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SEEKING COMPATIBILITY IN PREVENTING CRIME WITH ARTIFICIAL INTELLIGENCE AND ENSURING A FAIR TRIAL *

by

KELLY BLOUNT**

The justice system is increasingly reliant on new technologies such as artificial intelligence (AI). In the field of criminal law this also extends to the methods utilized by police for preventing crime. Though policing is not explicitly covered by Article 6 of the European Convention of Human Rights, this article will demonstrate that there can be adverse effects of policing on fair trial rights and make the analogy to criminal investigations as a recognized pre-trial process. Specifically, it will argue that policing that relies on AI to predict crime has direct effects on fair trial processes such as the equality of arms, the presumption of innocence, and the right to confront the evidence produced against a defendant. It will conclude by challenging the notion that AI is always an appropriate tool for legal processes.

KEY WORDS

Artificial Intelligence, Fair Trial, European Convention on Human Rights, Predictive Policing

* Kelly Blount is a doctoral researcher of criminal law, supported by the Luxembourg National Research Fund (FNR) (PRIDE15/10965388)

** She may be reached at kelly.blount@uni.lu; University of Luxembourg, Luxembourg.

1. INTRODUCTION

A reliance on artificial intelligence (AI) to support judicial procedures has expanded into wider applications of criminal law and extends increasingly into crime prevention. Just as AI is advocated as streamlining trial processes, its proponents claim that its use for policing may promote more effective crime control and efficient management of police resources. This article argues that though much of policing occurs outside the official scope of pre-judicial processes, the fair administration of an adversarial criminal trial is directly affected by policing practices supported by the use of AI.

The article will progress this argument in two parts. the first part will describe the integration of AI into crime prevention, namely through the practice of predictive policing. This section will identify and describe some of the attributes of predictive policing that due to the integration of AI, may cause a fairness deficiency for criminal defendants in later trial processes. It will be demonstrated that some characteristics of predictive policing may alter generally accepted practices, such as by increasing bias and weakening the standard of reasonable suspicion. The second part of the article will address how the previously described effects may have the consequence of obscuring the clarity of trial procedures, specifically hindering the equality of arms and the presumption of innocence. This section will conclude by determining that using AI for the prevention of crime is not necessarily incompatible with the notion of a fair trial, but that the current practice of prioritizing technological efficiency over procedural rights presents clear dangers to the application of criminal justice.

Finally, this article will offer the observation that judicial processes are normatively affected by technology at both the policing stage as well as in subsequent criminal proceedings. the interplay of numerous police processes determines the circumstances in which an arrest is appropriate, whereas it is the role of the court to determine when the elements of an offense are met. Further, it will posit that the use of AI for preventing crime upends these processes and proves incongruous with the causality centered nature of criminal law.¹ The article concludes with the suggestion that by hastily inserting AI into police and trial practices which are not

¹ Quattrocolo, S. (2019) An Introduction to AI and Criminal Justice in Europe. *Revista Brasileira de Direito Processual Penal*, 5 (3), pp. 1519–54 p. 1526.

designed to accommodate the increasing role of technology, we inadvertently redefine the law and our relationship with the judiciary.

2. PREVENTING CRIME WITH AI: PREDICTIVE POLICING

The use of AI for legal and procedural processes is not at all novel to the field of criminal law. Many criminal justice systems have incorporated the automation of these processes to assist decision making, namely in the form of risk assessments. Examples of their use span from the Ministry of Justice in Estonia,² to determining recidivism in Canada.³ Similarly, the United States has become quite advanced in its use of automated decision making for processes such as setting bail and determining criminal sentences.⁴ Subsequently, the shift toward predictive policing is a logical next step in better streamlining legal processes that affect criminal justice from the early policing stage.

Predictive policing is the *use of historical and real time data to forecast⁵ the risk that a location or individual is likely to be the center of a crime event, to which police agencies may choose how to purposefully divert their resources, in lieu of some other unknown threat.*⁶ The term has become notorious for its use in the United States, where large jurisdictions such as New York City and Los Angeles are subject to policing by algorithm via companies like PredPol and Palantir.⁷ Its use is also increasing in the United Kingdom, France, the Netherlands, and Germany with ongoing testing and implementation of predictive policing programs.⁸ The methods used

² Niiler, E. (2019) Can AI Be a Fair Judge in Court? Estonia Thinks So. *Wired*, 25 March.

³ Christian, G. (2020) Artificial Intelligence, Algorithmic Racism and the Canadian Criminal Justice System. *Slaw*, 26 October.

⁴ Kehl, D. et al. (2017) Algorithms in the Criminal Justice System: Assessing the Use of Risk Assessments in Sentencing. Harvard Law School: Berkman Klein Center for Internet & Society, pp. 13-15.

⁵ Forecasting is a scientific term (indicating reproducible and objective). Prediction is a more colloquial term also utilized by law enforcement. No distinction is intended between the terms in this article. See Perry W. et al. (2013) *Predictive Policing: the Role of Crime Forecasting in Law Enforcement Operations*. Santa Monica: RAND Corporation, p. 1.

⁶ Hardyns, W. and Rummens, A. (2018) Predictive Policing as a New Tool for Law Enforcement? Recent Developments and Challenges. *European Journal on Criminal Policy and Research*, 24, pp. 201-18, p. 200-215; see also Jansen, F. (2018) Data Driven Policing in the Context of Europe, Working Paper. Cardiff University: DATAJUSTICE, 7 May, pp. 7-8; also, Ferguson, A.G. (2017) Policing Predictive Policing. *Washington University Law Review*, 94 (5), pp. 1109-1189 p. 1125.

⁷ Haskins, C. (2019) Dozens of Cities Have Secretly Experimented With Predictive Policing Software. *Vice*, 6 February.

⁸ Jansen, F. Data Driven Policing in the Context of Europe, pp. 7-8.

in Europe differ from their American counterparts, in large part due to stricter laws on data protection and a generally less intrusive approach to crime prevention. Regardless, the underlying theory of crime prediction and automated procedures remain the same.

