ARTIFICIAL INTELLIGENCE, LAW AND THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

INTELIGÉNCIA ARTIFICIAL, DIREITO E A AGENDA 2030 PARA O DESENVOLVIMENTO SUSTENTÁVEL

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Abstract

This paper has the following research problem: how can Artificial Intelligence (AI) contribute to the achievement of the goals of Agenda 2030 for Sustainable Development? In order to satisfy the problem, the first section aims to address the relationship between AI and SDG. Among the objectives that can be most influenced by technologies, both positively and negatively, are the SDG's that have water, health, agriculture, and education as their guideline. This approach will be achieved through the description and demonstration of reports provided by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). The second section of the report criticizes the reduction or eradication of adverse effects that AI can have on society. A case study from countries such as China, the United Kingdom, and Canada is used as a guideline since they have a strong influence on the scenario addressed. To this end, deductive and integrated research methods are used, as well as the technique of case study research. In the end, it is shown that AI is an essential factor in the equation posed by Agenda 2030, provided it is duly observed and regulated. Bibliographical research and the integrated research method will be used.

Keywords

Agenda 2030. Artificial intelligence. Sustainable development.

Resumo

O presente artigo tem como problema de pesquisa o seguinte questionamento: como a Inteligência Artificial (IA) pode contribuir para o cumprimento das metas da Agenda 2030 para o Desenvolvimento sustentável? Para a satisfação da problemática, a primeira seção objetiva abordar a relação IA-ODS's. Dentre os objetivos que podem sofrer maior influência das tecnologias, tanto positiva quanto negativamente, destacam-se os ODS's que tem como pauta a água, a saúde, a agricultura e a educação. Abordagem será realizada através da descrição e

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demonstração de relatórios fornecidos pela Organização das Nações Unidas para a Educação, a Ciência e a Cultura (UNESCO). Realiza-se na segunda seção críticas destinadas à diminuição ou à erradicação dos efeitos negativos que a IA pode trazer à sociedade. Utiliza-se como diretriz o estudo de caso extraído de países como China, Reino Unido e Canadá, já que exercentes de grande influência no cenário abordado. Para tanto, utiliza-se os métodos dedutivo e de pesquisa integrada, e a técnica de pesquisa de estudo de casos. Ao final, demonstra-se que a IA apresenta-se como importante fator da equação posta pela Agenda 2030, desde que devidamente observada e regulada. Utiliza-se a pesquisa bibliográfica e o método de pesquisa integrada.

Palavras-chave
Agenda 2030. Inteligência Artificial. Desenvolvimento Sustentável.

1. INTRODUCTION

The last decade has seen great advances in the development of Artificial Intelligence (AI).[2] Techniques such as machine learning[3] and deep learning[4] are continuously used in contemporary applications

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[2] The definition of the term under analysis is challenging to define. One of the first expressions for delimitation was expressed by McCarthy: "It *is the science and engineering of making intelligent machines, especially intelligent computer programs. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable*". MCCARTHY, J. What is artificial intelligence? Stanford University, p. 2-15, 2007.
One of the most accepted definitions in the scientific branch - although also criticized - is that of Russell and Norvig, who define Artificial Intelligence as: "[...] as the study of agents that receive percepts from the environment and perform actions". RUSSELL, Stuart. J.; NORVIG, Peter. Artificial Intelligence: a modern approach. 3. ed. New Jersey: Pearson Education, 2010, p. VIII. It is noted that both concepts presented recognize AI as an activity, whether it is directed to the use of tasks (McCarthy) or to the study of agents who practice actions when receiving information acquired from their environment.
[3] *Machine Learning* is "*the science of getting computers to learn and act like humans do, and improve their learning over time in autonomous fashion, by feeding them data and information in the form of observations and real-world interactions*". FAGGELLA, Daniel. In EDWARDS, Martin R.; EDWARDS, Kristen. Predictive HR Analytics: mastering the HR metric. New York: Kogan Page, 2019, p. 463.
[4] *Deep Learning* can be understood as "*an approach that involves the critical analysis of new topics and facts, linking them to already known concepts or forming new concepts, and leads to long term retention of concepts so that they can be used for problem solving in new situations. [...] The major characteristics of deep learning are: aiming for understanding, focusing on concepts, and relating new and previous knowledge*". CHANG, Daniel. Concept-

and objects to improve their usefulness and grant practicality to their users. One of the possible repercussions of the use of these technologies directed to the social character is the satisfaction of the Sustainable Development Goals (SDGs) proposed by Agenda 2030.[56].

This paper has the following research problem: how can Artificial Intelligence (AI) contribute to the achievement of the goals of Agenda 2030 for Sustainable Development?

For the satisfaction of the problem, the first section aims to address the relationship IA-SDGs. Among the objectives that can be most influenced by technologies, both positively and negatively, are the SDGs that have water, health, agriculture, and education as their guideline. This approach will be achieved through the description and demonstration of reports provided by

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Oriented Deep Learning. 2018. Disponível em: https://arxiv.org/ftp/arxiv/papers/1806/1806.01756.pdf. Acesso em: 20 abr. 2020.

[5] "Os Objetivos de Desenvolvimento Sustentável, também conhecidos como Objetivos Globais, são um chamado universal para ação contra a pobreza, proteção do planeta e para garantir que todas as pessoas tenham paz e prosperidade. Esses 17 Objetivos foram construídos com o sucesso dos Objetivos de Desenvolvimento do Milênio, incluindo novos temas, como a mudança global do clima, desigualdade econômica, inovação, consumo sustentável, paz e justiça, entre outras prioridades. Os objetivos são interconectados – o sucesso de um ODS envolve o combate a temas que estão associados a outros objetivos". PNUD. O que são os objetivos de desenvolvimento sustentável? Disponível em: https://www.br.undp.org/content/brazil/pt/home/sustainable-development-goals.html. Acesso em: 20 abr. 2020.

[6] A Agenda 2030 é um mecanismo de *soft law* (de observância facultativa) para os países que estão de acordo com suas prioridades atuar em parceria global para formação de um plano entre pessoas, o planeta e a prosperidade, objetivando fortalecer a paz mundial. O plano conta com 17 ODS e 169 metas que buscam erradicar a pobreza e promover a vida digna. Disponível em: PNUD. Plataforma Agenda 2030. Disponível em: http://www.agenda2030.org.br/sobre/. Acesso em: 20 abr. 2020.

the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

The possible implications of the use of AI in contemporary society are demonstrated in the course of the argumentation. In this way, the social, governmental, and legal sectors can follow up to act when necessary. It is also intended to state the possible risks and effects when using artificial intelligence technologies. Thus, the second section criticizes the reduction or eradication of adverse effects that AI can bring to society. A case study extracted from countries such as China, the United Kingdom, and Canada is used as a guideline since they exert a great influence on the scenario addressed.

In the end, it appears that the positive effects brought about by the adoption of the technologies involved in artificial intelligence can help to meet Agenda 2030 effectively. On the other hand, the detailed consequences, mainly related to the increase of possible internal and external inequality, are already being treated and discussed by those responsible for the development of AI as problems to be eventually faced. Ethical and moral situations can already be detected and discussed in primers and regulations to avoid or reduce the possible risks of adopting AI for sustainable technological development. To arrive at the present reasoning, bibliographic research and the integrated research method are used.

