


An introduction to AI and criminal justice in Europe

Introdução à inteligência artificial e à justiça criminal na Europa

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ABSTRACT: The article focuses on the need to start a comprehensive and multidisciplinary discussion about the specific interaction between AI and criminal justice, especially within the European context. Indeed, criminal law is considered, for several reasons, a realm in which computational modelling and AI cannot have a direct and relevant application. On the contrary, there is an urgent need to start a legal reflection about both the short- and long-term effects of such technology, that is reshaping all aspects of our social existence, justice included. The purpose of this article is to point out the most relevant risks in this scenario. There is no ambition to deliver answers but, rather, the need to set specific questions about if and how AI can be integrated into the criminal justice European systems. The author delays to a more comprehensive study any attempt of answering such questions.

KEYWORDS: computational models; algorithms; decision-making process; *stare decisis*; judicial independence.

RESUMO: O presente artigo analisa a necessidade de iniciar uma discussão global e multidisciplinar em relação à interseção existente entre a inteligência artificial e a justiça penal, especialmente no contexto europeu. De fato, por diferentes razões, o direito penal é considerado o campo no qual a estrutura computacional e a inteligência artificial não podem obter uma aplicação direta e relevante. Ao contrário, constata-se uma urgente necessidade de iniciar uma reflexão global sobre os efeitos em curto e longo prazo de tal tecnologia, que está remodelando todos os aspectos de nossa existência social, a começar pela justiça. Nesse

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cenário delineado, o objetivo deste trabalho é evidenciar os riscos mais relevantes atualmente existentes. Contudo, não há a ambição de fornecer respostas, mas, ao contrário, expor perguntas específicas sobre se e como a inteligência artificial possa ser integrada nos sistemas europeus de justiça penal. Remete-se a um estudo mais completo para qualquer tentativa de responder a tais questionamentos.

PALAVRAS-CHAVE: *modelos computacionais; algoritmos; processo decisório; stare decisis; independência judiciária.*

SUMMARY: 1. Criminal law and the digital revolution. 2. Realism v. dystopianism. 2.1. The complexity of algorithmic decisions. 2.2. The protection of fundamental rights. 3. Criminal law v. prevention of crime. 3.1. The specificity of criminal law. 3.2. The specificity of Europe. 3.3. Specific implications of stare decisis. 4. Conclusions. Bibliography.

1. CRIMINAL LAW AND THE DIGITAL REVOLUTION

In the common sense, ‘criminal law’ and ‘technology’ are considered, traditionally, non-reconcilable terms. Being the ultimate reaction of a jurisdiction to the aggression upon the core values of the society, criminal law is strictly embedded in the social culture. The topic has been dwelled abundantly in the European continental literature, from which we derive the idea that criminal law grasps national *Kulturformen*, reproducing the general – or, at least, the most common – values of a population.² In so far, Criminal Law tends to be, all over the world, a slow-changing factor, clearly because cultural shifts are slow-evolving phenomena: only settled down transformations can be ratified by the law, not only in the statutory-law legal systems.

Although law is one of the means to influence people’s behaviour,³ in democratic societies Criminal Law seems to be unfitted to drive

² Cadoppi Alberto, *Il valore del precedente nel diritto penale*. 2nd ed., Giappichelli, Torino, 2014, p. 22.

³ See Julia Black’s perspective on decentred regulation, in which law is one out of many different systems to influence social behaviour: Black Julia, *Critical*

normative changes in social behaviour, rather to crystallise accomplished processes into sets of commands, reflecting an accepted framework of social values. Indeed, this is perfectly understandable: the harshness of penalties implies that the reject of a specific conduct is shared by a vast majority of the community, as much as the abolition of an offence (either statutory or judge-made) implies a general recognition of legitimacy in such conduct. If not, the legislator is imposing, non-democratically, values and rules that do not reflect common opinions and feelings. In continental criminal law this may indirectly impinge on one of the modern understandings of the rule of law, it is to say 'requirability' (esigibilità), that implies full understanding of the criminal behaviour and command by individuals: the latter could not be expected to avoid criminal behaviours if it is not possible for them to fully and properly grasp what the law considers to be criminal.

However, it is undisputed that, in the last decades, the contemporary society witnessed a computational turn, that, now we all understand,⁴ is not only a breath-taking scientific advancement, a radical change in every professional realm, but, overall, is one of the most rapid, astonishing and wide-spread cultural changes ever occurred.⁵ This has been touching the foundations of our society⁶ in such a way to permeate even the steady core of criminal law.

These preliminary remarks suggest two very general observations. Firstly, if criminal law is a sort of picture of the existing cultural context in a jurisdiction, there is no possibility for it to move ahead, or keep in track with, scientific progress, that is reshaping social habits. Scientific progress will always precede changes and amendments in criminal law.

Reflections on Regulation, in *Australian journal of legal Philosophy*, 2002, vol. 27, 1-36, p. 4

⁴ Even though some had clearly foreseen it, decades ago: Negroponte Nicholas, *Being Digital*, Hodder&Stoughton, London 1995; Kurzweil Ray, *The Singularity is Near*, Viking, New York, 2005, p. 7, 8.

⁵ Floridi Luciano, *The Fourth Revolution*, OUP, Oxford 2017, *passim*.

⁶ See Garapon Antoine, Lassègue Jean, *Justice digitale*, PUF, Paris, 2018, especially 83 ff.: «la révolution numérique bouleverse tous les compartiments de l'existence collective».

Secondly, the impact of the computational turn upon the realm of criminal justice turned out to be much wider than the area of ‘traditional’ cybercrime. Although the concept of cybercrime acknowledged at the beginning of this Century, as “computer-mediated activities which are either illegal or considered illicit by certain parties and which can be conducted through global electronic networks”⁷, may not be considered wrong in itself, the phenomenon proved much more articulated and sophisticated over the decades. Today, the legal research in that branch of criminal law evolved into an attempt to theorise the application of the classic legal categories to artificial intelligence entities.⁸

Moreover, the digital revolution that globally occurred especially over the last decade is having repercussions upon every aspect of the administration of criminal justice, far behind the aspects that have been addressed by the Budapest Convention on Cybercrime. The turn into a digital society is determining substantial changes not only in the context in which crime may occur, or in the way investigations can be carried on. Delivering justice is a human task and the sudden digital change into individuals’ life-style is affecting the way in which such task is performed,⁹

⁷ See, among the first attempts to define the concept, Sieber Ulrich, *Computerkriminalitaet und Strafrecht*, Carl Haymanns Verlag, Koeln, 1977, passim. Thomas, Loader, p. 3. Although both research and legislation evolved significantly, it is still impossible to give one, unique and undisputed definition of cybercrime. “Cybercrime is a container term of convenience, describing a collection of acts or a field of criminal activity, rather than a single concept”: Boister Nicholas, *An introduction to Transnational Criminal Law*, 2nd ed., OUP 2018, 188. Moreover, many other similar terms are often used, such as ‘computer crime’, ‘IT crime’... It has been said that the concept encompasses a whole range of terms which imply that the digital technology (not only computers) is an element of the offence. In this sense, internet connections are necessary elements, either for crimes against digital technologies and crime committed by means of digital technologies: Sieber Ulrich, *Mastering Complexity in the Global Cyberspace: the Harmonisation of Computer-Related Criminal Law*, in M. Delmas Marty, M. Pieth, U. Sieber (eds), *Les Chemins de l’harmonisation pénale*, 2008, 127

⁸ Pagallo Ugo, Quattrococo Serena, *The Impact of AI on Criminal Law and its twofold procedures*, in W. Barfield, U. Pagallo, *Research Handbook on the Law of Artificial Intelligence*, 2018, Edgar Elgar, p. 400

⁹ See the seminal work of Susskind Richard, *The End of Lawyers?*, OUP, 2008.

impinging on the inner aspects of it, such as the decision-making process. These aspects will be analysed in the following paragraphs.