The theories underlying predictive policing mirror those of seismology and epistemology, wherein analyzing the distribution of an event's attributes may make the occurrence of similar events more predictable. Numerous other criminological theories on the modes and drivers of criminal behavior also inform predictive policing and fall under an umbrella concept termed the 'environmental approach' in which environmental factors are analyzed for a correlation with crime. Often these theories are applied at the micro-level, identifying specific areas of a neighborhood that make a particular crime more likely to occur. Previous, heuristic approaches included the analysis of a map for factors considered obviously conducive to crime, such as main thoroughfares or twenty-four hour establishments. These characteristics may be logically connected to crimes of opportunity, allowing police to increase patrols with the aim of thwarting crime. As this approach is well established, this article argues that it is instead the addition of AI to predictive policing that has made its use much more efficient and arguably less compatible with existing legal procedures.⁹ With AI it is possible to correlate a multitude of otherwise unrelated factors that are not easily comparable or reconcilable. Such an algorithm is notable in its ability to perform quick calculations in real-time, but also to quantify and compare seemingly unrelated data points.¹⁰ Therefore, the more data used, the more accurate predictions of crime may be.

If this seems like a straightforward and objective method for preventing crime, in theory it is. However there are two caveats, among many, which must herein be acknowledged.¹¹ One being that the relationship between each of the analyzed factors, or data points, is completely correlative. Therefore there is no way to attribute causation between any one factor and the occurrence of crime. For example, by noting that the presence

⁹ See Park, R. et al. (1925) *The City*. University of Chicago Press.

¹⁰ For an explanation of algorithmic processing, see Lehr, D. and Ohm, P. (2017) Playing with the Data: What Legal Scholars Should Learn About Machine Learning. *U.C. Davis Law Review* 51 (2), pp. 653–718, p. 669; also Witten, I. and Frank, E. (2005) *Data Mining, Practical Machine Learning Tools and Techniques*, 2nd Ed. Elsevier, p. 83.

¹¹ See Aleš Završnik (2019) Algorithmic Justice: Algorithms and Big Data in Criminal Justice Settings. *European Journal of Criminology*.

of a streetlight is relevant to individual instances of vandalism, it cannot be inferred with any certainty the effect that the light alone has on crime. Instead, the factors are all correlated in some way that together make a particular outcome more likely.¹² As a result, even if it was possible to determine causation, it would be impossible to pinpoint what role exactly each factor plays relative to the others in making crime more likely.

A second caveat to predictive policing regards the actual predictive output of these programs. Predictive software function via algorithms trained to produce a numeric value that represents the probability a particular crime will occur in a particular time and place, based on known information. the term 'prediction' should not be mistaken for a definitive or near-definitive forecast of a crime's occurrence, but rather a probability.¹³ As the software is continually processing a never-ending feed of real-time data, only the outputs which indicate the most probable instances of crime are notable or actionable. Predictive policing therefore operates according to relative probabilities. The reasons for one area being designated at a higher risk of crime are not known to the officer, only the probability of crime occurring relative to elsewhere. This lack of context or explainability may cause a prediction to appear arbitrary and can require the blind trust of a patrolling officer. Regardless, police may use the tool to sort for the areas which they rank most at risk for crime and allocate resources accordingly.¹⁴

2.1 REGULATION AND ARTIFICIAL INTELLIGENCE

Currently there are not comprehensive bodies of regulation applicable to the varying uses of AI and certain sectors dominate the move toward regulation. Increasingly, recommendations are established to provide the best strategy for developing a certification process for the use of AI. Of these, a number of specific recommendations are ubiquitous, such as transparency and explainability, however the path to enforcement is unclear. The EU High Level Expert Group on Artificial Intelligence has also drafted guidelines for trustworthy AI, which include beneficence, non-

¹² Pasquinelli, M. (2019) How a Machine Learns and Fails - a Grammar of Error for Artificial Intelligence. *Journal for Digital Cultures*, Spectres of AI (5), pp. 8-9.

¹³ For an explanation of how AI functions, see Osoba, O. and Welser, W. (2017) *An Intelligence in Our Image: the Risks of Bias and Errors in Artificial Intelligence*. Santa Monica: RAND Corporation, pp. 4-7.

¹⁴ Lau, T. (2020) *Predictive Policing Explained*. New York: Brennan Center for Justice, 1 April.

-maleficence, autonomy, justice, and explicability.¹⁵ Such recommendations, though important for policymaking, are often crafted in the context of private or commercial industry which prioritize AI's effectiveness in producing a statistically accurate outcome. Though such guidelines also theoretically apply to criminal law, they are not devised to meet the particular demands of servicing justice. In the case of criminal law it is not only the technical accuracy of the technology which must be assessed, but also the appropriateness of its use in the criminal justice process.

Predictive policing is a statistical methodology, calculated through the advanced scientific discipline of AI. However despite the objective nature of these calculations, there are numerous ways in which the actual outcomes used for policing are both subjective and scientifically incomplete.¹⁶ The following sub-sections will illustrate two ways in which a reliance on AI may negatively impact the results of predictive policing; entrenching bias and the weakening of the reasonable suspicion standard.

2.2 ENTRENCHING BIAS

One of the most cited reasons for adopting predictive policing software is the perceived objectivity of using statistical analysis to guide police patrols.¹⁷ Jurisdictions subject to accusations of biased and discriminatory policing have claimed that the use of analytical tools allow unbiased policing practices to overcome traditional weaknesses.¹⁸ This logic, though appealing and maybe possible in a world of perfect information, has been largely discounted on account of the inherent human role in policing and the reliance of predictive policing on crime data. This sub-section will discuss the importance of data to predictive policing before explaining how its role in preventing crime entrenches bias.

For predictive policing to be comprehensive and accurate, large up to date datasets are required. Data on such a scale are subject to numerous collection methods, value judgments, and vulnerabilities to error, such as duplicity and lack of currency.¹⁹ As the tool that extracts predictions from

¹⁵ European Commission High Level Expert Group on Artificial Intelligence (2019) *Draft Ethics Guidelines for Trustworthy AI*, p. 5.

¹⁶ Haggerty, K. and Ericson, R. (1997) *Policing the Risk Society*. University of Toronto Press.

¹⁷ Perry W. et al. *Predictive Policing: the Role of Crime Forecasting in Law Enforcement Operations*, pp. 57-80.

¹⁸ Osoba and Welser, *An Intelligence in Our Image*, p. 17.