2. THE RELATIONSHIP BETWEEN ARTIFICIAL IN-TELLIGENCE AND THE 2030 AGENDA FOR ACHIEV-ING SUSTAINABLE DEVELOPMENT OBJECTIVES

The study and the results of the activities that have Artificial Intelligence (AI) as their object has presented significant advances in the last decade. Although there is a conceptual and ontological instability about the terminology[7], the discussion be-

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[7] *"I find it useful to distinguish what I will call "strong" AI from "weak" or "cautious" AI (Artificial Intelligence). According to weak AI, the principal value of the computer in the study of the mind is that it gives us a very powerful tool. For example, it enables us to formulate and*

comes secondary and irrelevant for the development of the problem initially proposed. Attention is turned to the effective results produced by this technology in order to demonstrate the phatic possibilities of its use, contribution, and satisfaction for Agenda 2030.

First, a prior approach is taken to understanding the functionalities of AI systems. The field of artificially intelligent entities can be bipartite. On the one hand, there is the rules-based approach, where the AI is programmed through a series of logical rules to infer thoughts. On the other hand, the field of neural networks (deep learning) adopts a more elaborate approach, where AI is programmed to simulate the human brain structure. As a result, layers of artificial neurons capable of receiving and transmitting information are obtained in a structure similar to biological neuron networks.[8]

here is a basic triad for the AI to function as expected. Computational power is the first of them. Using the hardware-software correlation, this set will be responsible for the algorithmic execution, the second element. The algorithm is a finite set of instructions that, if followed, perform a specific task, and its complexity may vary from something simple, such as the execution of activities by voice command, to something more complex, such as the analysis of genomes. Finally, the third pillar represents the recursive source of information on which the two previous pillars will
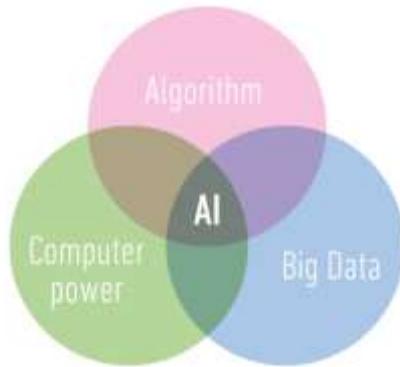
test hypotheses in a more rigorous and precise fashion. But according to strong AI, the computer is not merely a tool in the study of the mind; rather, the appropriately programmed computer really is a mind, in the sense that computers given the right programs can be literally said to understand and have other cognitive states. In strong AI, because the programmed computer has cognitive states, the programs are not mere tools that enable us to test psychological explanations; rather, the programs are themselves the explanation". SEARLE, J. Minds, brains, and programs. *Behavioral and Brain Sciences*. Vol. 3, n. 3. 1980, p. 417-424.

[8] LEE, Kai-Fu. Inteligência Artificial. Rio de Janeiro: Globo Livros, 2019, p. 20-21.

be executed: the Big Data[9]. The AI can be trained in a database for the recognition of possible patterns. After this verification, deep learning and machine learning allow the AI to learn from the processed information and make automated improvements in the analyzed activities in a way superior to human activities.[10]

The elementary demonstration of this triad can be visualized as follows:

Figure 1[11]

[9] "Big Data technologies describe a new generation of technologies and architectures, designed so organizations like yours can economically extract value from very large volumes of a wide variety of data by enabling high-velocity capture, discovery, and/or analysis. This world of Big Data requires a shift in computing architecture so that customers can handle both the data storage requirements and the heavy server processing required to analyze large volumes of data economically". VILLARS, R. L.; EASTWOOD, M.; OLOFSON, C. W. Big Data: What it is and Why You should care. White Paper. IDC: Analyze the Future. 2011. Disponível em: http://www.admin-magazine.com/HPC/content/download/5604/49345/file/IDC_Big%20Data_whitepaper_final.pdf Acesso em: 20 abr. 2020.

[10] For Andrew Ng, one of the main responsible for deep learning, AI can be compared to the use of energy idealized by Thomas Edison. LYNCH, Shana. Andrew Ng: Why AI Is the New Electricity. Stanford Business. 2017. Disponível em: https://www.gsb.stanford.edu/insights/andrew-ng-why-ai-new-electricity Acesso em: 20 abr. 2020.

[11] UNESCO, Artificial intelligence for sustainable development: challenges and opportunities for UNESCO's science and engineering programmes. 2019, p. 11.

This digital and technological ecosystem enumerates a proportional direction: the greater the number of information, the greater the responsiveness and results provided by the AI to the problems initially proposed. This process requires a high amount of work and adaptation that, depending on the activity, if executed solely by the human brain, could take months or even years. When carried out under the countless raw material production ratios provided by Big Data, deep learning opens a situation where one moves from specialization to the era of data. This change can present benefits if used in conjunction with tools capable of collecting data from the world and destining it to a more effective practical function capable of encompassing prevention and taking action. This is now the approach to SDGs.

2.1. Artificial Intelligence and Water Management: SDGs 6, 12 and 14

Sustainable Development Goals 6, 12, and 14 refer, respectively: ensuring the availability and sustainable management of water and sanitation for all (6); ensuring sustainable consumption and production patterns (12); and the conservation and sustainable use of oceans, seas and marine resources (14). The functionalities of the AI system allow the adoption of techniques and activities to form a solid basis for the intended efforts.

Using the Internet of Things (IoT),[12] the Redwood City, California-based Fracta Startup has designed a system to help water utilities save financial and ecological resources by prioritizing

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[12] IoT is "a world where physical objects are seamlessly integrated into the information network, and where the physical objects can become active participants in business processes. Services are available to interact with these „smart objects„ over the Internet, query their state and any information associated with them, taking into account security and privacy issues". HALLER, S.; KARNOUSKOS, S.; SCHROTH, C. The Internet of Things in an Enterprise Context. Vienna: Springer, 2008. p. 14-28

the replacement of water and distribution pipelines in cities. The utility analyzes as many variables as possible that interfere with the life cycle of a given pipe used for piping, but "as the number of relative variables increases, the only way to address this is through machine learning.

Fracta thus analyzes and correlates the data to the type of soil on which the pipes rest, topography, and weather records, and then applies machine learning to find patterns, throughout a city or region, that provide clues as to which pipes are at higher risk of leakage or failure. The company is currently working with two water utilities in the Bay Area to prove the effectiveness of its functional approach.[13]

Located in San Francisco, Valor Water Analytics has developed machine learning algorithms to detect inaccuracies or anomalies in water meter data. In this way, it becomes possible to locate where the water consumed may have been unbilled, conduct that costs the public billions. However, Valor also provides users with tools to use in order to reduce water use and identify leaks.[14]

In Serbia, the Water Centre for Sustainable Development and Climate Change Adaptation, which operates under the authority of UNESCO, uses artificial intelligence technology and statistical modeling for quality control of data obtained for structural and environmental monitoring of climate conditions.[15]

The UNESCO G-WADI application (Water and Development Information for Arid Lands - the Global Network) uses an artificial neural network (ANN) algorithm to estimate precipitation in real-time around the world. This product is called Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks - Cloud Classification System (G-WADI PERSIAN-CCS6). Through G-WADI it is possible to perform emergency planning and management of hydrological risks such as

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[13] Idem.
[14] Idem.
[15] UNESCO, Artificial intelligence for sustainable development: challenges and opportunities for UNESCO's science and engineering programmes. 2019, p. 19.

floods, droughts, and extreme weather events. The system is available to society through iRain, a mobile application that assists its users in collecting local data useful for global precipitation monitoring[16].[17]

One advantage of implementing systems that use IoT is the cost ratio. In principle, there is no need for any large, pre-existing physical infrastructure. They can be implemented effectively in remote areas. The wide range of sensors can be connected to a network that supports countless different scientific applications, including the provisions already expressed by Fracta and Valor Water Analytics. In this way, SDG 3[18] an be adhered to in a reflex way.