What has been briefly observed here can be considered the cause of an undisputed trend. If regulation in the criminal area tends to follow (not to precede) social changes, the digital turn occurred out of (and before) a specific legal framework. This implies that the digital advancement has been taking place in the absence of a back-ground research on the risks it may entail to the area of the core values of the society, usually protected by criminal law. Moreover, for a long time, the development of digital solutions overlooked the specific needs of criminal justice: existing (and pre-existing) technology dripped onto (almost every) criminal justice systems, providing availability of methods and solutions having been tailored for different purposes and not expressly fitted for the judicial use.

In particular, the computational revolution meant availability of enormous quantity of free data, constantly generated by digital devices, powerful computational resources, being able to mine uncountable amounts of data in few seconds and ever cheaper storage costs.¹⁰ Such conditions (quintillions of data and cheap, unprecedented computational power) set the premises for offering, also to the criminal justice systems, useful facilities, even though not specifically tailored for the task.¹¹ The digital turn provided not only full ranges of data, that can be used as evidence in criminal proceedings, but also new investigation systems, based on mining and analysing huge sets of available data (private or not; personal or not). Not only full digitalisation of courts' decisions, with unrestricted access to any case-law, but also more or less sophisticated software for the analysis of it, to find patterns of predictability within judicial decisions. Moreover, the availability of an unprecedented amount of digital data shifted the attention from a code-based modelling system (code-driven regulation),¹² totally deterministic - in which the discretion

¹⁰ Katz Daniel M., *Quantitative Legal Prediction, Or- How I Learned to Stop Worrying and Start Preparing for the Data-Driven Future of the Legal Services Industry*, in *Emory Law Journal*, 2013, 909-966, p. 916.

¹¹ Floridi Luciano, *cit.*, 41.

¹² For the distinction between code-driven and data-driven regulation, see Hildebrandt Mireille, *Algorithmic Regulation and the Rule of Law*, *Philosophical*

is encrypted in the expert-designed code, establishing that If This, Than That – to a deep-learning modelling system, non-deterministic, in which the discretion lays in the choice of the data set (data-driven regulation) of legal texts to be used to train the system.¹³

All this happened without a proper and effective confrontation between computer scientists, leading the sensational digital revolution, and criminal law experts. Also the legal literature confirms this impression, testifying of a growing attitude, especially in the U.S., of private law to focus on the theoretical challenges inherent the application of automation and artificial intelligence to the everyday-life, since Lawrence Solum's seminal article in 1992,¹⁴ accompanied by a slower trend in criminal law, and in criminal procedure.¹⁵ To some extent, this matches with the premises from which I moved, it is to say, the connate feature of criminal law to following rather than preceding (or progressing with) social changes...¹⁶

2. REALISM V. DYSTOPIANISM

It is essential, for the goal of this work, to understand how much of the mistrust and fears of (European) criminal lawyers towards the most recent digital instruments is due to the fact that they (allegedly) bring automated decision making processes into criminal justice or, rather, that

Transactions of the Royal Society, 2018, p. 2, 3.

¹³ There is no room here for reconstructing the evolution of AI applied to legal issues. For a general overview, See Rissland Edwina, Ashley Kevin D., Loui R.P., *AI and Law: A fruitful synergy*, in *Artificial Intelligence*, 2003, Special Issue, 2.

¹⁴ Solum Lawrence, *Legal Personhood for artificial intelligences*, in *North Carolina Law Review*, 1992, p. 1231-1288

¹⁵ Nieva Fenoll Jordi, *Inteligencia artificial y proceso judicial*, Marcial Pons, Madrid, 2018, 33 ff.

¹⁶ This attitude has been recently studied under the sociological point of view: see Christin Angèle, *Algorithms in practice: Comparing web-journalism and criminal justice*, in *Big Data and Society*, 2017 (July-December), p. 1-14. Based on his empirical research in American local criminal courts, the author concludes that "in criminal justice innovation does not come with the glitter and appeal that it has in other sectors: it is often a source of uncertainty, as innovation arrives without the vetting of precedent".

they bring algorithmic decision making-processes into it. Let's clarify this statement, that may sound slightly tautologic.

2.1. THE COMPLEXITY OF ALGORITHMIC DECISIONS

According to a quite common definition,¹⁷ “*Algorithms need not be software: in the broadest sense, they are encoded procedures for transforming input data into a desired output, based on specified calculations. The procedures name both a problem and the steps by which it should be solved. Instructions for navigation may be considered an algorithm, or the mathematical formulas required to predict the movement of a celestial body across the sky*”. Thus, algorithms, like syllogism – the most traditional instrument of judicial reasoning - have a normative function, establishing correlations between a starting set of elements or data, and a precise consequence. Which is the place, then, of algorithms in a judicial proceeding? They not necessarily are incorporated into a software and, moreover, not necessarily are operated automatically: in this sense, it is necessary to move from a conceptual clarification, distinguishing, between different levels of complexity. In fact, in my view, three aspects - validity of the scientific theory; translation of the theory into algorithmic language; fully automated operation of the algorithm – are involved in the application of computational modelling in judicial proceedings, and confusing them may be detrimental for finding effective solutions to the problems tackled here.

From a conceptual point of view, a judicial proceeding and, in particular, a criminal trial, is a process to establish whether and how a fact occurred (*actus reus*), if such fact has criminal relevance (*mens rea*), if the defendant perpetrated it and, in such case, provided that the individual is punishable, which is the just penalty to be imposed. This reconstruction follows a flow that is opposed to scientific investigation: while the latter moves from the observation of a set of conditions, trying

¹⁷ Gillespie Tarleton, *The relevance of Algorithms*, in T. Gillespie, P. Boczkowski, K. Foot, *Media Technologies*, MIT Press, Cambridge US, 2014, 167. Such definition has been recently adopted by the study delivered by the Council of Europe on Algorithms and Human Rights: see <https://rm.coe.int/algorithms-and-human-rights-en-rev/16807956b5>

to explain which are the consequences deriving from them, the judicial decision moves from the consequences (the criminal act) backwards, trying to reconstruct the set of conditions that may have caused the fact. Causality has always been and still remains the core of criminal law, implying the existence of a universal scientific rule or, at least, a validated scientific theory, explaining, beyond any reasonable doubt, the narrative of the criminal fact.

How the recent astonishing achievements in IT and AI impact on such scenario? The answer implies, as said, three steps.

The first layer of complexity encompasses the existence of a universal scientific rule or, at least a validated scientific theory establishing correlations between a set of factors and a precise consequence. Traditionally, it is said that causality should be preferably proved on the basis of a universal rule, establishing that, given A, B will always be the result. However, in light of the achievements of modern science, it is arguable that universal scientific laws do exist at all... In any case, when courts cannot rely on such strong correlation, they must recur to non-universal rules, allowing a certain margin of doubt, at least at the time being. It falls out of the scope to linger over the burgeoning literature focusing on the relationship between science and criminal law: however, although not being the focus of our speculations, this topic is entrenched into the general theme of AI and criminal proceedings, and cannot be overlooked.

It is well-known that, the US Supreme Court delivered a decision in the 90's of the last century that tends to be considered seminal in many jurisdictions, even outside the country, in civil-law legal orders. *Daubert v. Merrel Dow Pharmaceuticals*¹⁸ established a list of basic standards that the courts, throughout the world, still apply in order to admit evidence based on scientific (or technical)¹⁹ theories. Thus, when reflecting upon the use of computational models in a judicial decision-making process (either at the pre-trial stage, in trial or at sentencing), it must be acknowledged that the first layer of complexity is represented

¹⁸ *Daubert v. Merrell Dow Pharmaceuticals* (92-102), 509 U.S. 579 (1993).

