

Artificial Intelligence and Democratic Rule of Law

Inteligência Artificial e Estado Democrático de Direito

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Abstract

This work aims to study fundamental legal theorizations linked to the Democratic Rule of Law in the scope of the intersection between Law and Artificial Intelligence. Results: i) Digital technologies mainly challenge the theoretical notions of territoriality and personality, fundamental to modern Law — and with that, theoretical notions about civil and criminal responsibility and fundamental freedoms should be reviewed in relation to the existence of autonomous non-human beings; ii) The Democratic Rule of Law, which is based, among other important notions, on legality and due process, will also have to be rethought in the context of the intersection of Law and Artificial Intelligence, since the decision-making processes carried out by autonomous systems have a nature that challenges traditional legal argumentative logic and transparency. Methodology: hypothetical-deductive method of procedure, with qualitative approach and bibliographic-documentary research technique.

Keywords: artificial intelligence; jurisprudence; democratic rule of law.

Resumo

Este trabalho objetiva estudar teorizações jurídicas fundamentais ligadas ao Estado Democrático de Direito no âmbito da intersecção entre Direito e Inteligência Artificial. Resultados: i) As tecnologias digitais desafiam, principalmente, as noções teóricas de territorialidade e personalidade, basilares para o Direito moderno — e com isso, noções teóricas acerca da responsabilidade (civil e criminal) e das liberdades fundamentais deverão

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ser revistas em relação à existência de entes autônomos não-humanos; ii) O Estado Democrático de Direito, embasado, dentre outras noções importantes, na legalidade e no devido processo legal, também terá de ser repensado no contexto da intersecção Direito/Inteligência Artificial, eis que os processos decisórios realizados por sistemas autônomos têm uma natureza que desafia a lógica argumentativa jurídica tradicional e a transparência. Metodologia: método de procedimento hipotético-dedutivo, com abordagem qualitativa e técnica de pesquisa bibliográfico-documental.

Palavras-chave: inteligência artificial; teoria do Direito; Estado Democrático de Direito.

Introduction

The difficult task of trying to keep up to date with the latest judicial decisions, statutes and regulations that come into force on a daily basis makes it almost humanly impossible to understand the universe of information that underlies the Law (Tacca and Rocha, 2018, p. 65-66). This work requires hours of research and the expenditure of substantial resources, costs which, in most cases, are charged to the clients of legal services. In this sense, the impact of AI on society, be it in terms of Law or Politics, will not change the reality in a single blow. Its application will trigger changes in the tasks and activities that people do — as many of them will be performed by intelligent systems; but perhaps AI will not be able to play many of them (including a significant number of tasks related to legal services). Many professionals will need to recycle themselves and find new areas of expertise in the legal field. The State, for its part, will have to reorganize itself for that disruption and try to find a balance. Education is at the same crossroads, since Law is, in the 21st century, still taught in a way that is just adapted to the needs of the 20th century (based on the accumulation of knowledge). In view of that, what should be introduced in the teaching of Law are abilities that machines do not learn well, as many routine legal tasks tend to disappear.

The latest developments in the evolution of AI technology suggest the need to reconsider the history of AI in Law. Despite the significant changes in the application of information technology to legal work, this has been mainly due to common information technology processes (processing, storage, retrieval and data management in combination with communication with rich, fast and global information through internet resources). However, so far, in the opportunities when information technology has been applied to deeper legal processes (which involve the very nature of Law), the result has not been very successful — a good example of this concerns to the application of IA systems to Law (Paiwala, 2016, p. 107). The scarce and unsatisfactory results of the expensive research in AI and Law have occurred due to a defective legal theory, which mainly is dependent of analytical positivism and ignorance of the user's needs and requirements. Many involved with AI and Law also refuse to acknowledge that there are underlying problems in the way they conceptualize the nature of legal reasoning.

Studying the theme of AI the implications of AI to Democratic Rule of Law, then, is of paramount importance for Law — mainly for Legal Sociology, Constitutional Law and Procedural Law. For Legal Sociology, understanding how a technical revolution that originates at the intersection of the systems of Economics and Science can cause important irritations in the programs of Law and Politics — changing the notions of time, space and personality, as well as the main democratic values inserted in the programs of such systems. For Constitutional Law, the importance of this type of study is mainly due to the impact that such transformations can bring to what is understood by the Democratic Rule of Law. And, for Procedural Law, it is due to the demanded renewal of the notions of decision, argumentation and jurisdiction that emerges within the use of AI in the Judiciary.

In this sense, the problem that led to this research can be described in the following question: what impacts can the use of AI bring to important legal theories, especially those related to the Democratic Rule of Law? As a hypothesis, it has to be said that several important points related to the Democratic State of Law will have to be conceived again in the reality of the use of AI in Law — mainly those related to due process, transparency and legality. Furthermore, the legal personality must be completely rethought as technologies related to AI are developed and applied to decision-making processes.

The main goal of this article is to study several fundamental legal theories in the scope of the intersection between Law and AI. To achieve that goal, the development of the article was divided into two sections, each of them corresponding to a specific goal. Then, the first one seeks to understand a possible future of Law due to the influence of digital technologies. The second, on the other hand, is dedicated to analyzing the impact of the use of AI in the decision-making and regulatory legal processes — analyzing, mainly, the respect for basic principles of the Democratic Rule of Law.

Methodologically, the nature of this research is exploratory. Regarding its method of procedure, it is hypothetical-deductive, with a qualitative approach and bibliographic-documentary research technique.

The future of law in the wake of digital technologies

The law/technology interface demands, from its observer, an averse posture to the search for technological essentialism, and should always stick to the social aspects of technology, as social relations suffer innovations along with technological innovations (Balkin, 2015, p. 59-60). The characteristics of a technology are totally dependent on the ways in which people use it in their lives and social relationships (Balkin, 2015, p. 45). Those uses evolve, and people continually find new ways to use it. When considering how a new technology affects Law, it is more pragmatic to understand what characteristics of social life such a technology makes stand out — that is, what opportunities and risks it can bring to human rights, freedoms and obligations.