However, this is not the only sector where the use of AI stands out for the functionality of the first adjustments and optimizations of SDGs compliance. There is an opportunity for real extensions to the mass entrepreneurship of technological innovations aimed at sustainable development. Furthermore, another field reached is agriculture.

2.2. Artificial Intelligence and Agriculture: SDGs 2, 9 and 10

Hughes and Salathé are responsible for the PlantVillage project. The main objective is to provide the small farmer with the possibility of diagnosing diseases in his crop using only one

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[16] Rasp et al. developed an Artificial Intelligence program based on deep learning capable of improving weather detections and forecasts when analyzed through short-term simulations. For more, see in: RASP, Stephan; PRITCHARD, Michael S; GENTINE, Pierre. Deep learning to represent subgrid processes in climate models. PNAS. Vol. 115, n. 39, p. 9684-9689. Disponível em: https://doi.org/10.1073/pnas.1810286115.
https://www.pnas.org/content/pnas/115/39/9684.full.pdf Acesso em: 20 abr. 2020.

[17] Ibdem, p. 21.

[18] Garantia de uma vida saudável e promoção do bem-estar para todos em todas as idades

smartphone application. The developers justify the creation of the project in the existential situation of these people because plant diseases that affect their communities can directly affect their liveli-hoods and be disastrous.[19][20]

The application runs on a database of approximately 150,000 (one hundred and fifty thousand) photographs of plants with plant diseases. This number is expected to reach three million in the coming years. In the contemporary context, the analyses are focused on the diseases that the team believes are the most im-portant for that location. The developers use an AI that is part of a deep learning neural network capable of identifying with 98.21% accuracy which plant and which type of the disease are under analy-sis.

> Neural networks provide a mapping between an in-put, such as an image of a diseased plant, to an out-put, such as a crop-disease pair. Deep neural net-works recently have been applied successfully in many diverse domains. These networks are trained by tuning the network parameters in such a way that the mapping improves during the training pro-cess.[21]

With the technology on the agenda, data can be used to identify pathologies and improve predictions about when and

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[19] BREWSTER, S. Wilting shrubs? Diagnose plant diseases with an app. MIT Technology Review. 2016. Disponível em: https://www.technologyreview.com/s/602792/wilting-shrubs-diagnose-plant-diseases-with-an-app/ Acesso em: 20 abr. 2020.

[20] CHUCK, Gill. Artificial intelligence could help farmers diagnose crop diseases. 2017. Disponível em: http://news.psu.edu/story/429727/2016/10/04/research/artificial-intelligence-couldhelp-farmers-diagnose-crop-diseases Acesso em: 20 abr. 2020.

[21] CHUCK, Gill. Artificial intelligence could help farmers diagnose crop diseases. 2017. Disponível em: http://news.psu.edu/story/429727/2016/10/04/research/artificial-intelligence-couldhelp-farmers-diagnose-crop-diseases Acesso em: 20 abr. 2020.

where they will appear.[22] The impact of PlantVillage can be verified according to the numbers extracted from the plant reports. According to Hughes, cassava plantations feed about 600 million people. Also, in Nigeria[23] alone, the economic circulation of this plantation generates approximately 2 billion dollars. The use of the project can reduce by up to 40% the loss of the plantation in case of an epidemic in the cultivation.[24][25]

These projects have a high social impact. In the major low-income countries, there is a lack of studies, and government inputs focused on agricultural sciences. The use of information and communication technologies, associated with IoT interconnected devices, can be used as triggers to break the cycle of poverty since those responsible for cultivation will have the necessary information immediately and at a meager cost. PlantVillage, for example, once installed, does not require an Internet connection for its oper-

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[22] LOHR, S. From agriculture to art – the AI wave sweeps in. New York Times, Business Day. 2019. Disponível em: https://www.nytimes.com/2018/10/21/business/from-agriculture-to-art-the-ai-wave-sweeps-in.html Acesso em: 20 abr. 2020.

[23] "In Nigeria, AI is being employed to help farmers sell their produce and buy services via a bot platform that relies on SMS and other channels such as USSD, Slack, etc". WWWF. Artificial Intelligence: the Road Ahead in Low and Middle-Income Countries. World Wide Web Foundation. 2017. Disponível em: https://webfoundation.org/docs/2017/07/AI_Report_WF.pdf Acesso em: 20 abr. 2020.

[24] GORALSKI, Margareth A.; TAN, Tay Keong. Artificial intelligence and sustainable development. The International Journal of Management Education. Vol. 18, 2020, p. 5.

[25] Outro exemplo de tecnologia envolvendo IA no setor agrícola é o sistema Sequoia, desenvolvido pela Parrot. O Sequoia é um sensor multiespectral conectado a um drone, que combina uma câmera com um sensor solar GPS (raios ultravioleta e infravermelho), para análise da vitalidade da colheita com base na quantidade de luz que as plantas absorvem e refletem IM'NOVATION. Disponível em: https://www.imnovation-hub.com/society/types-of-smart-sensors-applied-to-agriculture/#0 Acesso em: 20 abr. 2020.

UNESCO, Artificial intelligence for sustainable development: challenges and opportunities for UNESCO's science and engineering programmes. 2019, p 16.

ation. Thus, these conducts demonstrate potential increases in the improvement and effectiveness of agricultural systems in smaller communities.

Thus, SDGs 2 (ending hunger, achieving food security and improving nutrition and promoting sustainable agriculture), 9 (building resilient infrastructure, promoting inclusive and sustainable industrialization and promoting innovation) and 10 (reducing inequality within and between countries) can be achieved if adequately managed this function of AI. Similar goals can also be achieved when we return to artificially applying intelligent entities to health and sanitation.

2.3. Artificial Intelligence and Health: SDGs 3 and 11

From 1949 until the turn of the millennium, the Chinese metropolis was full of bicycles. With social and economic reforms in the early 2000s, the automobile sector showed a significant increase. The use of bicycles became a stigma for impoverished people who were financially unable to use four-wheeled transport.

This scenario has changed rapidly since late 2015 when bicycle-sharing startups led by Mobike and Ofo began providing tens of millions of these Internet-connected vehicles to distribute them along China's major avenues. Mobike uses AI to create and equip its bicycles with QR codes and smart locks connected to the Internet around the rear wheel. When the user uses the application to scan the QR code, the lock on the wheel opens automatically. Thus, the user uses the product as needed. When the end, park the bike where you want for the next to use it. The costs vary according to the route and time, but in general, they cost fifteen cents or less. In the fall of 2017 alone, Mobike registered 22 million trips per day, almost all of them in China. To make a meaningful comparison, Uber, in that same year, made about four times fewer trips overall.[26]

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[26] LEE, Kai-Fu. Inteligência Artificial. Rio de Janeiro: Globo Livros, 2019, p. 98.