¹⁹ Meijer, A. and Wessels, M. (2019) Predictive Policing: Review of Benefits and Drawbacks. *International Journal of Public Administration*, 42 (12), pp. 1031-39, pp. 1035-1037.

various data, the quality of an algorithmic assessment may only be as accurate as the quality of the data. In using huge amounts of data from myriad sources, it is easy to imagine how a single error may cause incorrect correlations that are then replicated, shared, and again manipulated, treating the initial error as genuine data. Because the nature of an algorithm is self-sufficiency, even a small error has the potential to affect all future predictive outputs.²⁰ These processes bury errors deep within a dataset, making them extremely difficult to trace and correct. In addition, because most algorithmic processing constantly adapts via machine learning, the route by which input data become output data is nearly impossible to clearly trace.²¹ Therefore even if the error is identified it may be impossible to dissect it from the calculation. The resulting algorithmic processes are no longer transparent to human users, forming what is known as the “*black box of AI*.” This opaque format of calculations easily exacerbates, and is exacerbated by, any potential data errors.²² An error as seemingly innocuous as inverting a house number could cause ripple effects for predictive policing.²³

Of the numerous types of data used for predictive policing, historic crime data are without a doubt the most important. Crime data are not only subject to collection error, but their content may also be inherently flawed. Within crime statistics, a crime’s location and time are intrinsic to determining the factors relevant to future crime. This is problematic for two reasons. The first reason is the general lack of accuracy in historic crime data, due to human error, inconsistency, and incomplete information.²⁴ These shortcomings may be grouped as selection bias. Even were we able to assume that crime statistics are compiled without error, it still remains the case that crime is recorded as interpreted by individual police officers in different jurisdictions. This means that discretion over what constitutes a crime, how it may be acted upon or pursued, or even categorized, are

²⁰ Gstrein, O.J. et al. (2019) Ethical, Legal and Social Challenges of Predictive Policing. *Catolica Law Review*, 3 (3), pp. 77–98.

²¹ See Witten and Frank, *Data Mining, Practical Machine Learning Tools and Techniques*.

²² Perry W. et al. *Predictive Policing: the Role of Crime Forecasting in Law Enforcement Operations*, p. 36.

²³ Richardson, R. et al. (2019) Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice. *New York University Law Review*, 94, pp. 192–233, pp. 40–43.

²⁴ *Ibid.*; see also Lum, C. and Koper, C. (2017) *Evidence-Based Policing: Translating Research into Practice*. Oxford University Press.

recorded with variation.²⁵ Studies of policing consistently show that individual police biases are overwhelmingly present in policing data as a result of professional discretion.²⁶ This emphasizes the point that crime data reflect individual policing decisions on how and where to pursue crime, rather than actual criminal acts.²⁷ Data are further selective in that not all crimes are reported to police, further limiting the accuracy of such statistics.

The second problematic aspect of using historic crime data is bias as relates to discrimination. Even if an algorithm functions perfectly and the collection process is flawless, data reflecting consciously or unconsciously biased police practices will cause a biased prediction.²⁸ Data similarly reflect racially motivated arrests or ethnic profiling. In addition, even where data may be accurate, the types of correlations which may be applicable in one location or circumstance will not apply equally in others nor will these relationships remain steady over time. Similarly, because the future likelihood of a crime is regarded as reflective of past crime, the behaviors and traits of former arrestees will be reflected in the data as a group. As an algorithm infers correlations between data, the use of biased arrests as genuine indicators of crime will cause the production of biased inferences even in the absence of overtly biased data. This type of bad data is immune to corrective measures such as anonymization and minimization, due to the sophistication of AI.²⁹

For these two reasons, it is nearly impossible that a statistical calculation can be fully objective, despite the empirical accuracy of the software and the due care of its developers. It is clear that the algorithmic necessity of comprehensive data may conversely also act to lessen accuracy and even cause overtly discriminatory policing. Though the theories which underlie predictive policing may hold valuable insights into preventing crime and provide a great practical benefit to policing agencies, algorithmic processing does not escape the human error its use is intended to circumvent.

²⁵ Brantingham, J. et al. (2018) Does Predictive Policing Lead to Biased Arrests? Results From a Randomized Controlled Trial. *Statistics and Public Policy*, 5 (1), pp. 1–6.

²⁶ Law Society Commission on the Use of Algorithms in the Justice System and the Law Society of England and Wales (2019) *Algorithms in the Criminal Justice System*. United Kingdom: the Law Society, pp. 17–21.

²⁷ Lum, K. and Isaac, W. (2016) to Predict and Serve? *Significance*, 7 October, p. 3.

²⁸ Richardson, R. et al. Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice.

²⁹ Barocas, S. and Selbst, A. (2016) Big Data's Disparate Impact. *California Law Review*, 104 (3), pp. 671–732, pp. 714–723.

the inverse process will be discussed below; the use of predictive outputs by police when applying the reasonable suspicion standard.

2.3. WEAKENING THE REASONABLE SUSPICION STANDARD

The standard of reasonable suspicion requires police officers who are engaged in the stop of an individual to rely on the existence of “*facts or information which would satisfy an objective observer that the person concerned may have committed [the] offence,*” based on the known facts of a given situation.³⁰ Through this standard individuals should theoretically be able to interact with police on equal footing with others similarly situated. For example, in the course of a traditional patrol an officer may observe irregular behavior which due to context may lead most objective individuals to believe a stop is warranted. In applying the reasonable suspicion standard to a policing action that utilizes predictive analysis, there are several points at which the interaction is altered from the traditional application of the standard. Most notably, the integration of AI alters the circumstances such that the officer is no longer merely an objective observer.³¹ Several of the most impactful aspects of AI on the standard are discussed herein, such as the use of advanced information, the determination of high crime areas, and forming individualized suspicion.

At its core, the reasonable suspicion standard relates back to the individual discretion of an officer, based on his/her professional evaluation of a situation. The intended equity afforded by this formulation should in theory dictate that any two individuals behaving in a similar manner in the same area, at the same time of day, should be viewed in a similar light by an observing officer. Therefore, it may be expected that in a general sense there is a parity of information between the observer and observed.³² However it is with the inclusion of advanced information that the context changes for the officer and he/she may come to treat individuals differently.³³ With the infusion of large data sets into policing and the enhanced sorting capabilities of AI, reasonable suspicion technically

³⁰ *Ilgar Mammadov v. Azerbaijan* (2014) No. 15172/13, ECHR, pp. 21 at ¶188; See also Barrett, L. (2017) Reasonably Suspicious Algorithms: Predictive Policing at the United States Border. *N.Y.U. Review of Law & Social Change*, 41 (3), p. 331.