Examples of the mistakes of essentialism can be seen in the cases of the internet and cell phones: the essence of the first, when it appeared, would be the simple exchange of visual and

textual information through computers connected to the telephone line; the second, would be making telephone calls. But the use of both was changing as the creativity of humans demanded adaptations and developments of such technologies, to the point that, today, it is possible to exchange much more than texts over the internet, and to do much more than talking on the phone with cell phones, in ways that would be unimaginable when thinking about a “essence” of a technology.

A new technology appears and inserts itself in a social world that was already in movement, with an existing set of expectations, norms and paradigms on the functioning of things and problem solving. Legally, these expectations, norms and paradigms can be called the *regulatory scenario* (Balkin, 2015, p. 50). This new technology disrupts the existing regulatory scenario, leading to a discussion about the possibilities of its use. As people claim this technology, however, they end up innovating (technologically, socially, economically, politically and legally), originating new issues for Law. Thus, instead of saying that Law responds to essential characteristics of a new technology, it is the social struggle for the use of innovations that is inserted in the preexisting characteristics of Law, thus interrupting expectations on how to (legally) qualify the facts related to them.

Not only history (past events and knowledge), but also the future possibilities of a Law and a technology must be considered when interpreting the interface between them. It is therefore necessary to consider the evolution of socio-technical-legal scenarios over time to properly decide to regulate technology in the present (Moses and Zalnierute, 2020). The elaboration of regulatory structures (through acts and technological design) should, therefore, reflect the need for adaptability in the future. Legal and technical solutions that solve the problems of the past or accompany the present can fall into obsolescence in the light of future legal, technological or social changes. Both technical design and legislation need to adjust over time in response to the rapid evolution of socio-technical-legal systems as a whole. In other words, although there is not necessarily symmetry between the problems in each area, both a technology and a legal form of regulation can fall into disuse. Thus, both the choice in the way the Law is formulated and the design choices approved will affect adaptability over time.

Law and technology are driven by human processes. Thus, both legislation and technological innovation are limited by human knowledge, based on past and present data (Moses and Zalnierute, 2020). The pace of legal change is more predictable, so that, while legislators very rarely predict technologies that do not yet exist, technological design can proactively anticipate legal change long before its implementation (which can take years after its implementation). Since humans only consciously influence the future, based on knowledge and action in the present, technology can be more easily designed to obliterate Law than the other way around. This explains why it is more common to complain about retrograde approaches to technology by Law. Therefore, just as the past and the present influence today's technical and legal agendas, so do beliefs about the future socio-technical-legal scenario. Ideas about tomorrow's technologies affect how acts, statutes and court decisions are made today. What is possible, what is necessary and what is actually done is influenced by the socio-

technical-legal scenario of the present, but this scenario is also projected with a view to the future.

What is seen today — machines beating humans in games like Go and chess, for example — is just the beginning of the AI revolution. Technology continues to improve exponentially: the speed, power and computing capacity of computers has doubled every two years, in the last half century, and the capacity for collecting, storing, processing and analyzing data continues to increase exponentially as well (the point that it has already been predicted that, in terms of calculations per second, computers will have the same capacity as a human brain in the next twenty years) (Alarie *et al.*, 2016, p. 424-425). One cannot forget the presence of strong skepticism about AI, too: there are those who believe that machines will never be able to perform the tasks that are currently performed by lawmakers, judges and lawyers. Since Law requires profound philosophical and moral reasoning skills (which machines will never replicate), skeptics believe that Law is a special branch of practice and knowledge. However, in the face of enormous technological disruption such as AI, the only thing that has not changed is the human capacity to underestimate the importance and impact of technological changes.

Computer science, robotics and AI have developed rapidly in recent years, with a potential to profoundly change all aspects of life in society. But the emergence and proliferation of those new technologies does not occur within the limits of traditional organizational, ethical and regulatory systems. Currently, humanity is going through an inflection point, from which new economic and normative models are needed to sustain these rapidly developing technologies (Pagallo *et al.*, 2018). The technological revolution will have a drastic effect on the modes of production of Law. The predictive power of how human beings behave evolves on an increasing scale, making it easier to obtain *ex ante* information. The dichotomy of rules and standards will disappear in a world with such vast information. Legal rules are simplistic and precise, but rarely ideal, since they are incapable of considering particular circumstances — being either too rigid, or too loose; they are vague, providing for onerous legal uncertainties and risk aversion (Casey and Niblett, 2016).

In a world with more information available, legislators will draft more complete and better normative texts, which Casey and Niblett (2016) call *micro-directives* — which are more specific and precise in relation to the circumstances of what currently occurs. This possibility of complete specification of the legal texts will represent a huge change in the balance of powers in the legal system, as they will not require the *ex post* adjudication of particular facts. Thus, as information becomes more available and inexpensive, litigation will thin out, with court decisions remaining only for cases involving truly new issues about Law or facts. And, with greater predictive power, regulators will be able to specify exactly the possibilities of licit or illicit behavior.

Advanced technology, added to the lower costs of information production, also has the potential to cause greater democratization of Law. By lowering the costs of producing information, it will be much cheaper for individuals and organizations to understand their rights and obligations. In the future, individuals may discover their legal status exactly and obtain relevant information immediately, because in addition to the continuity of the fall of

the cost of information production, communication costs will also decrease dramatically (Alarie *et al.*, 2016, p. 426). The transition from an analog world with slow and expensive communication to a digitally connected world with real time and communication at almost no cost can bring significant advantages (Alarie, 2016): in the long term, the advent of the *legal singularity* — a situation in which standards are stable, complete, non-conflicting, and provide practical guidance in themselves.

Due to this situation of legal singularity, with very low information and communication costs and virtually unrelenting digital connectivity, the legal services sector could be transformed by the automation of many tasks that, until recently, were performed exclusively by humans (Alarie *et al.*, 2016, p. 427). Law firms will be able to use precise software for document analysis (reducing time and cost of tasks), precise and specialized electronic legal research tools (making such a task faster and cheaper), machine learning and Big Data analysis technologies to predict Court decisions for specific cases (analyzing not only how the facts of a case fit the legal landscape, but also how individual judges have ruled similar cases in the past and the evolution of legal doctrine), and AI systems to negotiate with customers and write documents (contracts, statements, petitions, etc.). Therefore, perhaps technology will increase, instead of replacing, the number of lawyers — who will need to adapt to the automation of specific tasks (Yoon, 2016). The effect of increased technology will be a net positive factor for the legal services industry, as innovative Law firms will be able to provide cheaper, faster and more accurate legal advice.

