. The sum of CCTV surveillance, facial recognition techniques, police data and Big Data by means of AI represents a qualitative leap in terms of control. The huge volumes of data would shape police decisions regarding on whom to stop and demand identification. There is already a vast body of literature on present

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63. 6O'Neil (2016), p. 3.
64. On these issues see in depth Valls Prieto (2017). See also Lyon (2010).
65. Ferguson (2017, p. 9).
66. Angwin (2014).
67. Wachter-Boettcher (2017, p. 119 & ff.).
68. O'Neill (2016). Also, Wachter-Boettcher (2017, p. 145) point out that the disconnect between the amount of power that the algorithms used in everyday life have over our lives compared to how little we know about them can only cause fear.
69. For example, Isaak & Lum (2016)
70. Surden (2019).

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms
for law enforcement

biases and discrimination[71], and databases would be fed with real-time data that would enable the use of more complex statistical techniques employing self-learning algorithms. This would, supposedly, fill gaps that we cannot see. Our faces, the way we move or the way we interact on the Internet would become valuable information used by the police for purposes such as crime prevention, forcing us to relinquish our privacy rights. The potential of AI to create much more powerful and reliable predictive tools would thus put privacy at risk and be the perfect excuse for all-pervasive control and surveillance in both physical and cyber public spaces.

Another fear is that police will use the greater scope for surveillance and control in a biased, discriminatory fashion[72]. The main reason is the kind of data used by police and criminal justice for the assessments that would feed into predictive or risk assessment algorithms. Thus, some authors have high-lighted the fact that the kinds of data used for some of the best-known statistical prediction tools for crime, disorder, and anti-social behavior do not spring from easily logged natural phenomena (unlike, say, the weather) but merely from social events «that must be perceived, observed, collected, classified and recorded»[73]. There is sufficient evidence that this is a complex process which, as recent predictive policing studies have pointed out, is «highly influenced by the crimes that citizens choose to report, the places that the police patrol, and how the police decide to respond to the situations they encounter»[74]. The result is data that have been described as «notoriously suspicious, incomplete, easily manipulated, and plagued by racial prejudice»[75]. For that reason, and according to a vision that the authors describe as realistic (but that is highly pessimistic), police use of these tools will only serve to widen inequality. Among other things, this is because the seemingly objective nature of these tools could simply mask discrimination[76]. That is because algorithm-identification links are not the

product of reflective analysis but rather of statistical associations that may well be casual rather than causal. The dangers posed by such techniques in the police and criminal justice system are all too clear[77]. As Peeters and Schuilenburg have pointed out, the specific threat posed by risk assessments and police use of algorithmic tools is that the results are not discussed, as they do not present arguments or reasoning but are taken as automatical-ly-generated gospel truth[78].

## 4. Away from the hyperbole. A realistic, critical and informed view of the police use of Big Data algorithms.

In principle, it is easy to take a stance that is somewhere in the middle, far removed from the two extreme positions regarding police use of Big Data and AI tools. It is not hard to distance oneself from the idea that AI will be the panacea for decision-making and that the use of this technology will improve policing by statistically predicting where, when and who is most likely to commit crimes (among other things because there are too many sides to crime to hope for objective, unbiased event prediction). Likewise, it is easy to reject non-use of AI and Big Data, especially in the field of policing and criminal justice – an argument based on the notion that such technologies will be a weapon in the hands of the powerful to discriminate even more against society's underdogs. It is naive to believe that technology with so much potential is not going to develop in many areas, including the police, and that these technologies can be replaced by the traditional decision-making approaches used hitherto. Furthermore, a fatalistic attitude to putting technology into practice does nothing to shape design decisions to ensure that implementation takes the right direction.

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71. Gelman, Fagan & Kiss (2007); White & Fradella (2016); Richardson, Schultz & Crawford (2019).
72. Sheehe (2019).
73. Joh (2017).
74. Robinson & Koepke (2016).
75. Edwards (2017).
76. Peeters & Schuilenburg (2018).
77. Clear & Frost (2014, p. 16 & ff.) speak of a new punitive approach disguised as objectivity and empiricism. Similarly, Brandariz García (2016).
78. Peeters & Schuilenburg (2018).