It is estimated that 2017 and 2020, the Nanjing Economic and Technological Development Zone will invest at least $450 million in AI development. Within this technological process, in 2015, the Chinese government stipulated the campaign "innovation and mass entrepreneurship". Since then, in 2017, China has gone from zero high-speed rail lines to accumulating more kilometers than the rest of the world combined.[27] ince then, in 2017, China has gone from zero high-speed rail lines to accumulating more kilometers than the rest of the world combined. With the training force of the AI companies involved in the segment, it becomes possible to reduce the daily stress of the heavy traffic of the big metropolises and, in the same way, the reduction of pollutant gases.

In the same way, RXThinking develops medical AI algorithms to become super-diagnosticators. Instead of replacing doctors with algorithms, RXThinking's AI diagnostic application empowers them. It acts as a "navigation application" for the diagnostic process, where it takes advantage of all available knowledge to recommend the best path, but still allows physicians to conduct the entire procedure.[28] This ensures the accuracy of the diagnosis as well as future treatments for sick people.

These technologies and enhancements are examples of how AI can be used to ensure healthy living and promote well-being for all at all ages (SDG 3) and to make cities and human settlements inclusive, safe, resilient, and sustainable (SDG 11). Seemingly sustainable connections demonstrate the scope of IA to meet other Agenda 2030 goals.

2.4. Other impacts of Artificial Intelligence on the Agenda 2030 SDG

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[27] Idem.

[28] LEE, Kai-Fu. 'The Algorithm Will See You Now'. AISuperpowers. 2019. Disponível em: https://aisuperpowers.com/blog/kai-fu-lee Acesso em: 20 abr. 2020.

Among the other sectors that stand out is that of education. As its development is intrinsically linked to technological development, especially the Information and Communication Technology (ICT) apparatuses, it is essential to maintain equal access to this recursal system.

On March 19, 2018, the government inaugurated the Centro Nacional de Educação Colaborativa em Robótica (Centre national collaborative de l'éducation en robotique, RobotsMali) at the new Cité universitaire de Kabala, south of Bamako. Besides teaching robotics and coding, RobotsMali offers training in AI, electronics, and IoT.[29]
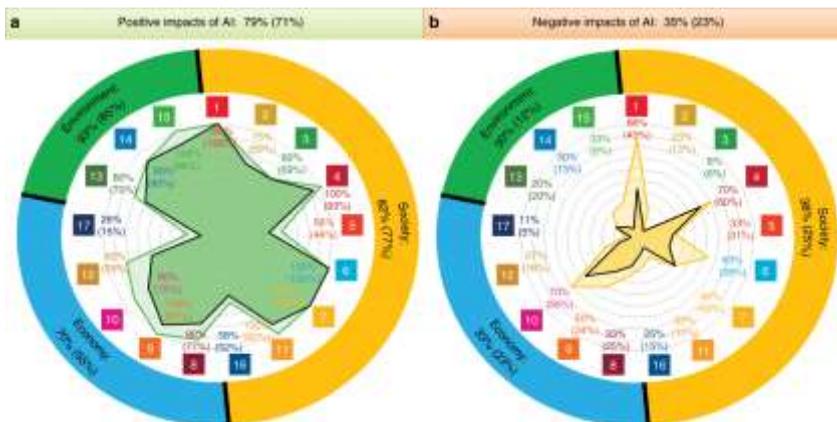
Another example of the use of artificial intelligence targeted at education is the VIPKid Teach application. Designed to connect U.S. teachers to Chinese students for online English classes, the application aims to facilitate and reduce borders by continuously collecting data on student involvement through facial and sentimental expression analysis. This data is used without accessing the profile of the students themselves, allowing the platforms to filter the types of teachers that are most compatible with the student in question.[30]

Vinuesa, R., Azizpour, H., Leite, I. et al. have developed a systematic study demonstrating the possible incursions of AI in the fulfillment of SDG as well as their possible negative reflexes. Its detailed display can be checked below.

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[29] UNESCO, Artificial intelligence for sustainable development: challenges and opportunities for UNESCO's science and engineering programmes. 2019, p. 45.
[30] VIPKID. https://m.vipkid.com/

Figure 2: Summary of positive and negative impacts of AI on various SDG [31]

The graph on the left represents the positive impacts of AI on the 17 SDGs according to its main influencing aspects (society, environment, and economy). It should be noted that about 79% of the possible impacts among the ODS are positive. The main objectives affected in this case are 1 (to end poverty in all its forms everywhere); 4 (to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all); 6 (to ensure the availability and sustainable management of water and sanitation for all); 7 (to ensure access to affordable, reliable, sustainable and modern energy for all); 9 (to build resilient infrastructure, promote inclusive and sustainable industrialization and promote innovation) and 14 (to conserve and use oceans, seas, and

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[31] VINUESA, R., AZIZPOUR, H., LEITE, I. et al. The role of artificial intelligence in achieving the Sustainable Development Goals. Nat Commun 11, 233 (2020). https://doi.org/10.1038/s41467-019-14108-y

marine resources in a sustainable manner for sustainable development).[32]

The positive impact of the practices that adopt IA for the fulfillment of Agenda 2030 must be taken into consideration for the practice of incentives directed to scientific production in this area. In both the computer sciences and the humanities, especially the law, the link existing in the human-machine relationship tends to diminish every day. Thus, extracting the considerable fruits of this symbiosis presents itself as a way to guarantee a sustainable life shortly.

It must be taken into consideration that it is not only the positive aspects that must be outlined. The influence of this type of technology can also bring negative impacts, capable of affecting the economic sector and the social sector. The question is: what are the possible results of the use of these technologies in regions where ethical scrutiny, transparency, and democratic control are lacking? In a broad sense, if technological control is concentrated in the minority, it can be seen that its use can worsen the situation experienced since local social groups could disseminate hateful practices and also influence the results of elections.[33]

An example of social change can be verified through a practice called Big Nudging that exploits users' psychological weaknesses in order to direct them to make decisions capable of creating problems related to the negation of social cohesion, democratic principles, and even human rights.[34]

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[32] Nerini, Slob, Engstrom, and Trutnevyte demonstrate how an intelligent city model using an AI can reduce carbon dioxide emissions within metropolises, which are responsible for 60% to 80% of CO_2 emissions in the atmosphere. FUSO NERINI, F.; SLOB, A.; ERICSDOTTER ENGSTRÖM, R.; TRUT-NEVYTE, E. A Research and Innovation Agenda for Zero-Emission European Cities. Sustainability 2019, 11, 1692. https://doi.org/10.3390/su11061692

[33] HELBING, D. & POURNARAS, E. Society: build digital democracy. Nature 527, p. 33–34, 2015. Disponível em: https://www.nature.com/news/polopoly_fs/1.18690!/menu/main/topColumns/topLeftColumn/pdf/527033a.pdf Acesso em: 20 abr. 2020.