The great availability of data raises other transformative issues for Law — and here it is worth highlighting issues related to Law and territorialization. Data, closely linked to the algorithms that support them, form the “datasphere”, a kind of reflection of the physical world in which traces of the activity that occur in the physical world are detected (i.e. someone’s position at a given moment, commercial operations, environmental conditions of certain spaces, financial transactions, road traffic, etc.) (Bergé and Grumbach, 2017, p. VI). Previously nonexistent activities emerge from this digital sphere, such as search engines to access knowledge — but it is also possible that activities that have always been guaranteed in the physical world become transferred to the digital sphere, such as connecting drivers with passengers. Those data can be open (quite accessible) or closed (accessible, but with strict access restrictions); they can be static (at rest), or dynamic (in motion). Data are generated from the activity of human beings or equipment (such as sensors), flow to the data storage centers and return to individuals after their transformation.

Datasphere challenges Law in the way it understands spaces in the broadest sense of the term. The solution must be sought mainly in the constructions of Public International Law — with its regime of spaces in which lands, waters, airspace and outer space are approached more broadly (Bergé and Grumbach, 2017, p. VII). But legal constructions do not yet recognize data sphere as a new space, unlike what happens to other spheres. In other words, datasphere is still not considered to be the creator of a specific field of human activity in which Law may intervene and organize.

Two new types of legal relationships are formed with the appearance of this new space (Bergé and Grumbach, 2017, p. IX):

i) new relations regarding conventional institutional territories (i.e. States, international and regional organizations): facts are apprehended by data that are collected, processed and moved in a dematerialized way, detached from conventional territories, thus generating independent and intangible values in relation to the physical resource itself. When moving in their own sphere, data starts to relate differently to traditional institutional territories;

ii) creation of new territories: the way in which Law deals with new territories in other existing spheres (hydrosphere, biosphere, etc.) illustrates the jurist's ability to revisit his/her areas of study as human savoir-faire evolves. Several paths are explorable to legally define the spaces within the datasphere. One of them would be to divide the data between those which are close to conventional institutional territories and their access rules, those not indexed in search engines (such as those available on the deep web) and those available only through specific software, such as TOR and Bitcoin.

Technological evolution can also change the way the essential foundations of legality are conceived. In other words, the powers of emerging technologies in the legal sphere can lead individuals to review what they understand by "Law" (Sheppard, 2018, p. 62). The promise of social control by machine learning systems will be dampened by increasing concerns about its inscrutability. And legality may come to depend on individual dispositions to accept an intimate relationship with the legal system, or to accept broad collective objectives (even if the norms and orders in the service of those objectives become narrower and less intuitive), or even, in accepting a growing disconnection between the way individuals decide and the way the system does it.

The content of the essential bases may depend on individual provisions in replacing the intelligibility of rules and processes (knowing how legal issues are being resolved for resolving disputes) and results (knowing that legal issues are being resolved quickly) (Sheppard, 2018, p. 33). Those compensations can lead to the rejection of conceptions of Law that require competent employees, tests of legitimacy based on rationality or deep justifications for coercion. Thus, there may be a great risk of substituting the guarantees of due process and legality for the simple efficient result, since machine learning techniques operating based on the Big Data formed in the datasphere, with their own and inscrutable logic, would allow it.

When it is considered essential to maintain access to justice and promote the rule of law, ordinary citizens should be allowed to effectively use the powers granted to them by the legal system in the face of State powers. In relation to those objectives, conventional uses of legal technology as a substitute for existing legal services today are likely to be ineffective, as the economically and politically powerful actors are likely to be in a better position to take advantage of technological savings in such services.

The efforts of legal-technological innovation, therefore, must be undertaken towards transformative technologies. Legal AI, for example, can facilitate the collective action of the less fortunate people, by automating the mass identification of legal issues and the collective exercise of legal options. It can also facilitate the preventive approach on the social causes of legal problems, allowing the fight for justice not to be reduced to the adversarial conflict between unequal and individualized parties. Thus, instead of building innovations that make single combat cheaper, innovations that allow low-income groups to initiate different types of litigation should be developed (Gowder, 2018, p. 105).

On the one hand, the limits of legal automation do not depend on the semantic irreducibility of human decisions in automated results, as the delegation of decisions to automated systems, as such, does not affect the relevant standards of conduct that legal rationality takes into account. In fact, automation can perfectly fit the conditions of existence and normal functioning of rules, values and principles that substantiate the normative context, when it comes to simple cases (easy cases), mainly. However, hard cases should not be entrusted to automated processes (even if this will become technically feasible one day), as they require human understanding, interpretation, meditation, criticism and a prudent assessment of the system's principles and rules. Furthermore, those human mental processes must be available in a framework for public discussion and deliberation on the values and principles that structure the normative context of the law (Pagallo and Durante, 2016, p. 333-334). This, of course, if what is desired is the continuity of what is meant by the Democratic State of Law, with its values and foundations already well known.

The theory of legal personality should also undergo changes, due to current and future technological transformations — mainly with regard to robots and AI entities. Perhaps a third gender of personality should be created, in addition to the natural person and the juridical person; perhaps, due to man's fear of losing control of technology, this is out of the question. However, the needs related to (civil and criminal) responsibility for illegal acts demand, from now on, the (academic and political) debate on the topic: the autonomy of AI and robots causes the need for this questioning, because such a requirement, at least for modern Western Law, defined, among other elements, the person's own conditions from the point of view of Law.

Fundamental rights issues pertaining to the personality/capacity of entities derived from technological developments (AI entities, robots, etc.) can also arise — because people tend to be holders of obligations and rights, including fundamental ones (Krausová, 2017, p. 60). Should AI entities have the original content produced by them (artistic, intellectual, literary works, etc.) protected by intellectual property? It may seem like a question made too early, but there are already records of musical works, cinema and drama scripts, short stories and poems produced with the use of AI (Merchant, 2015; Goldhill, 2016; Newitz, 2016). Perhaps they are not yet appreciable for the refined human taste, but they certainly already denote the beginning of a new form of expression and the consequent need for revision of the theories concerning the right to intellectual property.