¹⁹ In fact, *Kuhmo Tire* extended the *Daubert* test to technical evidence (*Kumho Tire Co. v. Carmichael* (97-1709) 526 U.S. 137 (1999)).

by the underpinning scientific theory. A computational model must be rooted into a theory and such theory must meet minimum requirements of validation, according to the peers' community.

The second layer of complexity is consequential, because the results of such scientific theory may be encoded into an algorithm. Acknowledging the definition given above, algorithms design a normative procedure that moves from a set of data towards a desired output, excluding subjective intuitions and arbitrariness from the process. Insofar, it represents a mathematic model,²⁰ that can be operated by a human being, even in a criminal proceeding, provided that it is based on a sufficiently validated theory and that such theory has been correctly encoded into the algorithm. These two requirements are crucial. In fact, a 'reverse control' on coding is fundamental, because the possibility of reviewing, discussing, challenging the results of an algorithm is a basic condition for a fair decision process and, thus, for a fair criminal proceeding, compliant with fundamental human rights.

The third layer of complexity lays in the fact that the digital turn established two basic and ideal conditions to boost the use of algorithms in every kind of decision-making process. In fact, the stunning amount of data produced (for free) daily by digital devices and the extraordinary and unprecedented computational power now available at a very low cost, represent the ideal context in which algorithms can deliver the most effective results.²¹ An algorithm operated by a human being will process a small amount of data, in a relatively long time, delivering few outputs. The same algorithm, operated through a computational model will mine uncountable data in few seconds, delivering an enormous amount of outputs. In this sense, "the use of robots and AI, therefore, is just a special case of the Algorithmic Society. Big Data, too, is just a feature of

²⁰ For an easily-accessible definition of 'models', see O'Neil Cathy, *Weapons of Math Destruction*, Penguin, Allen Lane, London, 2016, § 7.12: to create a model implies making choices about what is important to include into it or not.

²¹ See, in general, the remark by Zedner Lucia, *The inescapable insecurity of security technologies?*, in K. Franko Aas, H. Oppen Gundhus, H. Mork Lomel, *Technologies of Insecurity. The surveillance of everyday life*, Rutledge-Cavendish, Oxon, 2009, p. 257-270 p. 257: "Enormous trust is placed in the capacity of technology to surmount the gravest challenges to our well-being and happiness". "Techno-credulity is widespread".

the Algorithmic Society. Big Data is the fuel that runs the Algorithmic Society... To vary Kant's famous statement, algorithms without data are empty; data without algorithms are blind".²²

Thus, it is possible to argue that, on the basis of the above-mentioned conditions, algorithms, in their essence of normative, mathematical statements/relations, are gaining momentum over subjectivity at the present day²³. An algorithmic decision-making process is (or ought to be) opposite an arbitrary one, granting – theoretically - objectivity, accessibility and, ultimately, fairness.²⁴ However, accessibility implies transparency and transparency is not an innate quality of algorithms. On the contrary, a substantial literature has been focusing on the problem of algorithms' opacity, a condition in which the encoded procedure cannot be validated *ex post*, and thus its results cannot be (even not) explained (and, consequently, not justified).²⁵

Having clarified these concepts, it is possible to set a first cornerstone of this study. The need for accessibility is the quintessential aspect in the discourse about the use of algorithm in decision-making processes, both in private and public context. Such accessibility, or transparency, acquires specific implications when it comes to the judicial decision-making process and, in particular, to the criminal trial one. Thus, transparency is the constant issue behind the discourse about the application of algorithms and AI systems to criminal justice. Reflecting on the meaning of such concept, a very crucial distinction has been drawn between explanation and justification.²⁶ In this sense, much depends, in

²² Balkin Jack M., *The Three Laws of Robotics in the Age of Big Data*, in SSRN 2016, at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2890965

²³ Plesničar Monika M., Sugman Stubbs katja, *Subjectivity, Algorithms and the Courtroom*, in A. Završnik (ed.), *Big Data, Crime and, Social Control*, Rutledge, Abingdon, 2018, (ebook) § 22.37.

²⁴ The validity of such argument relies on the possibility to really eradicate human biases rather than camouflage them with technology: C. O'Neil, cit., § 7.38.

²⁵ Geslevich Packin Nizan, Lev-Aretz yafit, *Learning algorithms and discrimination*, in W. Barfield, U. Pagallo, *Research Handbook on the Artificial Intelligence and Law*, Elgar, Cheltenham, 2019, 88 ff.

²⁶ See recently Hildebrandt Mireille, *Algorithmic Regulation*, cit., 2. (The topic has been deeply debated with regard to the provision of art. 22 GDPR,

the first instance, on the precision of the scientific theory underpinning it and, in the second instance, on the clarity of the language used to translate it into a mathematic formula. To comply with the requirement of explanation, it seems to me that the latter quality is sufficient: a clear mathematic language allows an *ex post* reviewer to understand how the process evolved from the inputs to the outputs. However, to satisfy the need of justification, the underpinning scientific theory must be valid enough to provide a causality relationship between the set of input data and the outputs ('validity' is intended here in the sense provided by the US Supreme Court in the mentioned case of Daubert).

In the light of the previous arguments, it is possible to set also a second cornerstone for this enquiry. Regardless of the different realms of the criminal proceeding in which computational models and AI could be applied, the general impression is that, allowing for the use of the most recent digital achievements in criminal proceedings may deprive courts of their discretion (and the parties of their rights). Delving on this common opinion, two main aspects must be taken into consideration.

First. Irrespectively the correctness of such opinion, what should be ultimately suspected of depriving judges of their power is not 'the machine', rather the algorithm. As said, the normative approach of mathematical modelling is supposed to objectivise a decision process, reducing non-objective criteria or indexes, based on personal culture, biases, shortcuts²⁷ and contingent conditions. However – second - the algorithmic reasoning is opposed to arbitrariness, not necessarily to discretion. In this sense, the aspiration of introducing algorithms in all sorts of decision-making processes is understandable. In the public sector,

about automated individual decision making, including profile: see Wachter Sandra, Mittlestadt Brent, Floridi Luciano, *Why a Right to Explanation of Automated Decision-Making Does not Exist in the General Data Protection Regulation*, *International Data Privacy and Law*, 2017, p. 1 -47).