[34] HELBING D. et al. Will Democracy Survive Big Data and Artificial Intelligence?. In: Towards Digital Enlightenment. Switzerland: Springer International

In the consumerist scenario, the use of artificial intelligence techniques is usually used. The credit score is used for predictability and consumer behavior control in the economic scenario. This allows the service provider the possibility of supplying or not supplying products or services based on the social and economic position of a particular person.[35]

> *This type of score is a clear example of threat to human rights due to AI misuse and one of its biggest problems is the lack of information received by the citizens on the type of analyzed data and the consequences this may have on their lives. It is also important to note that AI technology is unevenly distributed: for instance, complex AI-enhanced agricultural equipment may not be accessible to small farmers and thus produce an increased gap with respect to larger producers in more developed economies, consequently inhibiting the achievement of some targets of SDG 2 on zero hunger.*[36]

Another negative aspect of the use of AI in the social sector concerns the impact on the maintenance of gender equality (SDG 5). To date, available data and research assessing the capacity and potential impact of algorithmic technologies are insufficient. Image recognition, for example, can become an improved mechanism for gender and minority discrimination.[37]

Although the initial notes were directed to the positive aspects, another sector that may be negatively affected is the economic sector. Possible growth in inequality capable of directly and

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Publishing, 2019. Disponível em: https://doi.org/10.1007/978-3-319-90869-4_7 Acesso em: 20 abr. 2020.

[35] NAGLER, J., VAN DEN HOVEN, J. & HELBING, D. in HELBING D. (org). Towards Digital Enlightenment. Switzerland: Springer International Publishing, 2019, p. 41–46. https://doi.org/10.1007/978-3-319-90869-4_5

[36] VINUESA, R., AZIZPOUR, H., LEITE, I. et al. The role of artificial intelligence in achieving the Sustainable Development Goals. Nat Commun 11, 233 (2020). Disponível em: https://doi.org/10.1038/s41467-019-14108-y Acesso em: 20 abr. 2020.

[37] Idem.

significantly impacting SDG 8 (decent work and economic growth), 9 (industry, innovation, and infrastructure), and 10 (reduction of inequalities) are noteworthy.[38]

Brynjolfsson and McAfee propose that AI can exacerbate inequality also within nations. By replacing old jobs with jobs that require more skills, technology disproportionately rewards the educated. This may be due to the concentration of scientists in the field in certain countries. According to a recent Unesco report, about 49.1 percent of PhD students who are involved in computer science or engineering linked to AI development are Americans.[3940]

Furthermore, according to the Organization for Economic Cooperation and Development (OECD, 2017)[41], which analyzed the patenting behavior of the 2,000 most essential companies in research and development between 2012 and 2014, it found that in the contemporary scenario there is a broad concentration of AI patents in multinational companies based in only seven economies, which represented 93% of the AI patents registered in the five main patent offices.[4243]

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[38] COCKBURN, I., HENDERSON, R. & STERN, S. The Impact of Artificial Intelligence on Innovation (NBER, 2018). https://doi.org/10.3386/w24449 BRYNJOLFSSON, E. & MCAFEE, A. The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. W. W. Norton & Company, 2014.

[39] Idem.

[40] UNESCO, Artificial intelligence for sustainable development: challenges and opportunities for UNESCO's science and engineering programmes. 2019, p. 37.

[41] OECD (2017) Science, Technology and Innovation Scoreboard 2017: the Digital Transformation. Organisation for Economic Co-operation and Development, Paris.

[42] Patents registered with the top five patent families: European Patent Office, Japanese Patent Office, Korean Intellectual Property Office, State Intellectual Property Office of the People's Republic of China and the US Patent and Trademark Office.

[43] São eles: Japão (33%), República da Coréia (20%), EUA (18%), Província de Taiwan da China (9%) , China (8%), Alemanha (3%) e França (2%). UNESCO, Artificial intelligence for sustainable development: challenges and opportunities for UNESCO's science and engineering programmes. 2019, p. 30.

Also, the use of AI can adversely affect the use of electronic social resources, such as social media. It becomes possible to select and fractionate specific content according to algorithmic predictions based on user behavior. Ideal products and services are offered to people through pre-conceived analysis. A virtual niche is created where the user, in general, will only visualize the content that he or she initially already has contact with. New approaches tend to be restricted because they do not fit in with the accesses previously made. This practice can reveal a substantial political polarization and affect social cohesion, since voters X tend to acquire information only from party X, and not Y, due to the recommendation made by the IA. Consequently, SDG 10 will be affected, and the policy of reducing inequalities will suffer from these practices.[44]

This discipline demonstrates a new scenario in which the AI acts as an adjunct to scientific production and assists society in meeting its goals. It should be observed, however, to what extent the use of artificial intelligence can guarantee positivity and elasticity of social behavior. From a certain point of view, it could be concluded that such predictions constitute an almost unviable legacy of the reality of continuous movement and development. Without wanting to put into discussion the validity of this argument, it becomes necessary to reflect on the role that these allegations may have if considered valid and realized shortly. Codes of ethics and good conduct, linked to ethical apparatuses, can provide certain normative profiles linked to the market and political positions. From the process of producing justice, these codes are sometimes

Para mais, vide em UNESCO, Towards a monopolization of research in artificial intelligence? Natural Sciences Sector. 20 de julho de 2018. Disponível em: www.unesco.org/new/en/natural-sciences/sciencetechnology/single-view-sc-policy/news/towards_a_monopolization_of_research_in_artificial_   intellige Acesso em: 20 abr. 2020.

[44] FRANCESCATO, D. Globalization, artificial intelligence, social networks and political polarization: new challenges for community psychologists. Commun. Psychol. Glob. Perspect. 4, p. 20–41, 2018. http://siba-ese.unisalento.it/index.php/cpgp/article/viewFile/17684/15882

promoted by those responsible for the development of technologies themselves. It is at this time that assistance from a legal perspective becomes necessary. Law tends to act as a guarantor of the positive policies and props listed by AI and, at the same time, to diminish or eliminate negative predictions. For this reason, the next topic will be criticism aimed at diminishing or eradicating the adverse effects that AI can bring to society. A case study extracted from countries such as China, the United Kingdom, and Canada is used as a guideline since they have a great influence on the scenario addressed.

3. ARTIFICIAL INTELLIGENCE IN PROGRAMMING AND NORMATIVE PRODUCTION: THE ROLE OF LAW IN MEETING THE 2030 AGENDA

The representation of policies aimed at the development of AI gains prominence in some countries. In March 2017, the federal government of Canada was the first country in the world to announce an investment of $125 million for a national artificial intelligence (AI) strategy to be implemented over the next five years.[45]

The Pan-Canadian Artificial Intelligence Strategy developed by the Canadian Institute for Advanced Research (CIFAR), the Alberta Machine Intelligence Institute (AMII), the Vector Institute and the Montreal Institute for Learning Algorithms (Mila), provides support, resources, and talent for innovation and investment in AI.

Embora sejam conhecidos os aspectos positivos da aplicação da IA, o governo do Canadá também se preocupa com os reflexos da atividade computacional nos empregos, privacidade,

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[45] UNESCO. Canada first to adopt strategy for artificial intelligence. 2018. Disponível em: http://www.unesco.org/new/en/member-states/single-view/news/canada_first_to_adopt_strategy_for_artificial_intelligence/ Acesso em: 20 abr. 2020.

segurança digital, democracia e ética. Por esse motivo assumiu uma postura de liderança nos diálogos internacionais para entender as implicações sociais da IA. Em março de 2018, o Governo de Quebec propôs a criação de uma Organização Mundial da Inteligência Artificial (Omia) dedicada à promoção do consenso entre os Estados membros acerca de padrões e práticas de normatização de aplicações de IA.[46]

While the positive aspects of applying AI are well known, the Government of Canada is also concerned about the impact of computer activity on jobs, privacy, digital security, democracy, and ethics. For this reason, it has taken a leadership role in international dialogues to understand the social implications of AI. In March 2018, the Government of Québec proposed the creation of a World Artificial Intelligence Organization (Omia) dedicated to promoting consensus among member states on standards and practices for standardizing AI applications.[474849]

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[46] Idem.