There are at least two major problems that AI poses for Law (Balkin, 2015, p. 46): *i) distribution of human rights and responsibilities that arise from non-human actions (as AI*

entities will be used both to create new things as well as to violate the legally protected interests of others): since humanity is still a long way from treating robots and AI as self-conscious entities of rights or responsibility, the key question for Law is how to allocate rights and duties among human beings when AI creates benefits or torts; ii) *substitution effect (substitution of human beings by AI agents)*: which extends far beyond the exchange of human workers for machines. It is also about the fact that AI entities have social meaning for people (in a kind of anthropomorphism and/or zoomorphism). With this, humans project emotions, feelings, pleasure and pain, the ability to form relationships, to care for others and to be cared by them. And this projection about what is not human is the reflection of the self in the outside world (Balkin, 2015, p. 56).

The problem with substitution is that, through their interactions with AI entities, people are willing to replace them with human beings in certain contexts and for certain purposes. People treat AI agents as people for special purposes — which can bring about a new category of legal subject, a middle ground between person and object (Calo, 2015, p. 549). It would be middle ground because the assignment of status can be incomplete, contextual, unstable and, above all, opportunistic, making people treat AI as a person for some purposes, and as an object, for others (Balkin, 2015, p. 57).

Furthermore, the unpredictability of the ways through which AI will interact with the environment and people will create problems for Law. And this unpredictability is directly associated with the complexity of the algorithms — not only in relation to their programming language, but also, to the fact that they learn, self-program and, therefore, seem to have a certain “autonomy”, due to their lack of explainability and, because of it, of transparency (once programmed, these algorithmic machines start to establish their own logic, which escapes even the understanding of their original programmer).

The freedom of expression of such artificial entities must also be analyzed because, on the one hand, their manifestations can cause damage to the honor, image and patrimony of others; on the other, if the expression of AI does not receive any form of legal protection, the public may be deprived of valuable information (Krausová, 2017, p. 60). And as freedom of expression results from the freedoms of thought and belief, one should also analyze such philosophical-religious freedoms of AI, as it will learn from its interactions with human beings — and, to accommodate some users, it can begin to show signs of belief (or at least respect for some belief). If religious belief continues to be a value that is politically protected by society, debates about it should occur.

AI is being integrated into systems that influence decisions, analyzing complex situations and driving processes — which can bring risks to humans. At the same time, AI is not yet complex enough to be able to feel or suffer (and perhaps it will never be). In this sense, it is necessary to discuss the extent to which society is willing to integrate future AI systems in important social processes (Court decisions, drafting of legal norms and teaching, for example). This demands to discuss whether AI systems can be ethical agents. In addition, it presents options for liability for damages caused by the activity of AI systems (Koo, 2018, p. 28).

AI and autonomous robots will be part of the future society. And there will also be the integration of AI within the human body. Human physical and informational integrity will be invaded, with or without knowledge/consent. A substantial portion of personal data is already being shared with third parties, and this does not seem to concern most people as much — and the degree of sharing has been forced further, in various ways, by governments and industry, to regulate/protect the system and to reduce risks and costs of services and products (Van Genderen, 2018, p. 51). Robots acquire more and more knowledge or skills from their own interaction with living beings that inhabit the surrounding environment, so that more complex cognitive structures emerge in the state transition system of the artificial agent system (Pagallo, 2019, p. 35). If on the one hand robots and AI beings will behave in very different ways, according to the way humans train, treat or manage them, on the other hand, the behavior and decisions of those artificial agents can be unpredictable and risky, affecting traditional principles of Law, such as a “reasonable expectation” of privacy.

It is, then, essential that human beings maintain control of the system, to avoid confrontation with autonomous systems, which use the collection of all types of personal information and other data available for their own purposes. But the development of automaton technologies can only occur without frightening effects if the entities that result from it are commercially admitted into the consumer’s daily life without many legal restrictions (Van Genderen, 2018, p. 52).

The intersection between legal knowledge and AI: consequences for the Democratic Rule of Law

While there is still no significant operational success for AI in legal systems, it is quite possible that, as such technology becomes more sophisticated, broader avenues for AI in legal systems will be opened. Currently, machine learning (one of the most promising facets offered by AI technology), which has been very successful in games of Go and chess, develops knowledge through trial and error processes, testing millions of movements. Perhaps in the future, the investment required to replicate the millions of learning processes will become trivial, thus providing the potential for a legal AI system. If this happens, the problem of legal theory with AI will come to the fore in a very expressive way (Paiwala, 2016, p. 112). The developers of most legal AI systems try to start with a description of the world of Law, but tend to do so with a flawed jurisprudence, when what is needed is a complex structure of Law. Without adequate knowledge of the key issues, it is possible that these systems replicate past failures or result in systems that, while technically successful, produce results that are not adequate from the point of view of legal needs (in the sense of guaranteeing people’s rights, enforce obligations, and also theoretical coherence in order to obtain fair decisions for people).

Even an AI system that learns from millions of trials and errors will have its own problems, as trial and error systems learn from their own iterations, in an opaque learning process that therefore is difficult for those concerned with political issues related to Law. And

if legal decisions are provided by an opaque black box, which does not reveal the ways through which it decides, this can transform the relationship between Law, lawyers and society. Proper development of legal AI requires greater awareness of user needs, and a broader social and ethical context than just sophisticated rules-handling skills (Paiwala, 2016, p. 113).

In addition, there must be acceptance of the principle that, for a socially constructed universe, in which the Law is found, it must be understood that the question “what is the Law” must involve the ways in which it is discovered. In other words, there is no such thing as a pure ontology — which means that broader issues of a complex law/society interactive context need to be explored.

And forcing crude AI systems into society can lead to results that do not promote social justice and human rights. In other words, it is not enough just to have economically efficient systems with regard to material, human and chronological resources for judging disputes (which is what current technological development tends to offer): it is necessary to observe the need to promote certain purposes with the Law — which, besides the facet of the administration of the litigations through the jurisdiction, has the political facet of building a more democratic society in less unfair.