²⁷ There is extensive literature on heuristics in judicial decision making process. See, in general, the leading text of Kahneman Daniel, Slovic Paul., Tversky Amos (Eds.), *Judgment under uncertainty: Heuristics and biases*, New York 1982, Cambridge University Press.; more recently, Cevolani Gustavo, Crupi Vincenzo, *Come ragionano i giudici: razionalità, euristiche e illusioni cognitive*, *Criminalia* 2017, p 181 ff, 182.

such ambition is urged by the need (and the duty, in some jurisdiction)²⁸ of granting an impartial and fair administration, in any branch of it. In the private sector, excluding arbitrariness in strategic decision, such as hiring one applicant or another, may prove essential in gaining more profit.²⁹ Nevertheless, two variables must be retained. On the one hand, algorithms can help in achieving such legitimate goals at the conditions mentioned above (first cornerstone): they must underpin a valid theory and be transparent, otherwise they cannot provide impartiality or profit. On the other hand, allowing for the use of algorithms does not imply taking out any discretion from the decision process:³⁰ there is room for the rulers to regulate the interaction between algorithms and human intuition in a way that does not deprive the process of discretion. This argument is particularly valuable in those contexts in which fundamental rights – such as the one to a fair trial - are in jeopardy and the outcomes of the decision-making process may impact significantly on the individuals' condition (such as the nature and the amount of penalty, depriving them of liberty or even life). Someone may argue that discretion is a risk, rather than a value, when fundamental rights are at stake... Actually, other forms of intelligence, like the artificial one, proved to perform better than the human intuition, in many areas... could this be the case also with judicial decision? Preliminarily, it is worth asking if and how it is possible to scale 'better performances' in judging human criminal behaviour. What would 'better' mean? 'More consistent'? Of course, basic systems of AI can grant high levels of consistency... However, it is questionable if and how far such consistency is a value in criminal proceedings. In fact, as said, courts ruling upon an individual's criminal liability do not perform a scientific or technical process. Judging, in general, and sentencing, in particular, are human tasks not just because they are performed by humans,³¹ but because they are intended to be received, understood and accepted by

²⁸ See, e.g. Art. 97 of the Italian Constitution, providing for the duty of impartiality in every branch of the public administration.

²⁹ With specific regard to law firms, see Katz Daniel M., cit., p. 934.

³⁰ See Morozov Evgeny, *To Save Everything, Click Here*, Penguins, Allen Lane, London, 2013, § 11.30 (ebook)

³¹ See Plesničar Monika M., Sugman Stubbs Katja, *Subjectivity*, cit., § 22.14.

the community:³² crime is a social construct³³ and the social acceptance of a decision, rather than consistency, is the ultimate task of delivering justice. In this sense, the need for discretion in all the areas of judicial decision (criminal liability, penalty, but also admission and evaluation of evidence) is inherent to the judicial function itself.

For these reasons, the legal discussion must be framed in such terms to detect (and avoid) the conditions in which the use of algorithms can suppress discretion, along with arbitrariness. For example, such situation may happen to occur when algorithms are operated in a totally automated way, without any human intervention. Similar conditions may prove to be detrimental for the fairness of criminal proceedings and, in particular, for the rights of the defence. But this is not a necessary condition. The suppression of the judge's and parties' prerogatives may be a consequence of the characteristics of the algorithm in itself and not of the fact that it is performed by a machine. This distinction is not barely formal. It is part of the necessary premises to address the topic of computational model, AI and criminal law under a legal point of view, because it is inherent to the definition of the risks that need to be considered here.

To summarise, algorithms, incorporated into computational models or not, are pushing on our systems of criminal justice, pledging high rates of efficiency. However, as said, technical and scientific efficiency is a parameter that does not belong to justice. Thus, reliability, accuracy, trustworthiness of such instruments should not be measured only in the terms of computer science:³⁴ the same concepts have specific meanings in the realm of criminal justice, and they cannot be overlooked. For these reasons, the existing digital methods, having been applied in criminal proceedings - with or without a proper framework

³² See the very famous Introduction of Cardozo Benjamin N., *The nature of the Judicial Process*, Yale University Press, New Haven, 1921, p. 10: "What is that I do when I decide a case? (...) Some principle, however unavowed and inarticulate and subconscious, has regulated the infusion".

³³ See Spector Malcom, Kitsuse John I., *Constructing Social Problems*, 2nd ed., Routledge, London, 2000.

³⁴ Završnik Aleš, cit., § 21.2 warns about the fact that "what counts as 'proper', effective and efficient police work and judicial decision-making has changed"...

of legal regulation - of many jurisdictions, should be reviewed from the legal perspective.³⁵

2.2. THE PROTECTION OF FUNDAMENTAL RIGHTS

The European countries have strong constitutional traditions. Based on this, the Council of Europe was able to promote the signature and the ratification of the European Convention of Human Rights and the acceptance by the member States of the individual application to the European Court of Human rights. Moreover, the common constitutional traditions are considered a legally binding source of the EU law. Many of those constitutions, along with the ECHR and the Charter of fundamental Rights of the EU, regulate justice, often setting forth specific principles referred to criminal justice. In this sense, the ECHR, the EU law (within the area of the Union competence), and the national constitutions represent a legal filter for any attempt to introduce the use of computational means into criminal proceedings. Nevertheless, the approach to the matter must be neutral: scholars must not move from the prejudice that the use of such means *is* inconstant with fundamental rights... The purpose of a useful study is to assess whether their application may violate some of the principles enshrined in the ECHR. To this aim, it is crucial to establish a shift of perspective: as said, computational models and instruments, software and programs are usually assessed in terms of technical reliability, scaling their performance on the basis of the aspiration to exclude errors or inaccuracy. However, for the reasons summarised above, the endeavour to hybridise (criminal) justice with such means cannot respond to the sole criterion of efficiency. Actually, efficiency, *per se*, is even not expressly mentioned in Art. 6 ECHR. On the contrary, such means should be confronted to the traditional and fundamental principles regulating law enforcement, both in investigation, in trial and in sentencing. The fundamental guarantees set forth by the ECHR, such as the right to private and family life, the presumption of innocence, the equality of arms, must be used as parameters to assess the lawfulness of using automated

³⁵ Završnik Aleš, cit., § 21.28: These methodologies, are not developed for the study of society, in the manner that statistics in modernity was.

instruments within criminal proceedings or, better, the conditions for a lawful application of it.

Such theoretical approach seems crucial to establish a useful legal discussion in these terms, before rulers fall into the ‘digital fascination’. For the reasons that will be sketched out hereinafter, there is a considerable gap between a certain number of common-law countries and Europe, and the latter is still in the phase of ‘approaching the topic’. Enumerating the list of digital solutions already adopted in other jurisdictions, acknowledging their existence and, maybe, their performing rates is not enough. It is important to address the problem under the right point of view, that seems to be that of fundamental rights: are such instruments compatible with the presumption of innocence? Are they respectful of the equality of arms? Are all of them compliant with the protection of the right to private and family life within the context of criminal proceedings? An inaccurate analysis of the problem, may lead to endorse computational solutions that, in the long term, may prove even highly inconstant with the essence of fair trial. Allowing such situation would be painful for individuals and, redressing it, extremely challenging for rulers.³⁶ It is better to adopt a neutral approach and reflect on it before flaws hit the fundamental rights of individuals.

3. CRIMINAL LAW V. PREVENTION OF CRIME

Based on the previous remarks, it is possible to list some specific topics on which the criminal law scholarship should focus.

Frist and foremost, the union of ‘AI’ and ‘Criminal Law’ suggests a dystopic scenario of extremely intrusive means of surveillance, aimed to prevent crime.³⁷ However, surveillance and prevention fall out of the scope of Criminal Law. The latter regulates the elements of crime

³⁶ In a general sense, see Morozov Evgeny, cit., § 11.27: “who would be crazy enough to oppose the march of science and suggest that perhaps some of those products need to be modified?”

³⁷ See Franko Aas Katia, Oppen Gundhus Helena, Mork Lomel Heidi, *Introduction*, in K. Franko Aas, H. Oppen Gundhus, H. Mork Lomel, *Technologies of Insecurity. The surveillance of everyday life*, cit., p. 3.

and the consequences of its perpetration. Thus, a criminal proceeding may exist only after a crime has (allegedly) occurred. In this sense, this enquiry is limited to the use of computational models and AI in criminal proceedings and not in policing.