[47] SÉVIGNY, B. Québec lays the groundwork for a world observatory on the social impacts of artificial intelligence and digital Technologies. 2018. Disponível em: http://www.scientifique-en-chef.gouv.qc.ca/en/nouvelles/quebec-jette-bases-dun-observatoire-mondial-impacts-societaux-de-lintelligence-artificielle-numerique/ Acesso em: 20 abr. 2020

[48] MONTREAL. Montréal Declaration for a Responsible Development of Artificial Intelligence. 2020. Disponível em: https://www.montrealdeclaration-responsibleai.com/ Acesso em: 20 abr. 2020.

"The Montreal Declaration, according to the specialized literature, delimits the first instrument dedicated to exploring principles and rules centered on the triad governance, ethics, and responsibilities of AI opposing the predominant conception around the biased, apparently neutral, and opaque applications of technologies employed in robotics and machine learning". POLIDO, Fabrício Bertini Pasquot. Inteligência artificial entre estratégias nacionais e a corrida regulatória global: rotas analíticas para uma releitura internacionalista e comparada. Rev. Fac. Direito UFMG, Belo Horizonte, n. 76, pp. 229-256, jan./jun. 2020. Disponível em:
https://www.direito.ufmg.br/revista/index.php/revista/article/view/2067/1931 Acesso em: 20 abr. 2020.

In June 2018, before the G7 meetings in Charlevoix, Quebec, Prime Minister Justin Trudeau, and President Emmanuel Macron issued a joint (Canada-France) statement on AI.

> *Canada and France affirm that artificial intelligence is a revolution whose impact is being felt more and more each day. In the near future, it will influence all human activity, providing unprecedented economic and social benefits. Innovations in artificial intelligence technologies will create new sources of economic growth that could make our economies more competitive, inclusive and sustainable, create jobs and shape a better future for all our citizens.*[50]

They committed to establish an international study group that would bring together experts from various countries and sectors and provides a forum to share analysis and best practices and provide foresight and coordination capacity. An important observation that can be made is that the government programs in question attempt to eliminate a purely market-based approach to the traits that are left behind in commercial transactions involving AI. Such technology, under Canadian guidelines, tends to be balanced and weighed against humanly relevant interests. The approach produced, therefore, must be reconciled with the humanitarian aspect and scope. This fact demonstrates a concern for the government that the subject is assuming a position of importance and relevance in the development of these new technologies.

In the same scope, the United Kingdom presents a policy with significant investments in the development of AI. The Artificial Intelligence Sector Deal is a £1 billion package of gov-

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STARK Luke, PYLYSHYN, Zenon W. Artificial Intelligence (AI), cit.; 'Here's how Canada can be a global leader in ethical AI'. In: The Conversation. February 22, 2018. Disponível em https://theconversation.com/heres-how-canada-can-be-a-global-leader-in-ethical-ai-90991. Acesso em: 20 abr. 2020.

[49] Idem.

[50] BAINS, N. S.; VIDAL, F. Canada-France Statement on Artificial Intelligence. 2018. Disponível em: https://www.international.gc.ca/world-monde/international_relations-relations_internationales/europe/2018-06-07-france_ai-ia_france.aspx?lang=eng Acesso em: 20 abr. 2020.

ernment and industry support to enhance and enshrine the UK's global position as a leader in the development of AI and related technologies. The project is taking tangible actions to promote industry-led AI and data challenges to ensure the UK is the premier destination for innovation and investment in AI.[51]

Aiming to create a secure environment to attract investors to the area, the project has a board to facilitate contact between the academic, industrial, and social sectors. There is also an office to take responsibility for supervising the project and fulfilling the commitments initially established. To assist, the Ethics and Data Innovation Center has been established to provide independent and expert advice on the measures necessary to enable and ensure safe, ethical, and innovative uses of AI and data-driven technologies.[52]

The concern with humanistic development and the use of AI in the social scope has attracted the interests of the House of Lords, which has formulated guidelines and indications for the government aimed at mitigating the risks of this technology when applied in society. The likely risks surrounding civil liability and criminal liability under which artificially intelligent entities can be agents if they are included in society without eventual regulation are highlighted. This is done by mitigating or predicting the hypothesis that the AI is malfunctioning or does not meet the initially intended scope, to facilitate future legal discussions around this issue.[53]

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[51] UNITED KINGDOM. AI Sector Deal One Year On. 2019. Disponível em: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/819331/AI_Sector_Deal_One_Year_On__Web_.pdf Acesso em: 20 abr. 2020.

[52] Idem.

[53] "Mitigating the risks of artificial intelligence Legal liability Recommendations 55-56 lv. In our opinion, it is possible to foresee a scenario where AI systems may malfunction, underperform or otherwise make erroneous decisions which cause harm. In particular, this might happen when an algorithm learns and evolves of its own accord. It was not clear to us, nor to our witnesses, whether new mechanisms for legal liability and redress in such situations are required, or

In the East, China presents a development plan aimed at gaining leadership in AI. The so-called AI Development Plan (IAPL) aims to put the country as a global forerunner in this field by 2030. Published in 2017, the Development Plan for a New Generation of Artificial Intelligence of the Chinese Council of State shared some of the recommendations of the plan expressed by the White House in 2016, until then chaired by Obama. It is intended

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whether existing mechanisms are sufficient. (Paragraph 317) lvi. Clarity is required. We recommend that the Law Commission consider the adequacy of existing legislation to address the legal liability issues of AI and, where appropriate, recommend to Government appropriate remedies to ensure that the law is clear in this area. At the very least, this work should establish clear principles for accountability and intelligibility. This work should be completed as soon as possible. (Paragraph 318) 95. Government welcomes the above recommendation and the acknowledgement of potential errors produced through artificial intelligence technologies and their potential implications. We believe that artificial intelligence technologies should serve people, businesses, and sectors beneficially and, where any outcomes resulting from errors are detrimental to these groups, remedial action should be undertaken. The Office for Artificial Intelligence, Centre for Data Ethics and Innovation, and the AI Council will take these concerns into consideration and, as appropriate, engage the Law Commission on best course of action. Criminal misuse of artificial intelligence and data Recommendations 57 - 59 lvii. The potential for well-meaning AI research to be used by others to cause harm is significant. AI researchers and developers must be alive to the potential ethical implications of their work. The Centre for Data Ethics and Innovation and the Alan Turing Institute are well placed to advise researchers on the potential implications of their work, and the steps they can take to ensure that such work is not misused. However, we believe additional measures are required. (Paragraph 328) 96. A response to recommendation 57 can be found in the final section of this document. 32 lviii. We recommend that universities and research councils providing grants and funding to AI researchers must insist that applications for such money demonstrate an awareness of the implications of the research and how it might be misused, and include details of the steps that will be taken to prevent such misuse, before any funding is provided. (Paragraph 329)". UNITED KINGDOM. Government response to House of Lords Artificial Intelligence Select Committee's Report on AI in the UK: Ready, Willing and Able? 2018. https://www.parliament.uk/documents/lords-committees/Artificial-Intelligence/AI-Government-Response2.pdf Acesso em 20 abr. 2020

to: increase funding for research, intensify civil-military coopera-
tion, and make investments to reduce possible social disruption.[54]