Therefore, the use of algorithms that replace humans in legal decision-making processes requires a discussion of the need for transparency in such processes performed by algorithms. This is because the transparency of decisions (that is, the ways judges decide must be public and understandable) is directly linked to maintaining the guarantee of due process users’ liability (Pagallo, 2018a/b).

Certainly, the legal challenges of the algorithmic society cover other issues, such as the protection of personal data collected and privacy of information — which is directly related to issues of reputation and discrimination, manipulation and disrespect to due process as well. But even if long and articulate texts (such as that of the General Data Protection Regime of the European Union) constitute supposedly complete normative bases for the correct use of algorithms, a new set of difficult cases is bound to remain open in the legal field. Such cases concern the interpretation of those texts, which does not depend only on the terms that fit the legal issue, statistical purposes of data processing or on how these terms are related in legal reasoning — therefore, one must question whether the right to having an explainable Law is valid in such regimes.

Attempts to balance automated and non-automated processes can result in ways of implementing and applying algorithms that do not affect the conditions of existence and normal functioning of the rules, values and principles that substantiate the normative context of Law. In other words, an understanding that the use of algorithms in Law does not depend only on mathematical logic must be disseminated, since the challenges that automation brings to Law have much more to do with the role that social acceptance and cohesion play in these cases.

AI and Law intersect at various levels. AI influences legal practice — making lawyers, judges and employees more efficient in their work (and automating some legal services) —

but it also influences Law theoretically. AI challenges traditional legal concepts, demanding severe adaptations from Law, which should occur as new developments in AI arise. On the other hand, Law will shape, through regulation, public policies and judgments, the development of AI and the creation of new standards, guidelines and limitations in various domains of AI applications (Krausová, 2017, p. 61). Extensive legal research will need to be carried out to determine the social implications of implementing AI and robots in everyday life. Significant examples of this can be found in the eventual need for differentiated regulation for AI, as well as in the implementation of public policies on the application of AI (so that this does not mean massive human unemployment), and in the eventual need for development of differentiated ways of resolving disputes concerning the application of AI in the social world.

To postulate a flexible ethics, devoid of practicable legal concepts about responsibility (of creators, suppliers and users) and the acceptable limits of the integration of AI systems in the State and in society can be socially dangerous. The lack of analysis of the ethical and legal implications of the use of AI can open the door to systemic misuse of AI for Human Rights violations, as such violations can always be declared under separate ethics of the machine system. If AI remains an instrument or tool, without being considered an ethics agent, the responsibility for damages for its use will remain with human beings. This is necessary because, at least so far, there is no social concept for dealing with autonomous actions of machines, regardless of human responsibility (such as Asimov's "robot rules" or similar). But the closer the strong AI is (as conscious as the human or more), the more the acceptance of AI as an autonomous moral agent would require a socially accepted system of ground rules for its performance. The solution for the use of weak AI in the recent reality is, therefore, in the intelligent use of civil liability rules (Koos, 2018, p. 28-29).

Invaluable contributions have provided computer science with formal methods based on mathematical logic to define highly complex algorithms practicable by software. AI, based on such contributions, has at its core logical-mathematical theories that allow the creation of automatic systems capable of considering vast ranges and combinations of information that can be impractical for any human being. So much so that AI is currently used to make decisions adapted to the individual preferences of software users who suggest where to pass holidays, how to find a partner, which movies to watch, etc. Various fields of knowledge, such as finance, medicine, industry, geology, astronomy, aviation and music are affected by the development of such technology. Virtually every professional discipline continually evolves its praxis through the use of computers — all, except Law (Moguillansky, 2018a).

In most cases, legal practice is still nurtured by AI's contributions to a remarkably discreet use, such as processing texts more effectively. It is clear that there are advances resulting from computing in the Law, and that such advances are not negligible (word processing remarkably energized legal praxis, either by the ease of editing and multiplying the work, or by the frequent temptation to copy and paste texts), favoring the deepening of the process to the detriment of the attention to the conflict, and contradicting the idea of reducing the bureaucracy of justice. But when one considers the positive aspect of such contributions, it

is important to remember that, from the point of view of advances in computing, word processors are here for more than thirty years.

If legal argumentation is considered only from the pure perspective of logic, it can be considered superfluous, intuitive and illusory (Moguillansky, 2018b). It causes the definition of informal reasoning methodologies that, at times, become very well-known in the scope of their practice, but little disseminated at a logical-formal level in the field of science. A logical formalization would open space for the critical analysis of other views and would eventually lead to an inevitable evolution of the techniques underlying legal reasoning. In addition, it would facilitate the emergence of software that supports legal arguments through recommendations (in the evaluation and construction of evidence, for example). But as long as formal logical work has little space in legal practice, those methodologies will continue to be completely unknown to the scientist who is unaware of this practice.

Therefore, recommendation systems for the solution of disputes issue justified suggestions in the sources of the Law (including precedents), but it is the human judge who must give the final answer to their criteria. A recommendation system would be of great help in estimating the sufficiency of evidence, and in measuring the discretionary exercise of the judge and proposing margins to define it, so that the interpretations of the case can vary “rationally”. Technological assistance would, thus, raise the standard of reasoning in terms of formality and material correction. But disputes need a human solution (Moguillansky, 2018b). Conflicts crossed by mathematical logic may allow a theoretical analysis of their formal construction, but human subjectivities can only be resolved through the consideration of other humans.

Even if the new AI get some successful legal applications, the core of the relationship between AI and Law — namely, that of assisting legal decision-making — is likely to remain resistant to the progress of this AI whose algorithms learn through the analysis of Big Data. This is because the nature of legal data, subject to controversial interpretations, changes and reinterpretations, is so different from data in other fields (such as chess and Go) that one should not generalize too quickly the success in other areas to the legal field. Law is a social construction; its rules and principles are dependent on acceptance and socio-cultural creation, and not a natural phenomenon, resulting from logical-mathematical principles (Bench-Capon, 2020, p. 32).