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement

However, it is much harder not to sink into over-simplification in 'The Middle Ground'. Striking the right balance between: (1) a positive attitude towards the use of technology (which could advance criminology and police effectiveness), and (2) fear of much greater threats to constitutional rights from the State. This tension is present in many social and technological developments but it is more strongly evident here. The tension is heightened further by the fact that we are still dealing with an emerging technology and are thus better placed to define and limit its progress – should we so choose – or to vastly extend its scope. We can start from one of the following two premises: (1) that we still lack sufficient evidence on the impact of preventive policing systems and the implementation of algorithms for assessing policing-related risks or even AI for the spatial prediction of crime[79]; (2) we have the chance to implement these tools and/or to support their funding and development. Which premise should guide our choice? The answer lies in the philosophical discussion on technological neutrality and caution.

The discussion on the supposed neutrality of technology is largely outdated insofar as most philosophers in the field agree that technological development is basically goal-oriented. That is to say, «that technological artifacts, by definition, have certain functions, and can be used for certain purposes but not, or with much more difficulty or with less effectiveness, than for others»[80]. This being so, it seems clear that technology is not neutral but rather can be functionally defined through certain purposes, interests and even ways of seeing and valuing the world. Its development possibilities are situated within that framework, so that a mere adaptation would not lead to a change in its functions and a redefinition of its objectives would probably lead to a change in the technology. Here, Marcuse might be right in affirming that «technological rationality has become political rationality»[81] where one can argue that the instrumental rationality behind a technology is framed within a specific ideological vision. Thus, when an AI algorithm is designed for risk assessment in the criminal justice system or for predictive policing, this is not done in a vacuum. Rather, the problem is approached from a certain instrumental conception of the goals of criminal justice, which in turn tie in with the culture of control[82] and with police measures to prevent crime.

Accepting that the very design of technologies and the procedures based on them (such as AI or predictive policing) incorporate given social values does not necessarily imply succumbing to fatalism – a point made by Feenberg[83]. Recognition of all the defects and risks entailed by the use of technology serving State control and surveillance is no excuse for technophobia. We may grant that facial recognition and other techniques (such as geospatial analysis) rest on existing structural inequalities. Yet this is not good enough reason to reject new practices out of hand and to defend a return to thumbing through paper files in some basement. Turning back the clock is not the answer[84]. In my opinion, it is a much more constructive to grasp all the objectives and interests behind each technological development[85]. Furthermore, we should separate politics and ideology whenever possible and deeply reflect on ethical issues to redefine the aims of the technology even if this means transforming it and picking apart the algorithms.

This position might be termed 'ethical instrumentalism' inasmuch as it accepts the scope for orienting technology (even redesigning it) to meet certain goals. Yet at the same time it recognizes the need to take into account the social context in which technology is developed, pursuing a more humane vision in which individual freedom is not

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79. What Ferguson (2017, p. 72) calls the million-dollar question and that he also considers to be unanswered: whether predictive police systems really work or not.

80. Franssen et al. (2018).

81. Marcuse (1964).

82. Garland (2002).

83. Feenberg (2002, p. 14).

84. Feenberg (2002) says a critical position that does not commit errors can agree with instrumentalism in "not despairing before the triumph of technology".

85. Because, as Amoore & Raley (2016) say, algorithmic systems are in fact not inscrutable, and that the calculative modalities that inform their programing can be examined.

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement

trampled on in the fight against crime. In my view, this dovetails with the development of philosophical reflections on technology in the second half of the twentieth century. As Pleasants, Clough and Miller have rightly warned, current thinking on the issue is characterized by three key features. These are: (1) the shift away from technological determinism and the assumption that technology is a self-contained, inevitable phenomenon that develops of its own accord; (2) the ditching of global solutions to ethical reflections on technology and the embracing of ethical ponderings on given technologies and stages in their development; (3) the empirical turn, «the tendency for the ethics of technology to be based on adequate empirical information, not only on the exact consequences of specific technologies but also on the actions of those involved in their creation and development»[86]. I believe that our approach should be based on these ideas. Artificial intelligence and Big Data algorithms for policing are not given and self-defined. Neither are they impervious to change. It therefore makes no sense to adopt a «take it or leave it» attitude to these technologies. By the same token, the technologies are not wholly neutral but are rather tools defined within a socio-political context. One should recall that certain goals are set for the tools. Hence the need to reflect on the ethical issues posed by such tools and on the functions offered. All this should be done with empirical knowledge of how they are constructed, how they work, with discussion of their theoretical bases, their effects, and so on.