In a complementary way, legal and governance issues
are intrinsically linked to the development of Chinese AI. The legal
and government sectors have paid increasing attention to the gov-
ernance of AI, from short-term issues to existential risks. Under a
section on Safeguard Measures, the State Council's AI plan estab-
lishes a framework for the development of laws, regulations, and
ethical standards to use this technology. There are a preference and
desire for reforms in the legal system to address the effects of AI
on criminal liability, privacy, intellectual property rights, and infor-
mation security. Forward-looking normalization measures include
multi-level structures that determine the morality of AI systems,
ethical structures for human-machine collaboration, and codes of
conduct for researchers, developers, and designers of these prod-
ucts. The main objective of the plan is regulation on national terri-
tory but recognizes that the adoption of any international treaties is
crucial for the development of China's AI. To this end, China is
asked to "strengthen research on common global problems" (robot
operating problems, where robots diverge from their manufactur-
ers' predefined goals) and "deepen international cooperation on
artificial intelligence laws and regulations, international rules, etc.,
to address global challenges jointly.[55]

The representation of this scenario demonstrates the
position of a society facing a possible problem of balancing interna-
tionally relevant interests. This discipline is examined and dissected
in search of local, national, and supranational rules from the per-
spective of the data presented in the previous section. With a view
to objectivity, the set of information provided will be represented

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[54] LEE, Kai-Fu. Inteligência Artificial. Rio de Janeiro: Globo Livros, 2019, p.
121.
[55] DING, J. How China Seeks to Govern AI. Medium. September 5, 2018.
Disponível   em   https://medium.com/@ChallengesFnd/how-china-seeks-
togovern- ai-baf1c0cd1a54 Acesso em 20 abr. 2020.

by the X/Y relationship, where X characterizes the SDGs and Y their goals..

The first framework with inhibitory influences on AI can be verified when its intended use for the eradication of extreme poverty for all people everywhere (1/1) has adverse effects when applied in developing countries. What stands out most is the possible substitution of jobs for individuals by automated entities. While the adoption of the practice of automation can transform a low-income country into a middle- or high-income country, if its industrial sectors do not have the appropriate levels of sophistication to be compatible with the education provided to society and to provide adequate satisfaction of the demand, there will be a simple substitution of the processes manufactured by the industrialists. Possibly there will be no provision of productivity and job creation benefits for the low-skilled workforce. Consequently, the level of extreme poverty may increase exponentially.[56]

At this point, it is essential to emphasize the duty of fulfilling the social function of entrepreneurial activity. The mere economic expression stating the results and values of the business activity performed is insufficient to make its effects on society effective. The predatory capitalist conducts must be stigmatized in favor of a harmonic relationship among the social, political, and legal sectors. If artificial intelligence techniques replace an exponential number of workers due to insufficient educational compatibility, the government sectors are responsible for promoting this branch for gradual qualification improvement. When the existence of these practices and conducts is verified, the entrepreneur is assigned the task of stimulating the local economy to fulfill its social function. In this way, the 1/1 ratio can be achieved without an increase in the adverse effects.

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[56] NAGANO, Aki. Economic Growth and Automation Risks in Developing Countries Due to the Transition Toward Digital Modernity. In: Proceedings of the 11th International Conference on Theory and Practice of Electronic Governance. Galway, Ireland, 2018, p. 42-50. Disponível em: https://doi.org/10.1145/3209415.3209442 Acesso em: 21 abr. 2020.

Another negative influence can be verified in 1/3 and 1/4. Concerning the former, the impact of the use of AI can considerably increase the concentration of income and generate greater social inequality. Although the number reaches tens of thousands, hardware engineers and software and application developers carry out projects with incredible sophistication and technique to provide them to society. What is hidden under this cloak is the amounts paid to those most prominent. Few are the positions in the high-tech sector, but those that do exist are paid in considerable amounts. A senior Microsoft software engineer, for example, earns about $217,305 per year. Meanwhile, 4 of the ten richest people in the world hold positions in technology companies. Thus, this contemporary presentation can serve as a basis for government adoption of distributive justice practices, directing public policy to less favored sectors and social microsystems.[57][58][59][60]

Equal access to economic resources, as well as access to essential services, ownership and control over land and other forms of ownership, inheritance, natural resources, new appropriate technologies, and financial services, including microfinance proposed by the 1/4 relationship, can be considerably impacted. The practice of granting resources via the market analyzes the position of the person concerning the economic practices he or she exercises. The default rate is taken into account to calculate objec-

[57] MOKYR, J. Secular Stagnation? Not in Your Life. In: TEULINGS, C.; BALDWIN, R. Secular Stagnation: Facts, Causes and Cures. London: Centre for Economic Policy Research, CEPR, 2014, p. 88.

[58] PAYSA. Microsoft Senior Hardware Engineer Salaries. Disponível em: https://www.paysa.com/salaries/microsoft--senior-hardware-engineer. Acesso em: 21 abr. 2020.

[59] FORBES. The world richiest in 2020. Disponível em https://www.forbes.com/billionaires/ Acesso em: 21 abr. 2020.

[60] Para uma crítica a justiça distributiva, ver: ZANITELLI, Leandro Martins. Direito privado, justiça distributiva e o argumento da dupla distorção: uma revisão da literatura. Revista Brasileira de Políticas Públicas, Brasília, v. 5, nº 1, 2015 p. 317- 33.

tive factors expressed through a score. The lower the score, the lower the chances to have access to this sector. The practice of nudging already described above is based on the collection and processing of data from citizens. In this case, the AI would negatively impact the achievement of this objective is used to decide whether or not the financial institution will accept a loan proposal.[61]

The promotion activity has an exponent influence on the activities related to data collection and treatment. In this case, the law must act vigorously to verify the strict legal compliance directed to the principiological approach and respect for the informational self-determination of the data subject. There is a proportional relationship between the amount of data and the marketing influence exercised by its holders. This pessimistic evaluation is perhaps the one that represents the greatest ideological burden of the problem and should be criticized and analyzed from the perspective of private autonomy. Although Big Data provides tools to improve digital activities, it is executed generically by the data platform that composes its system. This could affect the articulation proposed in 1/a, since the mobilization of the resources carried out may remain in the possession and property of a restricted economic group, preventing its dissemination for cooperation and development. Therefore, it is necessary to strengthen the power of citizens (individual empowerment) so that they can be favored by technological innovation and have their rights respected as economic development also advances.[62]

Agricultural productivity and the income of small food producers expressed by the 2/3 ratio had its positive aspect previously demonstrated when the Plant Village program was adopted.

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[61] BISSIO, R. Vector of hope, source of fear. Spotlight on Sustainable Development. Chapter 3, p. 77-86, 2018. Disponível em: https://www.2030spotlight.org/sites/default/files/spot2018/chaps/Spotlight_Innenteil_2018_chapter3_bissio.pdf. Acesso em: 21 abr. 2020.
[62] RODOTÀ, Stefano. A vida na sociedade da vigilância: a privacidade hoje. Tradução de Danilo Doneda e Luciana Cabral Doneda. Rio de Janeiro: Renovar, 2008, p. 126.