AI must be considered as a tool, as an extension of human intelligence — and not as an externalized threat to be feared as presented in popular culture. And clearly the strategic uses for which it is placed that determine its value. The possible abuses of AI are manageable risks, and should not irrationally restrict its development when the potential benefits outweigh the damage (Tuffley, 2019, p. 184). In this sense, a possible interpretation of the rhetoric of Hawking, Gates and Musk — for whom AI research and development is equivalent to “summoning the devil” (McFarland, 2014) — is that these are attempts to cause fear among the public and in doing so, pressure governments to legislate on stricter controls over the future of AI development.

A prosperous future with a better quality of life depends on accepting the challenges of AI — and paying attention to the dynamic tension generated when transitioning from a human to a “post-human” society is particularly important. Extinction events (seismic catastrophes, asteroid impacts, or global contagion, etc.) are contingencies that really haunt humanity, and technology (especially AI) represents humanity’s best chance of survival.

Knowing the strengths and limits of current AI technology is crucial to understanding AI within the legally correct limits. And a realistic and demystified view of the intersection between AI and Law must begin with the awareness that such technology is not intelligent in the human cognitive sense of the word, but capable of producing intelligent results without intelligence, taking advantage of standards, rules and heuristic models that allow users to make useful decisions in certain contexts (Surden, 2019, p. 1337). However, the current AI is quite limited, as it is not very efficient in dealing with abstractions, understanding meanings, transferring knowledge from one activity to another and dealing with completely unstructured or open tasks. This situation illustrates well the fact that most of the tasks in which AI has proved successful (playing chess and Go, discovering credit card fraud, tumor detection, etc.) involve highly structured areas, in which there are clear right or wrong answers, and strong underlying patterns that can be detected algorithmically.

An artificially intelligent legal system is defined as one with three functional capabilities: i) generating legal norms; ii) applying the legal norms it generates; iii) using in-depth learning to modify the legal norms it generates (Solum, 2019, p. 53). The key to assessing a supposedly artificially intelligent Law is to focus on the functional capabilities of the system compared to comparable human systems, such as regulatory agencies.

Specialized legal AI systems for certain tasks already exist and have been used to make legal decisions for some time (for calculating court fees, drafting agreements and searching for precedents applicable to a case, for example). Although such systems are very useful and effective for certain complicated and detailed tasks, they have no legal authority — that is, the results of their operations are not legally binding. Those specialized legal systems do not have the necessary capabilities for a true artificially intelligent Law, as they are algorithmic: they operate based on formulas, accepting the input of data by the human user of the system to produce outputs specified by numerical formulas (Solum, 2019, p. 55). It is clear that this situation would change with the incorporation of this type of system to the legal norms through acts of the Legislative that made the use of these systems mandatory.

There is no artificially intelligent system with the desirable functional capacities currently, let alone those required by climate policy, the regulation of prison issues, or the needs that the fight against terrorism presents, for example (Solum, 2019, p. 62). Thus, it appears that an artificially intelligent Law has not yet strayed from the domain of science fiction, but the current state of AI research in this sense is suggestive. Especially important here is the idea of “deep learning”, whereby machine learning programs are self-modifying, improving themselves through the use of neural network architecture to implement machine learning.

Hildebrandt (2018) criticizes more optimistic theoretical possibilities about the application of AI in Law — especially those that seek a “complete Law”, without gaps, that illustrate a “legal singularity”, without uncertainties. In her view, such a Law would be a totalitarian system, since it would be endowed with a supposedly complete prediction of human behavior, and in which the “regulation by design” of that behavior would occur in a total way — that would be a kind of discipline or Public Administration, not a Law itself. A possible way to avoid the realization of this scenario would be the adoption of AI systems by lawyers, in order to seek their alignment with the Rule of Law in a stable and contestable way. This can save humanity from ridiculously complex systems that outperform large corporate compliance issues.

Submitting legal AI under the rule of law is not something obvious, as it requires a specific design of the future computational architecture of legal systems — that is, it demands the reinvention of the rule of law itself, establishing and developing standards appropriate to this technological scenario, translating fundamental legal principles into hardware, software and machine learning methodologies.

Legal protection by design of AI tools means safeguarding individual capabilities to challenge automated decision systems, providing time and space to challenge the functioning of such systems. But the realization of this possibility is challenged, mainly, because of the following reasons: i) the opacity of machine learning systems can make decisions based on their results inscrutable (and, therefore, indisputable); ii) the change from significant information to computation implies severe changes — from reason to statistics, and from argumentation to simulation; iii) in the development of data-based legal intelligence, fundamental rights can be compromised or even violated — mainly privacy, non-discrimination, presumption of innocence and due process, consumer protection, worker protection and competition law; iv) as algorithms become highly accurate due to training, lawyers can outsource part of their work.

Once automated inference is valued for what it really is (and not what it is supposed to be), the space for building trusted AI applications can be expanded. The Herculean challenges resulting from climate change and the reconfiguration of labor markets due to migration, for example, may require the extensive use of reliable AI. But reliable AI can only be developed if it is based on solid and contestable research projects, anchored in the fundamental principles of reproducible open science (Hildebrandt, 2020, p. 78-79) — and not in central principles of seductive marketing strategies grounded on manipulative assumptions of nudging.

Conclusion

The observation of the Law/technology interface must start from a search for the social meaning of a technology, and not for its “essence” (which is misleading, since the technology itself changes as its meanings change, in the wake of the evolution of social relations). And along this path, the likely effects of substitution and unpredictability on AI systems create issues for the Law: due to the substitution effect, people tend to treat such devices as people,

but in an opportunistic and contextual way (at some moment, AI it may come to be considered as a “person”, in others, as an object, depending on the interests projected in them by the user); and due to the unpredictability, due to the inherent complexity of AI (which, in addition to functioning according to a syntactically and semantically complicated programming code, learns for itself, running away from human understanding due to the opacity of its own logic), social expectations (normative and cognitive ones) which are paradigmatic of the social moment in which the technology is inserted are disappointed, demanding adaptations in the program already existing in Law, or entirely new legal-theoretical creations to encompass such innovation.

In addition to the current social context and all historical knowledge, whoever wants to understand the regulation of technology by the legal system must understand the values, beliefs and social, technical and legal aspirations (in other words, expectations) that are projected in the future technological development, because just as technology causes irritation to Law, the reverse also occurs: the possibilities programmed in Law condition, in a certain way, innovation.