This attitude might be described as realistic, ethically critical and empirically informed, and is the one we should take regarding the use and development of AI tools and Big Data algorithms in policing and the criminal justice system[87]. Taking a realistic attitude towards police use of AI and Big Data algorithms means recognizing that we do not «know» but only «assume» what these technologies and their implications are[88]. It also means weighing up their current capabilities as our starting point and considering kindred developments[89], and the

potential consequences of both. One also needs to take contextual conditioning factors into account to normatively determine their design and social implementation. The attitude is a practical one for assessing how well a given technology meets the goals set for it. Here, success goes beyond the metrics of policing practice (number of arrests, lower crime rates, etc.) and bears on society as a whole. Thus views on how 'good' or 'bad' the technology is should take into account the social ethical values enshrined in our Constitution. Such values (for example, privacy, human dignity) may be positively or negatively affected by technology. That is why we must analyze what is at stake and ensure that the ethical decisions we take are reflected in the technological design. Thus, real utility (both now and potentially in the future) should determine the goals before a technology is put into practice. Yet this ethical utility is a much broader issue than preventing crime and ensuring public safety. Accordingly, it must be understood within the frame of a democratic State in which basic rights and freedoms are upheld.

The aforesaid realistic attitude thus assumes a critical approach that is ethically rather than ideologically based. One cannot hope to fully understand and value a technology and its implications while ignoring its defects and limitations, its less explicit purposes, and the harm that may arise from its use. Only by recognizing the social positions and power structures from which technology springs can we identify its objectives, grasp the meaning of its design, and make changes. As Verbeek has noted, if technological design responded better to the needs of the end user and the needs of society, perhaps many harmful consequences could be avoided[90]. This is precisely the purpose of the critique proposed here, namely to understand technology and adapt it to society's real needs as defined through democratic debate. It is not only a question of understanding but of acting. That means ditching fatalism, technophobia, and the unfounded skepticism they spawn. Endlessly arguing that a new techno-

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86. See, with multiple references from each of the authors and the different positions on the subject, the excellent summary analysis by Pleasants, Clough & Miller (2019).

87. Miró Llinares (2018).

88. Popper (1959).

89. Similarly, Surden (2007, p. 1306) highlights the need to adopt a realistic attitude but avoiding futuristic visions to focus on the implications of the technology that exists or that soon will.

90. Verbeek (2011).

Fernando Miró-Llinares

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms
for law enforcement

logy is unproven or that the empirical process behind it is driven by interest groups is a cop-out that takes us nowhere. Hence the need to shift away from those critical visions that simply ignore empirical impact assessments. As McGuire has rightly pointed out, while there are grave doubts that Science can validate a technology's use or 'goodness', the dystopian idea that science somehow delegitimizes technology is equally indefensible. As McGuire states: «there is nothing in the scientific method itself that automatically renders the use of technology as a criminal justice tool technocratic»[91].

That is why the last key element of the attitude proposed here on the use of AI and Big Data is that it be empirically informed. It may seem blindingly obvious but both those adopting an over-optimistic attitude to tech and those who see technology as a Pandora's Box should be wary of the constant stream of disinformation on key aspects of these tools, their scientific assumptions, and their consequences. Although I will return to this later, the utopian vision takes the effectiveness of these tools for granted without saying whether they have been reliably verified[92]. It generally assumes the validity of the data from which it starts and does not ask if they are biased or how they were gathered. On the other hand, the dystopian vision tends to treat technology as an abstract whole and when «the empirical turn»[93] takes place, it is discovered that not all technology has the perverse effects expected[94]. In particular, pessimism on predictive policing techniques often takes data misuse for granted and/or over-looks the scope for using computer tools to remove some of the biases[95]. It is also obvious that human biases will persist when it comes to decision-making. Knowing more about these will set us on the path to taking the right decisions.

In the face of all this, it is vital that scientific development of a technology such as AI and its use in policing should be based on the broadest possible knowledge. This begs the question of how one can evaluate these tools when they are already evolving so fast that we cannot know their impacts. One of the traits of scientific and technological development over the last few decades is the sheer speed of change, something that is stark in the ICT field. Algorithmic developments based on Big Data and AI have happened so fast that they have greatly outstripped normative reflection on where they should go. This has also happened in predictive policing: first it was the creation of the technology and its implementation in decision-making tools such as Predpol in the US. Ethical reflections only came once the algorithms were in place[96]. Given that the same thing can happen again in this field, the realistic, critical and informed attitude defended here would require a double scientific review: one prior to implementation of the technology and one afterwards. The exante assessment requires rigorous scientific analysis of: (1) the technology and the empirical and theoretical foundations on which it is based; the social data underpinning it; the interests and perceptions of the community where it will be applied[97], and; (2) an evaluation of the potential impact it may have on citizens' rights and free-doms. Depending on the severity of the potential impact on stakeholders, one may need to demand a review of the scientific basis, the imposition of legal limits before the technology is put into practice, or even ban its use. Once the technology is in place, the demands for evaluation will be replaced with demands for transparency, democratic involvement, ongoing assessment, and the reversibility of the technology. A sensible attitude to launching a technology that is still under development and who main implications are unknown is to demand constant monitoring of implementation and its effects. Such evaluation should be broadly based, as will be argued later. It also means: (1) ensuring greater