³¹ Ferguson, A.G. (2012) Predictive Policing and Reasonable Suspicion. *Emory Law Journal*, 62 (259), pp. 261–325, pp. 303–305.

³² Brennan-Marquez, K. (2017) ‘Plausible Cause’: Explanatory Standards in the Age of Powerful Machines. *Vanderbilt Law Review*, 70 (4), pp. 1249–1301, pp. 1258–1265.

³³ Ferguson, A.G. (2015) Big Data and Predictive Reasonable Suspicion. *University of Pennsylvania Law Review*, 163 (2), pp. 327–410, p. 326.

may be generated based on unobservable characteristics of an individual or location. In other words, the circumstances of an observation are no longer an equal exchange between the officer and the observed individual, but rather the officer may base his observation of the situation in the context of privileged information obtained by advanced technological methods.³⁴ As a result, the officer may have information that allows him to infer that noncriminal behavior of a particular individual has suspicious motive, based on supra-contextual data.³⁵

Another way in which the reasonable suspicion standard is altered by predictive policing is the designation of 'high crime' areas. As predictive policing is based on a sorting of relative risks, applying analyses to patrols may result in a "*denominator problem*".³⁶ That is, though a particular neighborhood may have an elevated probability of crime, it is only prioritized for patrol according to its risk relative to other areas. The identification of such areas on a chronic, ongoing basis may cause a conferring of the label of 'high crime.' These designated locations are considered to be at a consistently elevated risk for crime in general, but often also particular types of crime.³⁷ Though it has been considered academically, the weight of a high crime designation has not been legally determined for the purposes of forming reasonable suspicion. In addition to the fact that police may infer innocent behavior to be suspicious as a result of location, they are subsequently more likely to spend extra time in these areas and statistically more likely to issue arrests. This is referred to as a feedback loop, in which increased policing of an area increases arrests, in turn fueling the future algorithmic assessment of a high crime area.³⁸ This has the effect of not only causing a mis-application of the reasonable suspicion standard, but also the targeting of individuals fitting a particular profile, affecting both individual and group rights.

³⁴ Joh, E. (2014) Policing by Numbers: Big Data and the Fourth Amendment. *Washington Law Review*, 89, pp. 35–68, p. 55.

³⁵ Ferguson, A.G. (2015) Big Data and Predictive Reasonable Suspicion. *University of Pennsylvania Law Review*, 163 (2), pp. 327–410, pp. 398–404.

³⁶ Ferguson, A.G. (2012) Predictive Policing and Reasonable Suspicion. *Emory Law Journal*, 62 (259), pp. 261–325, p. 300.

³⁷ Ferguson, A.G. (2011) Crime Mapping and the Fourth Amendment: Redrawing 'High-Crime Areas.' *Hastings Law Journal*, 63 (1), pp. 179–232, p. 203.

³⁸ Barrett, L. (2017) Reasonably Suspicious Algorithms: Predictive Policing at the United States Border, p. 337.

Dependence on predictive outputs can be misleading and cause over-policing in one place while allowing only a dearth of resources for others.³⁹

Finally, forming individualized suspicion is the very essence of the reasonable suspicion standard. However it is easy to see how an officer may infer additional information from a predictive analysis. Though a geographic profile or high crime determination is insufficient basis for a police stop, it may inform the officer's perception of the context.⁴⁰ As predictive analyses are based on the comparative correlations between representative or proxy data,⁴¹ an overreliance on predictive analyses overemphasizes the importance of a general profile according to the relationship represented by data, rather than actual information itself.⁴² The composition of a risk profile is therefore not predicated on the individual and his/her actions, but rather attributes undue weight to an algorithmic assessment of the context. This not only excludes an individual assessment, but may even lessen an officer's ability to view an individual objectively.

The application of predictive analyses to police patrols reveals an overestimation of the ability of AI to align with existing standards of criminal justice. Though forming reasonable suspicion still requires an officer to act as an objective observer, it is nearly impossible for him to also separate outside knowledge of a situation in such a way that does not risk projecting a general profile onto individuals. As predictive analyses center on general profiles, this indicates little of an individual. Like all other policing actions, those taken in reliance on AI will be subject to scrutiny in later trial processes, the topic of the second section of this paper.

3. FAIR TRIAL PROCEDURES

This article argues that using AI to prevent crime has the potential to drastically decrease the likelihood that a criminal defendant will receive a fair trial. Specifically, because the ability of an individual to present a successful defense in many aspects relates directly back to the origins

³⁹ Završnik, A. (2020) Criminal Justice, Artificial Intelligence Systems, and Human Rights. *ERA Forum*, 20, pp. 567–83, p. 575.

⁴⁰ Ferguson, A.G. (2012) Predictive Policing and Reasonable Suspicion, p. 306.

⁴¹ Harcourt, B. (2015) Risk as a Proxy for Race: the Dangers of Risk Assessment. *Federal Sentencing Reporter*, 27 (4), pp. 237–43, pp. 237–239. See also, Gless, S. (2018) Predictive Policing - in Defense of 'True Positives'. In Bayamlioglu, E., et al. (eds.) *Being Profiled: Cogitas Ergo Sum; 10 Years of Profiling the European Citizen*. pp. 76–83, p. 80.

⁴² Joh, E. Policing by Numbers: Big Data and the Fourth Amendment, pp. 40–42.

of an arrest or charge, policing decisions must also comply with standards of fairness. As the preceding section illustrates, the means of forming predictive policing analyses, as well as the subsequent use of that information, alter the balance of power between the individual and police. This imbalance is carried through to the trial stage and may manifest as advantageous to the prosecution.