The ways through which Law considers space and territoriality should be reviewed, creating new normative theories for those important notions, due to the large datasphere that has been created as a reflection of human behavior in the physical world. Just as the various spheres of the physical environment (hydrosphere, atmosphere, biosphere, etc.) have been altering the programs of Law in recent times due to social complexification, this datasphere will require different regulation. In this sense, perhaps the accessibility degree and the indexation of data in search engines will constitute an initial outline of theoretical differentiation within this large sphere of data.

Furthermore, the great efficiency that can be provided, in the solution of disputes, by machine learning technologies and analysis of large volumes of data generated by human behavior stored in the datasphere, can lead to change about legality and due process guarantees — meaning that formal legality (that is, the cognition of the bases on which legal decisions are made) could be, in future, exchanged by the efficient result (quick decisions). In order to maintain access to justice and promote Democratic Rule of Law, technological innovation in standardization and conflict resolution must value not only cost reduction in the provision of individual legal services. Rather, care should be taken to seek collective legal solutions to social problems — otherwise, those who have the resources to access individual technologies will remain in a situation of hypersufficiency in relation to the large mass of destitute individuals.

The integration of autonomous entities, resulting from technological development, will require a revision of the theory of legal personality. It may be necessary to create a third genre, in addition to the natural person and the legal person, especially when technology reaches a degree of evolution in which such entities can have an autonomy and awareness comparable to that of a absolutely capable human from the legal point of view (mainly due to the needs of civil and criminal liability) — but this is a debate that must already occur, since the degree of integration between man and machine, in the most varied ways, only tends to increase. Regulation and elaboration of public policies related to the development, use and

legal consideration of AI entities emanate many theoretical-legal and political issues that should be debated as technological development occurs. Freedoms, rights, obligations and responsibilities related to the expression of AI demand deep theoretical debates about this.

In addition to the technical problems that AI technologies have to develop, the main legal problems regarding the AI/Law relationship concern, mainly, to jurisprudence. This means that it is not enough to conceive the Law system as a mere structure of rules, with well-defined syntactic and semantic relations: there are pragmatic ends that the jurisdiction must observe — ends that are political, concerning the Democratic Rule of Law, Human and Fundamental Rights and social justice. It is clear that such democratic ends are not necessary for the pure and simple functioning of the system of Law: mechanically, it is enough to apply rules to specific cases. But a legal system that is understood as democratic and fair needs to go beyond the mere application of rules, because, politically, behind these rules, there are ethical and political foundations to be realized through the administration of justice — and it is precisely these foundations that jurisprudence about AI must seek to develop, beyond the mere efficiency that technology seems to offer. In addition, continuing the legal-democratic culture in times of AI means ensuring transparency in decisions, as AI systems end up developing their own logics, which are beyond the domain of their programmers. They operate by mathematical logic, statistics and by pure framing facts to norms, which is incomplete for the needs of democratic Law.

Legal use of AI cannot be disregarded: it involves a wide technological scope, and its solutions can help better decision-making related to Law and litigation. But the fear that Law will be learned as easily by machines as other forms of knowledge (such as playing chess) must be dismissed by the consideration that legal knowledge does not derive from logical-mathematical rules, but rather, socio-cultural and from human coexistence, much more complex than calculations.

In this sense, judicial decision cannot be simply relegated to mathematical logic. Such logic can assist in the decision (on the sufficiency of evidence in a process, mitigating the degree of discretion in the decisions and/or building a coherent research of precedents), but people and litigations related to their social relations have subjectivities that can be captured only by sensitivity and the experiences of human peers (who also have them). Therefore, perhaps the most appropriate way of using such devices by the Public Administration, the Judiciary and the Advocacy in general is the combination of logical-mathematical procedures and non-automated procedures — and this should be included in the basic normative instruments of the application of AI as auxiliary legal tool in decisions.

References

- ALARIE, B.; NIBLETT, A.; YOON, A. H. 2016. Law in the Future. *The University of Toronto Law Journal*, **66**(4):423-428. DOI: <https://doi.org/10.3138/UTLJ.4005>.
- ALARIE, B. 2016. The path of the law: Towards legal singularity. *The University of Toronto Law Journal*, **66**(4):443-455. DOI: <https://doi.org/10.3138/UTLJ.4008>.