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91. Mcguire (2011).
92. Ferguson (2017).
93. Kroes & Meijers (2000).
94. Pleasants, Clough, & Miller (2019). The authors point out that even from critical constructivist positions when empirical research has been carried out on specific technologies, it has been seen how they influence and allow actors to lead important social changes.
95. Nevertheless, as proven in other fields, the technology can also be trained not to reproduce discriminatory biases. In this sense, see Thomas, da Silva, Barto, et al. (2019).
96. Ferguson (2017).
97. Lepri, Oliver, Letouzé, et al. (2018).

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms for law enforcement

social participation by citizens in decision-making[98]; (2) that the technology be reversible and closely tailored to people's needs.

There is one final consideration regarding attitudes on the use of AI and Big Data algorithms for «predictive policing» purposes. It is that full social and criminological appraisals should be made before applying a given technology to policing and crime prevention/research. Here, one needs to thoroughly grasp the nature of the police and their policing.[99] It is striking that many of the tools being developed in the field of police use of AI and Big Data, and in academic or professional projects using machine-learning, are undertaken by people outside the police world. They have no social knowledge about policing and its implications or about crime as a complex social phenomenon. Rather, they focus on creating «products» to prevent crime, optimize resources, and so forth. This is so because developing AI requires deep knowledge of computer science and statistics – something that most people working in the policing and criminology fields lack. Yet a more trans-disciplinary vision now seems to be taking root, with the Social Sciences playing a greater role. Without such a multi-disciplinary approach, it is unrealistic to expect the creation of effective tools. The danger is that we will end up with a simplistic view of criminality and thus come up with equally superficial technical 'fixes'. The antidote is a thorough grasp of biases, including those covering race and gender. Failure to understand the real scope of the theoretical frameworks carries the risk that we will wrongly equate a drop in crime rate with successful implementation of the technology.

In my view, there is an even more pressing need to grasp the intrinsic and extrinsic characteristics of policing if we are to successfully implement these crime-reduction technologies. Predictive policing is only part of a much more complex reform of law enforcement that goes beyond the technological and began decades ago[100]. For example, one needs to start with «the police» to understand what technological tools can be applied, what kinds of data ought to be used, and the form they should take. When a realistic, critical and informed attitude is adopted to the use of AI and Big Data tools in policing and/or crime prevention/investigation, technology cannot be the central plank. This role must be played by police criminal policy. Only thus will it be possible to determine what technology should be used, the form that makes most sense, and what policies it ties in with. This needs to be complemented with other measures based on a thorough grasp of: (1) policing skills, capabilities, and practices; (2) the data underpinning policing decisions and how such data are gathered, coded and analyzed; (3) police practices in the real world; (4) the limits to police action and legal guarantees; (5) criminal policy goals; (6) the community and social contexts.

The implementation of new technologies and police statistical prediction practices must go hand-in-hand with holistic and transparent approaches to community policing. Such a strategy will ensure stakeholders' interests are fully understood, minimizing resistance, thereby boosting the chances of project success[101]. Here, one needs to recognize that the social engineering solutions proposed will vary depending on the problem studied[102]. Such an approach is wholly compatible with adopting a criminal policy vision on the use of technologies within the broad police sphere, in which diagnosis should not be confused with solutions. Rather, the idea is for the police to find specific solutions for each problem, accepting the fact that the police cannot solve all social problems but can help with some of them – especially if they have the right approaches and tools for the job.

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98. Thus Pleasants, J, Clough, M.P, and Miller, G., "Fundamental Issues...", ob. cit., point out that, at the very least, people should be aware of how others' perspectives on technology shape their individual and social decision-making.
99. In that sense, and deeper, Ferguson 2019.
100. Benbouzid (2018).
101. Hustedt (2018).
102. What Clarke (2018), referencing Popper, called "piecemeal social engineering".

Fernando Miró-Llinares

Universitat Oberta de Catalunya

www.uoc.edu/idp

Predictive Policing: Utopia or Dystopia? On attitudes towards the use of Big Data algorithms
for law enforcement

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Universitat Oberta de Catalunya

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### About the author

Fernando Miró-Llinares
f.miro@crimina.es
Full Professor of Criminal Law and Criminology, Universidad Miguel Hernández de Elche
Director of the CRÍMINA Center for the study and prevention of crime