The principle of a fair trial is formally articulated in Article 6 of the European Convention on Human Rights (ECHR).⁴³ Though the fair trial components as codified in Article 6 generally apply to processes subsequent to a charge, their application is clearly affected much earlier. Because the consequences of predictive policing arguably hold equivalent practical value to the fairness and outcome of trial procedures, it should be required to meet the standards of formalized pre-trial processes, namely criminal investigation.⁴⁴ By way of example, if a search and seizure subsequent to arrest was challenged for legitimate grounds, an officer will be required to account for his actions and the decisions made leading up to the arrest. In the same scenario, if the results of a predictive analysis were produced as supporting evidence for the arrest, it would be necessary to make accessible the predictive analysis' composition, input, output, and the grounds for its subsequent use as a source of intelligence in order to satisfy a comparable level of accountability. For reasons already discussed, this level of information may not be available in the case of a predictive analysis. This section will therefore analyze several components of a fair trial to determine whether altered predictive policing methods as described above are compatible with Article 6 requisites.

The following sub-section will begin by discussing the concept of the equality of arms, which provides the standards for ensuring a procedural balance between the parties to a trial. It will then analyze the effects of predictive policing on applying the equality of arms, specifically as regards maintaining the presumption of innocence and the ability to confront contradictory evidence. Ultimately, the section will conclude that the proper implementation of these fair trial processes is hindered by the inherent complexity of AI and its effect on policing.

⁴³ *The European Convention on Human Rights*, 1952.

⁴⁴ See Wasek-Wiaderek, M. (2000) *the Principle of "Equality of Arms" in Criminal Procedure under Article 6 of the European Convention on Human Rights and Its Functions in Criminal Justice of Selected European Countries*. Leuven University Press, pp. 19-22.

3.1 EQUALITY OF ARMS

The principle of the equality of arms refers to upholding various aspects of procedural fairness between parties in judicial processes.⁴⁵ Though a criminal charge *prima facie* implies that the charging authority has reason to suspect an individual is guilty, trial procedures must apply to parties equally and impartially.⁴⁶ Criminal trials are conducted according to the adversarial, or contradictory principle, which allows each party a reasonable opportunity to make its case, through the presentation of supportive evidence and witnesses, as well as the ability to challenge opposing evidence and witnesses.⁴⁷

The notion of equality is not absolute, but rather refers to a legal fiction establishing the relative placement of the parties before the court to ensure certain procedures are guaranteed and that there is no substantial, procedural disadvantage to either party.⁴⁸ Though these protections are explicitly applied to trial processes, the ECtHR has also extended these rights to pre-trial procedures.⁴⁹ This paper argues that because a lack of transparency in police practices subsequent to criminal proceedings make it virtually impossible to ensure that the fair trial tenets can be fairly respected, police practices may be incongruous with the equality of arms and therefore should be considered to fall within the scope of Article 6 pre-trial procedures. The following sub-sections will address two precepts of the equality of arms: the presumption of innocence and the right to confront evidence. as will be established, these too are affected by the use of AI in predictive policing and greatly alter the balance of a fair trial.

3.2. PRESUMPTION OF INNOCENCE

Enshrined in Article 6.2 ECHR, the presumption of innocence dictates that *“everyone is entitled to a fair and public hearing within a reasonable time*

⁴⁵ Vitkauskas, D. and Dikov, G. (2017) *Protecting the Right to a Fair Trial Under the European Convention on Human Rights; A Handbook for Legal Practitioners*. 2nd ed. Council of Europe, pp. 60-65 citing, *Ruiz-Mateos v. Spain*. See also, Silveira, J.T. (2015) Equality of Arms as a Standard of Fair Trials. Vilnius, 15 May.

⁴⁶ Campbell, L. (2013) Criminal Labels, the European Convention on Human Rights And the Presumption of Innocence. *The Modern Law Review*, 76 (4), pp. 681-707, p. 16. See also de Jong, F. and van Lent, L. (2016) the Presumption of Innocence as a Counterfactual Principle. *Utrecht Law Review*, 12 (1), pp. 32-49, p. 34.

⁴⁷ Silveira, “Equality of Arms as a Standard of Fair Trials.”

⁴⁸ *Regner v. the Czech Republic* (2017) No. 35289/11, ECHR.

⁴⁹ Campbell, “Criminal Labels, the European Convention on Human Rights And the Presumption of Innocence.”

by an independent and impartial tribunal established by law".⁵⁰ The presumption is initiated following the issuance of a criminal charge and applies until such time a guilty verdict is rendered.⁵¹ It further attaches the burden of proof to the prosecution and generally requires that no state official or authority may publicly imply the guilt of the accused while the investigation or trial pends.⁵² An important component of the equality of arms principle, the presumption further ensures fairness⁵³ between parties by recognizing that the ability of the state as moving party is often stronger than that of an individual.⁵⁴ The presumption therefore acts as a very important counter-weight to the dominant powers of the state in building a criminal case and aims to foster impartial processes.⁵⁵ When the presumption is weakened, the balance of power may shift toward the state at the expense of individual autonomy. Though the Convention explicitly ties the presumption's application to trial processes, legal scholars as well as the ECtHR have also approached it with an expanded view. As a result, this section discusses the two main interpretations of the presumption; the subjective, or normative approach, and the stricter doctrinal approach.⁵⁶

According to the subjective approach, the presumption is based around a moral core intended to protect the integrity of the trial process.⁵⁷ This notion holds that any deprivation of liberty to the innocent is a miscarriage of justice and should be as limited as possible.⁵⁸ The limitation though not absolute, applies to pre-trial procedures such as pre-trial detention and

⁵⁰ *The European Convention on Human Rights*. (1952) Article 6.2.

⁵¹ Vitkauskas and Dikov, *Protecting the Right to a Fair Trial Under the European Convention on Human Rights; A Handbook for Legal Practitioners*, pp. 113-116.

⁵² "The presumption of innocence does not have any cognitive pretensions but prescribes the hypothetical starting point of due process." See Van Sliedregt, E. (2009) A Contemporary Reflection on the Presumption of Innocence. *Revue internationale de droit penal*, 80 (1), pp. 247-267, p. 264; See also, Galetta, A. (2013) the Changing Nature of the Presumption of Innocence in Today's Surveillance Societies: Rewrite Human Rights or Regulate the Use of Surveillance Technologies? *European Journal of Law and Technology*, 4 (2).

⁵³ See *Pataki & Dunshirn v. Austria* (1963) No. 596/59 and 789/60, ECHR.