- BALKIN, J. M. 2015. The Path of Robotics Law. *California Law Review*, **6**:45-60. Available at: http://www.californialawreview.org/path_robotics_law/. Accessed in: 10/05/2020.
- BENCH-CAPON, T. 2020. The Need for Good Old-Fashioned AI and Law. In: F. Kummer *et al.* (eds.), *International Trends in Legal Informatics: Festschrift for Erich Schweighofer*. Bern, Editions Weblaw, p. 23-36.
- BERGÉ, J.-S.; GRUMBACH, S. 2017. The Datasphere and the Law: New Space, New Territories. *Revista Brasileira de Políticas Públicas*, **7**(3):II-XVII. DOI: <https://doi.org/10.5102/rbpp.v7i3.5075>.
- CALO, R. 2015. Robotics and the Lessons of Cyberlaw, *California Law Review*, **103**:513-564. Available at: http://www.californialawreview.org/print/2robotics_cyberlaw/. Accessed in: 10/05/2020.
- CASEY, A. J.; NIBLETT, A. 2016. Self-driving laws. *The University of Toronto Law Journal*, **66**(4):429-442. DOI: <https://doi.org/10.3138/utlj.4006>.
- GOLDHILL, O. 2016. The first pop song ever written by artificial intelligence is pretty good, actually. *Quartz*, September 24. Available at: <https://qz.com/790523/daddys-car-the-first-song-ever-written-by-artificial-intelligence-is-actually-pretty-good/>. Accessed in: 10/05/2020.
- GOWDER, P. 2018. Transformative legal technology and the rule of law. *The University of Toronto Law Journal*, **68**(1):82-105. DOI: <https://doi.org/10.3138/utlj.2017-0047>.
- HILDEBRANDT, M. 2018. Law as computation in the era of artificial legal intelligence: speaking Law to the power of statistics. *The University of Toronto Law Journal*, **68**(1):12-35. DOI: <https://doi.org/10.3138/utlj.2017-0044>.
- HILDEBRANDT, M. 2020. The Artificial Intelligence of European Union Law. *German Law Journal*, **21**(1):74-79. DOI: <https://doi.org/10.1017/glj.2019.99>.
- KOOS, S. 2018. Artificial Intelligence: Science Fiction and Legal Reality. *Malaysian Journal of Syariah and Law*, **8**(2)23-29. Available at: <http://mjsl.usim.edu.my/index.php/jurnalmjsl/article/view/135>. Accessed in: 10/05/2020.
- KRAUSOVÁ, A. 2017. Intersections between Law and Artificial Intelligence. *International Journal of Computer*, **27**(1):55-68. Available at: <https://www.semanticscholar.org/paper/Intersections-Between-Law-and-Artificial-Krausová/b4bd16cb0221a74b4aef6e263c0339948edc75d6>. Accessed in: 10/05/2020.
- MCFARLAND, M. 2014. Elon Musk: 'With artificial intelligence we are summoning the demon.' *The Washington Post*, October 24. Available at: <https://www.washingtonpost.com/news/innovations/wp/2014/10/24/elon-musk-with-artificial-intelligence-we-are-summoning-the-demon/>. Accessed in: 10/05/2020.
- MERCHANT, B. 2015. O poema que passou no teste de Turing. Translated to Portuguese by Ananda Pieratti. *Vice*, February 06. Available at: https://www.vice.com/pt_br/article/53y7wd/o-poema-que-passou-no-teste-de-turing. Accessed in: 10/05/2020.
- MOGUILLANSKY, M. 2018a. O. Inteligencia Artificial y Derecho – Realidades y Ficciones (Parte II). *Diario Penal*, **178**. Available at: <https://ri.conicet.gov.ar/handle/11336/62900>. Accessed in: 10/05/2020.
- MOGUILLANSKY, M. O. 2018b. Inteligência Artificial y Derecho – Realidades y Ficciones (Parte II). *Diario Penal*, **179**. Available at: <https://ri.conicet.gov.ar/handle/11336/62899>. Accessed in: 10/05/2020.
- MOSES, L. B.; GOLLAN, N. 2016. The Illusion of Newness: The Importance of History in Understanding the Law-Technology Interface. In: A. George (ed.). *Flashpoints: Changing*

- Paradigms in Intellectual Property and Technology Law. New Orleans, Quid Pro. DOI: <http://dx.doi.org/10.2139/ssrn.2697311>.
- MOSES, L. B.; ZALNIERUTE, M. 2020. Law and Technology in the Dimension of Time. In: S. Ranchordas; Y. Roznai (eds.). *Time, Law and Change: An Interdisciplinary Study*. Oxford; New York, Hart Publishing, p. 303-326. Available at: <https://ssrn.com/abstract=3461408>. Accessed in: 10/05/2020.
- NEWITZ, A. 2016. Movie written by algorithm turns out to be hilarious and intense. *Ars Technica*, September 06. Available at: <https://arstechnica.com/gaming/2016/06/an-ai-wrote-this-movie-and-its-strangely-moving/>. Accessed in: 10/05/2020.
- PAGALLO, U.; CORRALES, M.; FENWICK, M.; FORGÓ, N. 2018. The Rise of Robotics & AI: Technological Advances & Normative Dilemmas In: CORRALES, M.; FENWICK, M.; FORGÓ, N. (eds.). *Robotics, AI and the Future of Law*. Singapore: Springer, p. 1-14.
- PAGALLO, U. 2018a. Algo-Rhythms and the Beat of the Legal Drum. *Philosophy & Technology*, **31**(4):507-524. DOI: <https://doi.org/10.1007/s13347-017-0277-z>.
- PAGALLO, U. 2018b. Robot Privacy and the Law as “Meta-Technology”. In: U. Pagallo et al. (eds.). *AI Approaches to the Complexity of Legal Systems: AICOL International Workshops 2015-2017 (Revised Selected Papers)*. Cham, Springer, p. 23-38.
- PAGALLO, U.; DURANTE, M. 2016. The pros and cons of legal automation and its governance. *European Journal of Risk Regulation*, **7**(2):323-334. DOI: <https://doi.org/10.1017/S1867299X00005742>.
- PALIWALA, A. 2016. Rediscovering artificial intelligence and law: an inadequate jurisprudence? *International Review of Law, Computers & Technology*, **30**(3):107-114. DOI: <https://doi.org/10.1080/13600869.2016.1229651>.
- SHEPPARD, B. 2018. Warming up to inscrutability: How technology could challenge our concept of law. *The University of Toronto Law Journal*, **68**(1):33-62. DOI: <https://doi.org/10.3138/10.3138/utlj.2017-0053>.
- SOLUM, L. B. 2019. Artificially Intelligent Law. *BioLaw Journal*, **1**:53-62. DOI: <http://dx.doi.org/10.15168/2284-4503-351>.
- SURDEN, H. 2019. Artificial Intelligence and Law: An Overview. *Georgia State University Law Review*, **35**(4):1305-1337. Available at: <https://readingroom.law.gsu.edu/gsulr>. Accessed in: 10/05/2020.
- TACCA, A.; ROCHA, L. S. 2018. Inteligência artificial: reflexos no sistema do Direito. *Nomos*, **38**(2):53-68. Available at: <http://periodicos.ufc.br/nomos/article/view/20493>. Accessed in: 10/05/2020.
- TUFFLEY, D. 2019. Human Intelligence + Artificial Intelligence = Human Potential. *Griffith Journal of Law and Human Dignity*. Special issue: “Law & Human Dignity In The Technological Age”: 170-189. Available at: <https://griffithlawjournal.org/index.php/gjlhd/article/view/1043>. Accessed in: 10/05/2020.
- VAN GENDEREN, R. H. 2018. Do We Need New Legal Personhood in the Age of Robots and AI? In: M. Corrales; M. Fenwick; N. Forgó (eds.), *Robotics, AI and the Future of Law*. Singapore, Springer, p. 15-56.
- YOON, A. 2016. The Post-Modern Lawyer: technology and the democratization of representation. *The University of Toronto Law Journal*, **66**(4):456-471. DOI: <https://doi.org/10.3138/UTLJ.4007>.

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