Nevertheless, more and more LEAs are equipped with software predicting where and when crimes are more likely to occur.³⁸ Recently, the Italian main newspapers reported with great fanfare the introduction of the so called “X Law” software, enabling a more accurate patrolling of the neighbourhoods, on the basis of a set of statistic data. Instruments of ‘predictive policing’³⁹ have been used since a long in many jurisdictions.⁴⁰ Setting aside the fascination for it⁴¹ (the Italian journals reported the immediate result of an on-site arrest), such software already demonstrated their limits, ‘self-realising’ their predictions: in fact, indicating an area as the potential site of crime, will *per se* raise the arrests rates, as more LEA units will be monitoring *that* area. However, the effectiveness of such systems is not an object of this study, because this is not an area of criminal law, and even less of criminal proceedings.

Inherently, the area of prevention of crime and policing – deeply intermingled with intelligence - tends to escape to rigid and precise regulation⁴². Constraining it into strict boundaries would condemn it

³⁸ See. Završnik Aleš, cit.

³⁹ See extensively, Wilson Dean, *Algorithmic Patrol*, in A. Završnik (ed.), *Big Data, Crime and, Social Control*, cit., § 19.3

⁴⁰ See the trial results of Mohler George, Short M.B., Malinowski Sean, Johnson Mark, Tita G.E., Bertozzi Andrea L., Brantingham P.J., *Randomised controlled field trials of predictive policing*, in *Journal of the American Statistics Association*, 2015, vol. 510, p. 1399-1411, of an algorithm based on data from American and British jurisdictions about different kind of crimes. In 21 months of testing the algorithm against specialised analysts, the results showed the first being between 1,4 and 2<2 times more accurate than the latter. The group was not totally independent, as two of the members co-founded the company that would commercialise the algorithm, while others served as external counsels for the company.

⁴¹ Završnik Aleš, cit., § 21.13 devotes a paragraph to “crime control and the fascination with numbers”.

⁴² However, some countries, like Italy, have a long tradition in providing preventive measures, not based on an alleged crime, but actually to avoid the commission of it...

to be less effective... As prevention is a different and autonomous area of criminal justice, the attention here is focused on the specificity of criminal law.

3.1. THE SPECIFICITY OF CRIMINAL LAW

Many of the reasons justifying a criminal law approach to the topic have been anticipated in §§ 1 and 2. Because of the values underpinning this area of law, much attention has been paid to it, in the last decades, especially in the second World War aftermath. The idea of recognising the fair trial as a fundamental human right, with some of the most important international bills of rights - such as the International Covenant on Civil and Political Rights and the several regional conventions on human rights – was crucial in strengthening the culture of procedural guarantees, within any branch of the jurisdiction. However, it is with regard to criminal proceeding that the rulers developed the most articulated list of guarantees, establishing the presumption of innocence, but also a very detailed list of minimum standards, deeply influencing the shape of national jurisdictions: from the basic right to access to justice, to the right of having free linguistic assistance, the provisions of the ICCPR and, in particular of the ECHR (thanks to the living-instrument doctrine⁴³ adopted by the European Court of Human Rights, hereinafter, ECtHR), set forth a relatively strict frame for national legislators. It falls out of the scope of this study to linger over the effective level of harmonisation achieved by the ECHR and by the burgeoning case-law of the Court on criminal fair trial: actually, the real domain of criminal law matters reaches far behind Art. 6, covering, in the broadest sense, also art. 7 (*nulla poena sine lege*), art. 8 (right to private and family life), art. 5 (right to liberty and

⁴³ Based on a precise reference inserted in the preamble of the Convention - according to which, “the object and the purpose” of the ECHR is not only the maintenance, but also the “further implementation” of human rights and fundamental freedoms, the Court started promoting (since the case of *Golder v. UK*, 21.2.1975) an evolutionary approach, rejecting any originalistic theory in the interpretation of the document. See, Emmerson Ben, Ashworth, Andrew Macdonald Alison, *Human rights and Criminal Justice*, 3rd ed, Sweet and Maxwell, London, 2012. p. 82. 5

security) and arts. 2 and 3, in their procedural aspect (duty to set up an effective investigation on potential violations, respectively, of the right to life and of the prohibition of torture). On the one hand, the wording of the convention regulates, itself, a range of aspects related to the whole criminal proceeding, from the investigations and pre-trial detention, to the execution of penalties, encompassing the principle of legality. And even though the charter does not provide for a precise statute of criminal evidence, Art. 6 (and 8) ECHR establish some crucial benchmarks in the collection and evaluation of it, considered by the ECtHR itself,⁴⁴ the realm of national legislators' discretion. On the other hand, as far as the States recognised the right of individuals to apply the Commission - and, eventually, the Court – the Strasbourg case-law started building the wider scheme of a convention-compliant criminal proceeding, that any national ruler must take into account.

The reasons for such comprehensive attention for the criminal jurisdiction are many. In § 1 I highlighted some of the most general features of criminal law, based on which it is possible to argue that criminal law and criminal proceeding can easily be turned into an offensive instrument, punishing and crushing the opponents, the enemies, the weaker, the non-mainstreamers.⁴⁵ In fact, basically, criminal law is about the legitimate use of violence by the State.⁴⁶ So far, a modern bill of rights cannot overlook the importance of setting strong and precise limitations to the rulers' discretion to regulate criminal affairs, in order to prevent such illiberal outcomes.

Moreover, with the entry into force of the Lisbon Treaty, ten years ago, the European Union experienced both a profound reform of its legal sources and the rationalisation of its competence, acquiring a much detailed and penetrating power in criminal matters, substantive and procedural. Both art. 82 and 83 of the Treaty on the Functioning of the

⁴⁴ See, recently, ECtHR, *Svetina v. Slovenia*, 22.5.2018.

⁴⁵ See MacCormick Neil, Garland David, *Sovereign States and Vengeful Victims: the Problem of the Right to Punish*, in A. Ashworth, M. Wasik (eds.), *Essays in Honour of Andrew von Hirsch*, Clarendon Press, Oxford, 1998, p. 11-29, p. 28.

⁴⁶ Duff Antony, Garland David, *Introduction: Thinking about Punishment*, in R.A. Duff, D. Garland (eds.), *A Reader on Punishment*, Oxford University Press, 1994, p. 2 ss.

EU (hereinafter, TFEU) establish that, by means of directives, according with the ordinary legislative procedure, the Union can lay down minimum rules about: (art. 82§2), mutual admissibility of evidence in criminal proceedings; rights of individuals in criminal proceedings; rights of victims of crime; (art. 83), the definition of criminal offences and sanctions in the areas of particularly serious crime with a cross-border dimension and the approximation of criminal laws and regulations of the Member States if it proves essential to ensure the effective implementation of a Union policy. As a result, in the past decade, a long list of directives was adopted under art. 82§2 to strengthen the procedural rights of the individuals in criminal proceedings. Some of the guarantees already provided by the ECHR have been reiterated in the legal vest of directives - submitted to the interpretation of the CJEU – that the members States have the duty to implement in their jurisdiction, under the consequences provided for in art. 258 and 259 TFEU.