⁵⁴ Ashworth, A. (2006) Four Threats to the Presumption of Innocence. *the International Journal of Evidence & Proof*, 10, pp. 241-79, pp. 249-250.

⁵⁵ de Jong, F. and van Lent, L. the Presumption of Innocence as a Counterfactual Principle, p. 35.

⁵⁶ See Ellis, A. and Allenbaugh, M. (2020) INSIGHT: Does Presumption of Innocence Preclude Use of Acquitted Conduct at Sentencing? *Bloomberg Law*, 31 January.

⁵⁷ de Jong, F. and van Lent, L. the Presumption of Innocence as a Counterfactual Principle, p. 35.

⁵⁸ Mendola, M. (2016) One Step Further in the 'Surveillance Society': the Case of Predictive Policing. Adv. LL.M. *Leiden University Tech and Law Center*, pp. 11-12.

criminal investigations. Analogous to an investigation, an individual deemed by predictive analysis to be in a class of persons likely to commit a crime *de facto* becomes subject to investigative measures, even in the absence of a formal charge.⁵⁹ The use of pre-emptive crime control then expands the category of suspect, a label which like defendant, brings a degree of deprivation of liberty as well as other unavoidable forms of treatment to which an innocent person is not subjected. to apply the presumption to the suspect of a formal investigation but preclude an individual who may be similarly treated by police for a lesser cause is inconsistent in effect. Extending the protections conferred by Article 6.2 from formal investigations to predictive policing would thereby better fulfill the normative rationale of the presumption.

According to the doctrinal approach which ties the presumption to procedural specifications, the ECtHR has held that the presumption of innocence “does not only apply in the context of pending criminal proceedings. It also protects individuals who have been acquitted of a criminal charge, or in respect of whom criminal proceedings have been discontinued”⁶⁰. This formulation not only maintains the strength of the presumption as a functional protection beyond the trial, but also acts to guard an individual’s reputation.⁶¹ This has at times been achieved by invoking alternate legal frameworks such as the Article 8 right to private life, further demonstrating the Court’s inclination to maintain the presumption in these extended instances.⁶² As confirmed in *Cleve v. Germany*, the Court held that “the protection afforded by the presumption of innocence ceases only once an accused has properly been proved guilty of the offence charged with, which is never the case if he is acquitted”.⁶³

Following an acquittal, the Court identifies violations of the presumption by distinguishing between passive utterances of suspicion and formal acts which indicate a refusal to accept one’s

⁵⁹ Pamela Ferguson, P. (2016) the Presumption of Innocence and Its Role in the Criminal Process. *Criminal Law Forum*, 27, pp. 131–58, p. 141.

⁶⁰ *Cleve. v. Germany* (2015) No. 48144/09, ECHR.

⁶¹ Council of Europe (2020) Guide on Article 6 of the European Convention on Human Rights; Right to a Fair Trial (Criminal Limb), p. 62, citing *Allen v. the United Kingdom*, 94.

⁶² Galetta, A. (2013) the Changing Nature of the Presumption of Innocence in Today’s Surveillance Societies: Rewrite Human Rights or Regulate the Use of Surveillance Technologies? *European Journal of Law and Technology*, 4 (2) citing *Sekanina v. Austria* (1993) No. 13126/87, ECHR.

⁶³ *Cleve. v. Germany*, pp. 9, 41.

innocence.⁶⁴ In the case of *S. and Marper v. the United Kingdom*, in which the question regarded retaining biometric information of acquitted parties for future database queries, the Court held that allowing the inclusion of acquitted individuals in a (criminal) DNA database “enlarges the category of ‘suspect’,”⁶⁵ and that this could not be considered necessary in light of the undue consequences on individuals’ reputations.⁶⁶ The use of a static DNA sample for solving a crime requires proactively searching a database for a match in the aftermath of a crime. Applying the Court’s judgment to predictive policing, in which historic crime data are actively and autonomously assessed for suspicion of unknown, un-committed crimes, the category of suspect is even further widened. Were the Court to address such an expanded use of acquitted individuals’ data to form pre-emptive suspicion, it may reach an even more expanded reading of the presumption.⁶⁷

The Court’s strong approach to applying the presumption to post-acquittal treatment is notable for the case of predictive policing. Predictive analyses rely heavily on crime data that include and prioritize arrest records and non-custodial stops. Because crime data are static, an arrest once made will always be reflected as such in police records, regardless of the charge’s formal disposition. Therefore if an individual is arrested and charged for a crime but is later acquitted, for the purposes of a predictive software using historical arrest data, the acquittal is irrelevant. as a result, the predictive use of historic crime statistics allows the inference that an acquitted individual will be algorithmically equated with one found guilty, all other factors constant. Indeed, data on prior offenders inform both geographic and individual predictive profiles, based on a calculated “propensity to commit harmful behavior”.⁶⁸ It may be further inferred that previously acquitted individuals are more likely than the average person to be stopped

⁶⁴ See Campbell, L. (2012) A Rights-Based Analysis of DNA Retention. *Criminal Law Review*, 12, pp. 889-905, p. 7.

⁶⁵ The ECHR refers to this as the ‘pérennisation de la catégorie de “suspect”’, see Galetta, the Changing Nature of the Presumption of Innocence in Today’s Surveillance Societies: Rewrite Human Rights or Regulate the Use of Surveillance Technologies?

⁶⁶ *S. and Marper v. United Kingdom* (2008) No. 30562/04 and 30566/04, ECHR. See also Galetta, *ibid.*

⁶⁷ See Campbell, L. Criminal Labels, the European Convention on Human Rights And the Presumption of Innocence, pp. 5-6, 21-23.