Thus, within the European institutional environment, much attention is paid to the criminal proceedings, as many fundamental rights concentrate in it, the accused person's ones and the victims' ones, at the same time. For this reason, the discourse about the introduction of algorithmic, computational models and AI in the area of criminal proceeding is submitted to the 'filter' of such a rich core of fundamental rights. Behind it, lays the filter of the national regulation, that in some cases is even stricter. In fact, as said, at the national level, the fairness of the proceedings may acquire also another meaning: beyond the interest of the defendant (or the victim), it may be considered an objective guarantee, not only satisfying the defendants' personal interest (actually, they could consider more consistent with their strategy to waive all their rights and accept unfair trial), but also the general interest to the objective fairness in the administration of criminal justice. Despite the opinion and the strategy of the defendant, the system cannot allow unfair criminal proceedings, as this would be inconsistent with its own institutional nature.⁴⁷

Having excluded the area of policing and prevention of crime from the scenario considered here, and highlighted the existence of a

⁴⁷ See Ferrua Paolo, *Giustizia del processo, giustizia della decisione, Diritto penale e processo*, 2015, 1201 ss.

comprehensive framework of European guarantees surrounding the whole criminal proceeding, it is worth pointing out which aspects of the latter may be more closely affected by the use of computational modelling and AI. Having regard, especially, to the northern American experience - that seems to be the one incorporating most extensively algorithmic and digital solutions in the realm of criminal justice – such tools impact on many phases of the criminal proceeding, from the investigation to the sentencing and the execution of penalties. In the American experience, there seem to be patterns repeating in different stages of the proceeding. In fact, within the considerable span of a proceeding, algorithmic and computational models seem to respond to two main tasks.

First task: a more effective collection of information, to be used either in the investigation and/or as evidence in the trial stage. In this sense, the digital turn offered the LEAs and prosecutors many advantages: an uncountable amount of data to be hacked; much more intrusive hacking systems; a range of information provided by the IoT, 'ready' to be used as evidence in trial. This is the area in which the European criminal justice scenario has been more deeply penetrated by digital solutions. In fact, in many jurisdictions, LEAs simply started using hacking systems to replace traditional interceptions, searches and seizures, almost without a specific regulation. The LIBE Committee (Civil Liberties, Justice and Home affairs) of the European Parliament commissioned a study about Legal Frameworks for Hacking by Law Enforcement: Identification, Evaluation and Comparison of Practices, delivered in March 2017 by the European Parliament's Policy Department for Citizens' Rights and Constitutional Affairs. The conclusions of the very comprehensive document focuses the attention on the same crucial aspect highlighted here above. On the one hand, the "discussions that have addressed this topic to some extent have primarily focused on the surveillance activities of the security and intelligence services", and not on the judicial aspect of hacking. Moreover, "these international-level discussions start from the point of view where surveillance activities are necessary and simply require governing laws" [...]: "however, the using of hacking techniques and the implementation of specific legislation at the national level should be subject to EU and international fundamental rights principles. [...] The right for law enforcement agencies to use

hacking techniques should not be assumed but must be deemed necessary within the specific context of a Member State”.

Traditionally, this is the area of interaction between criminal proceeding and individual's sphere of private life. In fact, although being extensively protected by one of the most comprehensive regulations in the world (the GDPR), privacy is not an absolute right, even in the European context. When compared with other fundamental interests of the society, such as (in this case) the prosecution of crime, it can be lawfully limited: privacy has its own dimension within criminal proceedings and this is regulated both by the ECHR and the EU law. However, using digitally generated (or hacked) evidence in criminal proceedings may also hinder another fundamental right, to a fair trial: actually, it may violate both the right to a fair trial and the one to private life. In fact, the opacity of the algorithms regulating hacking instruments and other digital devices, generating evidence, may prevent the defence from challenging the accuracy and reliability of it. This can hamper one of the basic aspects of the fair trial, it is to say the equality of arms, that, in its basic meaning implies the right of the parties to challenge the opponent's evidence, not in a theoretical, but in an effective way.⁴⁸

Second task: algorithms and computational models proved useful in several stages of the judicial decision-making process. On the one hand, based on their stunning computational power, such instruments can rapidly mine quintillions of statistic data, helping to establish correlations between the individual's and a social group's behaviour and, apparently, to predict future actions, such as violations of bail conditions or parole or recidivism. On the other hand, thanks to that very same feature, open access digital instruments allow for the complete accessibility of any judicial decision delivered within a jurisdiction and for the searching by key-words (or concepts, with regard to the most recent technical achievements)⁴⁹. Designers of such software claim that the result is

⁴⁸ Pagallo Ugo, Quattrocolo Serena, *The Impact of AI on Criminal Law and its twofold procedures*, in W. Barfield, U. Pagallo, *Research Handbook on the Artificial Intelligence and Law*, Elgar, Cheltenham, 2019, 400.

⁴⁹ Sobowale Julie, *How artificial Intelligence is transforming the Legal profession*, *ABA Journal*, April 2016, referring to NexLP (private company leading the sector) most recent products.

predictability of the decisions, taking into account any individual judge's variables inclinations. In the US, specialised journals often refer to the so called 'science of quantitative legal prediction'. For example, it has been said that trying to predict the Supreme Court decisions seems to be one of the most popular hobbies, at least among politicians and journalists, with very scarce success... But, as the impact of the Court's decisions is crucial for the society as a whole, it seems worth producing accurate models, scoring very high levels of accuracy⁵⁰... Quantitative legal prediction claims to respond with a stunning approximation, to such need.

In this sense, it is possible to argue that the digital turn is promoting predictability as the major feature and aim, at the same time, of criminal justice. On the one hand, predicting defendants' future behaviour; on the other hand, predicting judges' behaviour and decisions. However, the question is whether predictability has an 'autonomous concept'⁵¹ within the realm of criminal law that does not align with the popular meaning of the term.

3.1.1 Moreover, the issue is also related to some of the most crucial and essential aspects of any legal order: the statutory nature of a jurisdiction (impinging on the relationship between judges and the law); the structure of judiciary (regulating the different levels of the jurisdiction and the relationship between lower and superior courts and the role of the latter in assuring the uniformity of the interpretation);

⁵⁰ See Katz Daniel M., Bommarito Michael J. II, Blackman Josh, *A general Approach for Predicting the Behaviour of the Supreme Court of the United States*, in SSRN, 16.1.2017

⁵¹ The term 'autonomous concept' is familiar to the European readers, having been extensively used by both the European Court of Human Rights and the Court of Justice of the European Union. The term indicates that, in the context of these two domains, a notion, applying also in the national jurisdictions, encompasses (also) different aspects and elements. The most known example is the notion of 'criminal charge', having been considered by the court an autonomous concept since the case of Engel and others v. The Netherlands, 23.11.1976. For an interesting approach to 'autonomous concepts' see G. Letsas, in *European Journal of International Law*, 2004, 279-305. As said, also the Court of Luxembourg often applies the interpretative tool of autonomous concepts (sometimes overlapping with those developed by the Court of Human Rights).

the value of the precedent (imposing boundaries on the judges' freedom to divert from it); the concept of 'similarity' between two cases (being the condition to apply *stare decisis*)... The general accessibility to the whole body of decisions in a jurisdiction may seriously impact on two basic characters of the latter. On the one hand, legal systems being not regulated by *stare decisis* – like the majority of the civil-law countries – may witness a shift towards a different pattern, imposing on the courts a duty of specific reasoning in case of over-ruling. The social expectations for full consistency with the 'predicted decision' may urge judges to feel uncomfortable in departing from it, seriously impinging on the independence of judiciary.⁵² Moreover, mining a mass of data, predictive models may not distinguish between lower courts and superior courts' decisions, hampering the institutional structure of justice itself... These are all crucial aspects in determining the concept and the value of predictability, being deeply rooted in the most inherent aspects of the common-law and civil-law traditions. As such, they affect all branches of a legal system, and not only criminal justice. However, the concept of predictability has a specific meaning within the modern conception of the principle of legality. The theory of predictability of criminal commands and penalties moves from the liberal theory of criminal law and finds a beacon in the famous Bentham's critique of the British judges.⁵³ Men can understand the consequences of their behaviour and are able to self-determine: for these reasons, the rulers must put them in the condition to foresee, clearly and surely, the penal consequences of a behaviour before putting it into action.⁵⁴ It is worth asking whether this is the very same aim and function promised by computational models mining and analysing all the decisions in a jurisdiction, searching for patterns of correspondence between decisions and judges' behaviour.

These arguments confirm the specificity of the realm of criminal justice within the general context of 'legal AI'. Criminal law and criminal

⁵² See the European Ethical Charter for the Use of AI in the systems of justice. Annex II, delivered in December 2018 by the CEPEJ (Council of Europe).

⁵³ Bentham Jeremy, *Works*, V, edited by J. Bowring, Edinburgh 1843.

⁵⁴ Cadoppi Alberto, *Il valore del precedente*, cit., p. 65 s.

proceeding are a branch of regulation in which the issue of the use of computational modelling and AI need to be addressed specifically.

3.2 THE SPECIFICITY OF EUROPE

A second aspect of specificity is geographical. There exist a lag between the US (and some others common-law jurisdictions, such as some Australian ones)⁵⁵ and Europe, under the view-point of massive reliance on digital solutions in justice systems.⁵⁶ Over two decades,⁵⁷ new branches of research and scholarship developed in the US, often bringing computer scientists and, in particular, modelling developers, to see a potentially rich new market for their software in the realm of justice...⁵⁸ and Europe seems to be a virgin soil.⁵⁹ In fact, at the time being, “the use of predictive tools in criminal trials is very rare in Europe”⁶⁰ as many other algorithmic instruments are,⁶¹ and there is room to set up a legal discussion, before the market rules overarch any effective possibility for it.

⁵⁵ See the Australian Report in the study, *A framework for hacking by law enforcement*, cit., p. 111.

⁵⁶ For a complete overview of American leading law-firms having turned to technological resources for the accomplishment of traditional tasks, Li Victor, *Techtrekkers*, *ABA Journal*, April 2016, p. 37-43.

⁵⁷ See Sobowale Julie, *Beyond Imagination*, *ABA Journal*, April 2016, p. 47-53, p. 47: “the future of legal professions started twenty years ago”, referring to Discovery Cracker, the first software for legal researches.

⁵⁸ The initiative of pinpointing instances of AI in judicial systems almost came from the private sector: see, European Ethical Charter for the use of AI in judicial systems and their environment. Appendix I, p. 14.

⁵⁹ See Sobowale Julie, *How artificial intelligence*, cit., reporting Adam Nguyen, EBrevia’s co-founder (supplying legal software based on machine learning), interest in covering the European market.

⁶⁰ See, European Ethical Charter, cit., p. 37: with the exception of HART (Harm Assessment Risk Tool), being under experimentation at the moment in some UK jurisdiction, there is no knowledge of other similar instruments.

⁶¹ See, e.g. S.F. Ward, *Doing It with Data*, in *ABA Journal*, September 2018, p. 38, about the so-called *Priori* system, a platform that pairs attorneys with clients based on detailed experience information. The service is free for the attorneys who agree to discount 25% hourly rates, while clients pay 10% of the reduction to *Priori*.

As to the reasons for such a lag, they seem to be multi-fold. The main element is that, the US represent, in the Western world, the country that most extensively invested in computational sciences, leading the digital revolution. Social and cultural issues are at the basis of such trend and they have been studied in several branches of scholarship. Under the economic point of view, a predominance of the private sector over the public one seems to having been the most relevant input. Similarly, the US scenario seems to be positively affected by the coexistence of strong private and public research sectors. This condition enhanced the development of a competitive environment, promoting a faster and wider application of computational modelling also in social sciences.⁶²

A second element is but legal, and it is twofold. First. The areas of private and criminal justice are inherently distinct in any jurisdiction, as the latter is mostly based on oral hearings. This is true also in the US.⁶³ However, the massive number of guilty pleas reduces remarkably the room for oral trials in front of the courts, reducing the oral activity at the disposition hearing, in which the judge delivers a decision on sentencing. This trend caused a 'bureaucratic effect', transforming the oral hearing – being traditionally the stage for intense, human performances, into a more bureaucratic proceeding, concentrating the judicial discretion in the sole moment of sentencing. In such a context, the need for a more efficient management of data became relevant, inducing an enlargement of the recurs to risk assessment methods.

Second. The turn of the American penal doctrine from a rehabilitative paradigm to the idea of 'just desert',⁶⁴ deeply influenced the discourse

⁶² See the comprehensive analysis of Susskind Richard, *The End of Lawyers?*, OUP, Oxford 2008; see also Katz Daniel M., *Quantitative Legal Prediction*, cit., pp. 909 ff.

⁶³ See Christin Angèle, *Algorithms in practice*, cit., p. 8 reporting an interview with a clerk in an American local court: "here at the criminal side it's messy... It's not like on the civil side. Lawyers, Das, they negotiate, they decide on the plea... They do not know what's going to happen. They scribble down notes on paper sheets, they couldn't switch to paperless!".

⁶⁴ See Dubber Markus, Hörnle Tatyaina, *Criminal Law. A Comparative Approach*, OUP, Oxford, 2016, 4. The same trend, however, affected also the English system: see Padfield Nicola, Morgan Rod, Maguire Mike, *Out of Court, out of sight? Criminal sanctions and non-judicial decision-making*, in M. Maguire, R.

about incarceration and inhabilitation, determining increasing rates of incarcerations.⁶⁵ This implied, on the correctional point of view, more room for the development of computational models meant to grant a more objective and effective management of the stage of the execution of penalties.

In Europe, the use of negotiated justice is not predominant. Although the majority of the European jurisdictions provide for some kind of negotiation between the prosecution and the defence,⁶⁶ almost based on a reduction of the sanction against a very early definition of the proceeding, the trial still represents the most common development in criminal cases, leaving room for oral hearings, with oral discussion and oral presentation of evidence... More unpredictable variables distinguish the typical European criminal court context from the American one. At the same time, European jurisdictions are strongly rooted into the rehabilitation doctrine: the blueprint of correctional policies is theoretically based on individualised approach, against the efficiency model promoted in the US.

In conclusion, I suggest that, for the reasons presented above, the European context must be considered an autonomous area of investigation within the discourse about computational models, AI and systems of criminal justice, especially because of the remarkable framework for the protection of fundamental rights, established in Europe in the second WW aftermath.

3.3 SPECIFIC IMPLICATIONS OF STARE DECISIS

However, within the European scenario itself, there are other specificities that may impinge on the reflection about if and how

Morgan, R. Reiner (eds.), *The Oxford Handbook of Criminology*, 5th ed., OUP, 2012, (955-985) p. 974.

⁶⁵ Wacquant Loic, *The great penal leap backward: Incarceration in America from Nixon to Clinton*, in J. Pratt, D. Brown, M. Brown, S. Hallsworth, W. Morrison (eds.), *The New Punitiveness. Trends, theories, perspectives*, Willan Publishing, Cullompton, 2005, p. 5 (3-26), reporting the US incarceration rate being, since the early 70s of the last Century, two or three times that of the major European countries.

⁶⁶ Quattrocolo Serena, Ruggeri Stefano (eds.), *Personal participation in criminal proceedings*, Springer 2019, p. 467.

computational models and AI should be used in criminal proceedings. An important distinction exists between common-law and civil-law jurisdictions, having important repercussion on the topic at stake.