⁶⁸ *Ibid.* p. 25. See also, Mendola, M. One Step Further in the ‘Surveillance Society’: the Case of Predictive Policing, p. 15.

in the course of a predictive patrol.⁶⁹ The *Marper* Court held that to be treated as guilty after having been cleared of an offence may risk stigmatization.⁷⁰ This type of “evidence-based” stigmatization⁷¹ further extends well beyond the criminal justice system into applications for jobs, housing, and credit.⁷²

3.3. NORMATIVE EFFECTS

Finally, in considering the presumption the methodology behind predictive policing raises deeper questions as to the value of punishment. Punishment of criminal offenses varies in rationale, among the most widely accepted justifications for its use are deterrence, retribution, and providing an offender the opportunity for rehabilitation.⁷³ Each of these sanctions operate to serve a purpose and close the matter on the commission of an offence. In the case of rehabilitation, good faith investment in reform by both the state and an offender may be futile if the individual cannot overcome the stigma of a criminal record and truly reenter society.⁷⁴ Similarly, the principle of legal certainty provides that laws are clearly and publicly available, so as to ensure that no individual may be held accountable for violating a regulation which was not reasonably known to him.⁷⁵ If criminal sanctions do little to rebuild the name of the offender and an acquittal cannot protect him/her against undue future, pre-emptive suspicion, the value of punishment and legal certainty are arguably diminished.

As demonstrated, the presumption of innocence acts as a necessary ‘shield’ against undue state inference during and beyond the trial process. According to both the subjective and doctrinal approaches, predictive policing may constitute a violation of Article 6.2 due its reliance on historic crime data. Therefore in order to ensure the fairness of individual criminal trials, as well as maintain the core components of fairness in criminal justice,

⁶⁹ Joh, E. Policing by Numbers: Big Data and the Fourth Amendment, p. 55.

⁷⁰ Mendola, M. One Step Further in the ‘Surveillance Society’: the Case of Predictive Policing, p. 15.

⁷¹ Gstrein et al. Ethical, Legal and Social Challenges of Predictive Policing, p. 10.

⁷² Amnesty International (2018) *Trapped in the Matrix: Secrecy, Stigma, and Bias in the Met’s Gangs Database*. United Kingdom: Amnesty International, p. 20.

⁷³ Kehl, D. et al. (2017) *Algorithms in the Criminal Justice System: Assessing the Use of Risk Assessments in Sentencing*, pp. 13-15.

⁷⁴ See Ross Coomber et al., *Key Concepts in Crime and Society*, Key Concepts (Sage, 2014) pp. 160-164.

⁷⁵ Brennan-Marquez, K. (2017) ‘Plausible Cause’: Explanatory Standards in the Age of Powerful Machines, pp. 1288-1294.

the efficiencies of AI must be weighed against its inconsistencies, as illustrated by applying the presumption of innocence.

3.4. CONFRONTING EVIDENCE

According to Article 6 ECHR, in order to maintain procedural fairness it is additionally necessary that parties may confront the evidence and claims against them, as well as present evidence and witnesses in their defense.⁷⁶ The ECtHR has held that a lack of opportunity “to have knowledge of and comment on the observations filed or evidence adduced by the other party” may wrongly influence the outcome of a hearing, in nonconformity of the notion of an adversarial trial.⁷⁷ This right includes documentary evidence, such as digital files or data.⁷⁸ The ECtHR has further addressed not just the availability of evidence, but its *accessibility*, for instance when one party relies on advanced technology to sort evidence. In *Sigurdur Einarsson a. o. v. Iceland*, the Court held that a party must have adequate access to evidence and should not be forced to rely on a selection of information as determined by the prosecution. In this case the defendant alleged that he did not have full access to a file in which the prosecution had gathered extensive data acquired in an investigation pursuant to a search warrant. The prosecution searched and tagged the data for potential evidence and the information deemed relevant was submitted to the Court. The defendant however, was not granted access to the full body of data but was bound to the prosecution’s determination of potentially exculpatory evidence. The Court held that the defense must have the opportunity to assess potential evidence in its entirety and that due to the complexity of the digital system utilized by the prosecution, the defense did not have adequate resources to prepare.⁷⁹ Therefore availability alone does not fulfill the Article 6 requirement to confrontation, but accessibility must also be ensured.

In the case of predictive policing, the very nature of AI obscures both the availability as well as the accessibility of evidence. Many of the algorithms used for predictive policing function via machine

⁷⁶ de Jong, F. and van Lent, L. the Presumption of Innocence as a Counterfactual Principle, pp. 34-35.

⁷⁷ *McMichael v. United Kingdom*, (1995) No. 16424/90, ECHR, 80.

⁷⁸ Završnik, A. Criminal Justice, Artificial Intelligence Systems, and Human Rights, p. 577 citing *Georgios Papageorgiou v. Greece* (2003) No. 59506/00, ECHR, 37.

⁷⁹ *Sigurdur Einarsson a. o. v. Iceland* (2019) No. 397517/15, ECHR.

learning, which acts autonomously of human decision making processes.⁸⁰ Though algorithmic code itself may initially be known to its programmers and theoretically interpretable by others, once in operation the continuous self-processing of machine learning permanently alters the original source code, resulting in the black box phenomenon.⁸¹ This may present procedural complications to availability for an individual who is challenging police action predicated on the use of a predictive analysis. Unbeknownst to him, the individual may meet a profile particular specific to an area designated as “high risk”, whereas the police may claim that their stop and arrest was predicated on an appropriately individualized reasonable suspicion. Should the individual wish to challenge the high risk designation forming the context in which his behavior appeared suspicious, as well as the details of a profile which he allegedly fit, it may be impossible for the police to satisfactorily provide the output and composition of the analysis.⁸² Further, even were it provable that a risk assessment is accurate beyond reproach, there is no way to prove that the input data were accurate and unbiased.⁸³ In addition, it is likely that neither the judge nor the prosecutor understands the utilized technology.⁸⁴ This not only presents an obstacle to the defendant challenging evidence, but also casts a veil of obscurity over the entire trial process. Therefore several layers of opacity stand in the way of a comprehensive criminal defense when evidence is produced or manipulated by AI.

Further contributing to the unavailability of predictive policing data, many software programs are held closely by proprietors as trade secrets.⁸⁵ In jurisdictions such as the United States where the issue has frequently arose in court, judges will honor and protect a company’s legal right to conceal critical elements of predictive policing software deemed as intellectual property. Therefore, original code and subsequent algorithmic processing are non-discoverable due to their legally protected

⁸⁰ Roth, A. (2017) Machine Testimony. *the Yale Law Journal*, 126, pp. 1972–2053, pp. 1978-1979.

⁸¹ See Pasquinelli, How a Machine Learns and Fails - a Grammar of Error for Artificial Intelligence.

⁸² Brennan-Marquez, K. ‘Plausible Cause’: Explanatory Standards in the Age of Powerful Machines, p. 1267; see also Ferguson, Crime Mapping and the Fourth Amendment: Redrawing ‘High-Crime Areas.’

⁸³ Kehl et al. Algorithms in the Criminal Justice System: Assessing the Use of Risk Assessments in Sentencing, pp. 28-32.

⁸⁴ Gstrein et al. Ethical, Legal and Social Challenges of Predictive Policing, p. 6.

⁸⁵ Re, R. and Solow-Niederman, A. (2019) Developing Artificially Intelligent Justice. *Stanford Technical Law Review* 22 (2), pp. 242–89, pp. 275-278.

secrecy. This may all but preclude a line of inquiry from the defendant's ability to present a case challenging the conclusions of a risk assessment.⁸⁶

As regards accessibility, even if a defendant successfully opens the black box or circumvents a trade secret, the prosecution still retains an advantage in both its access to advanced computing power and a monopoly on data. One reason for this is the extensive amount of information collected by policing agencies and the advanced resources they maintain to assess these data. This may be particularly true in jurisdictions where there is open sharing of data between police and government agencies. Even when the prosecution is willing to relinquish the information, the data are buried in a repository of massive quantity, often held by a third party and not easily dissected for relevance without the aid of sophisticated technology.⁸⁷ Therefore a defendant must rely on the prosecution for cooperation in identifying and sharing exculpatory information. Though a defendant may wish to hire an expert witness to unpack the data and testify as an expert, this is often practically prohibitive due to availability and expense, leaving evidence virtually inaccessible.

Finally, a point on the probative value assigned to scientific processes such as algorithmic profiling. In many systems where the issue has been addressed, the use of predictive policing outputs are currently ill-aligned with the rules in place for presenting evidence and expert testimony in criminal trials.⁸⁸ Many types of machine produced evidence have long been accepted by courts as true and admissible, such as DNA matching, photographic evidence, and breathalyzer results.⁸⁹ However whereas these more traditional forensic methods are designed to reflect the exact result intended, the adaptive nature of machine learning algorithms makes it near impossible to explain and verify the end results.⁹⁰ Due to a lack of transparency, predictive policing software are very difficult to substantiate as scientifically valid. Further, should appropriate rules be

⁸⁶ Wasek-Wiaderek, the Principle of "Equality of Arms" in Criminal Procedure under Article 6 of the European Convention on Human Rights and Its Functions in Criminal Justice of Selected European Countries, pp. 17-32.

⁸⁷ Zavrsnik, A. Criminal Justice, Artificial Intelligence Systems, and Human Rights, pp. 576-578.

⁸⁸ Roth, A. Machine Testimony, p. 2022.

⁸⁹ Henley, J. (2019) Denmark Frees 32 Inmates over Flaws in Phone Geolocation Evidence. *The Guardian*, 12 September.

⁹⁰ Nutter, P. (2019) Machine Learning Evidence: Admissibility and Weight. *Journal of Constitutional Law*, 21 (3), pp. 919-58, pp. 925-928.

established as to the standards of admissibility for this type of evidence, it is not clear what probative weight the results should be given.⁹¹

As this section has demonstrated, fair trial processes are severely affected by influences from outside the courtroom. In the case of using AI for predictive policing, numerous points of incompatibility exist with the components of a fair trial. Regarding the presumption of innocence, the process of predictive policing is itself at odds with upholding the presumption, due to the use of static, historic crime data. In addition, the nature of predictive policing software renders evidence virtually unavailable and inaccessible for the average defendant to utilize in a criminal defense. Though these issues may be resolved through adaptations at both the technological as well as procedural levels, as they currently exist, preventing crime with AI may severely limit the implementation of a fair trial.

4. CONCLUSION

As demonstrated, the effects of AI's use are not strictly limited to its immediate application. This is particularly true in the case of predictive policing, in which the large scale of data collection and inner complexities of machine learning algorithms make it near impossible to explain the manner in which decisions are reached. In this regard, the predictive technology used by police cannot adequately meet the ECHR standards of a fair trial. In reaching this determination the paper assessed several Article 6 components. As regards the presumption of innocence, it is clear that predictive policing may skirt the core notions of the presumption as well as the procedural protection it affords. Similarly in weighing the ability of a defendant to assess and confront evidence presented against him, it was demonstrated that the relative unavailability and complexity of risk assessments preclude the full exercise of the right as afforded in the adversarial trial. Together, it is clear that the current use of AI for predictive policing is not compatible with ECHR Article 6.

The ongoing evolution of criminal law practices not only affects individual trial outcomes but also contributes to the transformation of legal values and processes. Many scholars cite this "*production of technical knowledge*" as causing a shift in judicial functions by moving the emphasis

⁹¹ Završnik, "Algorithmic Justice: Algorithms and Big Data in Criminal Justice Settings" p. 10.

from the human to the machine.⁹² In justifying the use of machine generated content to inform legal outcomes, we must remember predictive analyses are not calibrated to consider the human aspects of criminal justice.⁹³ The role of a judge requires human insight as well as knowledge of the law, which is then translated into language that aligns to societal custom. the chasm between the reality of a situation and the state of the law may not be easily recognizable to a machine, or in other words, justice may not be reducible to an algorithm.⁹⁴ This article concludes that there is not only a mismatch between legal applications and predictive software, but also in expectations for applying machine learning to social processes. It should not be assumed that the use of algorithmic decision making, which is evaluated for its efficiency and computational accuracy, is the appropriate measure by which judicial processes should largely function.⁹⁵

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⁹² Re, R. and Solow-Niederman, A. (2019) Developing Artificially Intelligent Justice. *Stanford Technical Law Review* 22 (2), pp. 242-89, p. 251; citing Harcourt (2007) *Against Prediction: Profiling, Policing, and Punishing in an Actuarial Age*, 32.

⁹³ Bayamlioğlu, E. and Leenes, R. (2018) the 'Rule of Law' Implications of Data-Driven Decision-Making: A Techno-Regulatory Perspective. *Law, Innovation and Technology*, 10 (2), pp. 295-313.

⁹⁴ Nutter, Machine Learning Evidence: Admissibility and Weight, pp. 951-952.

⁹⁵ Quattrocchi, An Introduction to AI and Criminal Justice in Europe, pp. 1530-1531.

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