As said, one of the most remarkable effects of the use of computational model in justice systems is the impact of predictability – praised by the many advocates of open data instruments, but also deeply coveted by lawyers – on the value of the precedent. Under this point of view, the English system traditionally relies on the principle of *stare decisis* which is mostly unfamiliar to the civil law tradition. Goodhart considered it “the distinctive feature of the common law system”, and, thus, the “fundamental distinction between the English and the Continental legal method”.⁶⁷ Despite the progressive realignment between the two legal families, over the years, having been theorised by the some of the most prominent comparativists,⁶⁸ this aspect still plays a remarkable distinction between the English jurisdictions and the continental ones.⁶⁹ Although there is no room for a more accurate reconstruction here, it is worth highlighting that the absence of *stare decisis* reflects a different structure of the higher Courts on the continent, which is inherent to the analysis that will follow. The number, the inner divisions, the functions of continental higher court is unavoidably intermingled with the value and the role of the precedent: the civil law ‘model’ implies a more diffuse authority of those organs and their decisions.⁷⁰ Moreover, the continental courts cannot rely on the writ of certiorari and have to hear – in a general sense - all the cases brought before them... and huge numbers mean less accessibility!⁷¹ The relevance of such remark is patent. Delving on the

⁶⁷ Goodhart Arthur L., *Precedent in English and Continental Law*, in *Law Quarterly Review*, 1934, 40-65, p. 42.

⁶⁸ Zweigert Konrad, Kötz Hein, *Einführung in die Rechtsvergleichung, auf dem Gebiete des Privatrechts*, I, JCB Mohr Verlag, Tübingen, 1971, p. 314 ff.

⁶⁹ See Cappelletti Mauro, *The Doctrine of Stare Decisis and the Civil Law: A Fundamental Difference – or no Difference at All?*, in H. Bernstein, U. Drobnig, H. Kötz, *Festschrift für Konrad Zweigert zum 70. Geburtstag*, JCB Mohr Verlag, Tübingen, 1981, p. 383.

⁷⁰ Cappelletti Mauro, *The Doctrine*, cit., 383.

⁷¹ Although not recent, an enlightening work is that collected in a special number of the *Revue internationale de droit comparé*, by Bellet Pierre, Tunc André, Touffait Adplphe, *La cour judiciaire suprême*, Economica, Paris, 1978.

value of predictability implies distinguishing between the common law system courts and the civil law ones. Also recruitment and conditions of independence of judiciary are crucial for this topic.⁷² The continental tradition of the bureaucratic state deeply influenced the structure of judiciary in the main European countries allowing for the Montesquieu's classical theory to flourish: judiciary still is, in many of those countries, an independent body of civil servants, recruited by public selection, who will progress in their career based on seniority, a feature that still marks a deep difference with the Anglo-American system, especially with regard to the highest courts.⁷³ The sketched background justifies the fact that the continental judge "develops skills in technical rather than in policy-oriented decision-making."⁷⁴ In such context, the civil law supreme court judges tend towards anonymity and their names do not emerge in bold relief.

However, it is worth highlighting that, comparing the European scenario with the US one, from the angle of the use of AI in criminal law, some further distinctions are due within the European area it-self. Some European jurisdiction provide for a jury trial, at least in some most serious cases, based on the traditional bifurcation between adjudication (fact finding) and ruling matters of law.⁷⁵ One of the latter is sentencing,

See, in particular, on this point, Tunc André, Conclusion: la cour supreme idéale, p. 441 ff.

⁷² See Zweigert Konrad, Kötz Hein, *Einführung in die Rechtsvergleichung*, cit., p. 139 (this part of the book is reproduced and translated into the English edition, by T. Weir, *An Introduction to Comparative Law*, OUP, 1998, p. 124 ff.); For a more recent overview on some of the most influential European jurisdictions, see, Delmas-Marty Mireille, Spencer John (eds.), *European Criminal Procedures*, Cambridge University Press, Cambridge 2002, 81 ff.

⁷³ Cappelletti Mauro, *The Doctrine*, cit., p. 387 and 393, where he affirms that the topic of confronting the two traditions needs to be approached under multi-fold aspects: "institutions and their organisations, bias and traditions, sociological backgrounds and attitudes of those who run the 'machinery'".

⁷⁴ See Cappelletti Mauro, cit., p. 387.

⁷⁵ See Langbein John H., *Bifurcation and the bench*, in P. Brand, J. Getzler, *Judges and Judging in the History of the Common Law and Civil Law*, Cambridge University Press, Cambridge, 2012. p. 67 ff. (See the interesting critical remark: "A judge who is kept away from fact-finding is so remote from the core function of adjudication that he is only peripherally responsible for the court's decision."

applying the just penalty to convicted. At the present time, the distinction between verdict and sentence is very clear in the Anglo-American criminal jurisdictions (see England for the most serious cases, before the Crown Court),⁷⁶ where the judge determines the sanction after the fact finding has been dealt with. However, this cannot be considered a distinguishing feature of the common-law, as some European continental countries, like France, provide for jury verdict, for serious cases, followed by judicial sentencing.

For the purposes of this study, the topic has a specific relevance. In fact, courts in sentencing, may rely on a different set of information, from the one used for fact-finding.⁷⁷ On the one hand, there may be insufficient factual evidence, if the trial concentrated on legal issues. On the other hand, there may be no trial and no formal evidence at all, as a consequence of a guilty plea. Determining the basis for sentencing is crucial and in some jurisdictions there may be exclusions, from the file, of information and materials that could be relevant in sentencing, but cannot be considered for the fact-finding decision-making process. This is the case of psychological assessment, that, in some jurisdictions, like Italy, for instance, is prohibited in fact-finding and allowed only at the correctional stage.⁷⁸

This could be an example of limitation in using tools predicting violent behaviour and recidivism. As said above, such software are rooted into a psycho-criminological theory, whose scientific reliability must be assessed in court. Nevertheless, no evaluation based on

⁷⁶ A full reconstruction of the English sentencing powers falls out of the scope here. Two aspects are worth highlighting, in these general remarks: on the one hand, the huge range of cases in which criminal sanctions are not applied by courts, rather by other public “agents who also have the role of keeping order, investigation, or preparing cases for prosecution”. On the other hand, having regard to formal sentencing, the “relentless frequency” of the sentence legislation over the recent years, beside the growth of guidelines, delivered today by the Sentencing Council, established by the Coroner and Justice Act 2009 (Ashworth Andrew, *Sentencing and Criminal Justice*, 6th ed., Cambridge University Press, Cambridge, 2015, p. 12 and 21).

⁷⁷ See Ashworth Andrew, *Sentencing*, cit., p. 424.

⁷⁸ Art. 220.2 of the Code of criminal procedure prevents expert witness on character (allowing it for psychiatrics) during the trial stage. It is allowed at the correctional stage.

psycho-criminological assessment would be admitted, e.g., in Italy, for fact finding and sentencing.

4. CONCLUSIONS

This general overview was aimed to focus the attention on the most relevant risks hidden in the ‘uncontrolled’ action of computational modelling and AI interaction on the criminal law realm, with regard to the civil law jurisdictions and, in particular, to Europe. As said, at the time being, the rush is not in giving answers but in starting posing the right questions. Why do we need computational modelling and AI in our court rooms? Can they improve the quality of criminal justice? Is this compliant with fundamental rights?

Answering these questions means urging criminal lawyers to focus their attention on an unknown realm, making an effort to understand risks and potentialities of the application of AI to criminal justice. It is undisputed that criminal law will not be excepted by the effects of the more sophisticated developments of the digital turn: like any other area of law, also criminal law must deal with it. The rights approach seems to me not that of rejecting it, but to understanding advantages, limits and risks of it. The European jurisdictions can rely on a strong net of fundamental rights and procedural guarantees, deriving from the ECHR, the EU law and the national constitutions. Based on this, European criminal lawyers can face the new challenges of the so-called fourth revolution with the hope of preventing the risk of serious violations of fundamental rights, such as the presumption of innocence, the fair trial, the right to private life and, maybe, of exploiting the benefits that the AI may bring to our backlogged justice systems.

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