However, the same technology can be used in large plantations to foster the growth and development of agribusiness. Is there a cost x benefit ratio at stake for the entrepreneur: helping the small farmer and making lower profits or providing large-scale agricultural technologies to be implemented in automated tractors and drones for the large farmer? Apparently, the economic bias tends to prevail in this case. For this reason, family farming can be considerably hampered if the direction of technology use is for other purposes than sharing it with this community.[63]

Another difficulty encountered in the use of AI technologies is to end all forms of discrimination against all women and girls everywhere (5/1). First of all, it should be kept in mind that the abstractions and techniques used in artificial intelligence programming are formulated based on machine learning and deep learning architectures. Processing is usually done in natural language, where algorithms are uncritically trained in a database extracted from the real world. However, if there are biases with gender or race stereotypes in the applications under analysis, the AI will also learn to reproduce them according to pre-existing standards. In short, the technology learns from the discriminatory load that already exists and replicates it.[64]

The legal activity, in this case, must prioritize reflections that are aimed at the achievement and dissemination of technological justice. The intention is to eliminate these distortions and discriminatory misunderstandings included in natural language so that AI acts equitably and guarantees material equality for women. In response to this problematic situation, aiming at the elimination

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[63] WEGREN SK. The "left behind": Smallholders in contemporary Russian agriculture. Journal of Agrarian Change, v. 18, n .4, p. 913-925, 2018. Disponível em: https://doi.org/10.1111/joac.12279. Acesso em: 21 abr. 2020.

[64] BOLUKBASI, T., Chang, K. W., ZOU, J. Y., SALIGRAMA, V. & KALAI, A. T. Man is to computer programmer as woman is to homemaker? Debiasing word embeddings. Advances in Neural Information Processing Systems, vol. 29, p. 4349–4357, 2016. Disponível em: https://arxiv.org/pdf/1607.06520.pdf. Acesso em 21 abr 2020.

of this social precondition, it is increasingly concerned with the production of fair algorithms.[65] This pioneering version expresses the possibility of abandoning a model of non-intervention for legal actions aimed at maintaining the needs of fighting discrimination.[66]

In the same sense, as expressed above, technology can help to achieve universal and equitable access to drinking water (6/1). However, management systems may suffer some emergency interferences that require a particular value for decision making. If there is complex water management in a city X and it is affected by a severe drought, how should the AI act? First, the risk groups in the city should be checked. Rationing, in principle, could not drastically affect the regions where hospitals and activities necessary to maintain health are concentrated. However, how to analyze if the population living at the edge is in a more precarious situation than that living in urban centers? In this case, the bias algorithms should lead the AI to a fairer decision making. From this point of view, although it seems that the technology realizes value, the decision is made strictly based on statistical criteria, aiming at minimizing possible losses in the face of the decision taken.[67]

The picture described can also affect the completion of support and strengthening the participation of local communities to improve water and sanitation management (6/b). As the decisions will be made in an automated way, the participation of the target subjects will be harmed, since the whole process will be carried out computationally and far away from the affected site. One option

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[65] FRIEDLER, S. A. et., al. A comparative study of fairness-enhancing interventions in machine learning. Proceedings of the Conference on Fairness, Accountability, and Transparency, January 2019 Pages 329–338. Disponível em: https://doi.org/10.1145/3287560.3287589. Acesso em: 21 abr. 2020.

[66] ZLIOBAITE, I. Measuring discrimination in algorithmic decision making. Data Mining and Knowledge Discovery, v. 31, p. 1060–1089, 2017. Disponível em: https://doi.org/10.1007/s10618-017-0506-1 Acesso em 21 abr. 2020.

[67] COURTLAND, R. Bias detectives: the researchers striving to make algorithms fair. Nature. 558, p. 357-360, 2018. Disponível em: https://media.nature.com/original/magazine-assets/d41586-018-05469-3/d41586-018-05469-3.pdf. Acesso em: 22 abr. 2020.

for this situation is intermediation through delegation to a representative, the inclusion of service channels through applications, or the establishment of SAC so that the local population can interfere in the decision-making processes and benefit from it.

In the latter two situations described, legal action is limited. Competent actions are directed to the executive branch for the fulfillment of tasks that are focused on the implementation of public policies. The law, in this case, will have the function of supervising the constitutional norms and the precepts established for the materialization of human dignity.

Finally, reducing inequality within and among countries may be one of the objectives most affected by AI. The recursive models for the operation of this technology focus on the allocation of data extracted from Big Data. The more advanced a country's technological landscape, the greater the amount of data extracted. Google alone, for example, registers about 5 billion daily searches on its platform. Approximately 1 billion hours of video watched daily on the Youtube platform. The amount of data extracted from electronic, contractual relations on these platforms far exceeds that of developing countries. Furthermore, this can generate a great deal of inequality in the management of these valuable technological resources.[6869]

In this case, the legal activity can act as an intermediary and establish criteria for cooperation among nations to share this database. Such attitude not only gives rise to the development of countries below the technological line but also to the interpretative improvement of the data since different algorithms from different nations tend to analyze and continuously improve them.

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[68] INTERNET LIVE STATUS. Google Search Statistics. 2020. Disponível em: https://www.internetlivestats.com/google-search-statistics/. Acesso em: 22 abr. 2020.
[69] YOUTUBE. Disponível em: https://www.youtube.com/intl/en-GB/about/press/. Acesso em: 22 abr. 2020.

This may even affect a stronger representation and voice of developing countries in decision-making in global economic and financial institutions in order to produce more effective, credible, accountable, and legitimate institutions (10/6). As most people living in poverty are citizens of G20 countries, Cisco predicts that by the end of 2020, only half the world's population will be online (4.1 billion Internet users out of a total population of 8 billion). Big Data's resources are not and will not be equitably available on the world stage unless there are treaties and reciprocity pacts to increase this conduct. The question does not arise from regulation or non-regulation in this case, but how to do it.[70]

These are some of the categorical examples that develop in society a new human construction capable of significantly altering social provisions. The role and function of the right are attributed to the duty of intermediation in this indispensable relationship. Linked to the development of AI, there is the risk of data market monopolization. Thus, it is necessary to use legal discipline to maintain the connection between the immersion of new technologies and the organizations generated by their results. It is not intended to guide or at least limit the income of those involved. On the contrary, it is intended to apply AI as an instrument capable of achieving sustainable development aimed at maintaining a sustainable world.

The novelty is radical. The risks of society linked to the development of intelligent entities are traditionally linked to the political and economical use of power. In this perspective, the idea of control is outlined, which must be relativized by the whole and by the coordination between countries involved in this scenario. If the models of the functionality of artificial intelligence are taken into consideration, the idealization of sharing the algorithms used in their execution is something extremely beneficial to participants,

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[70] BISSIO, R. Vector of hope, source of fear. Spotlight on Sustainable Development. Chapter 3, 77-86 2018. Disponível em: https://www.2030spotlight.org/sites/default/files/spot2018/chaps/Spotlight_Innenteil_2018_chapter3_bissio.pdf. Acesso em: 21 abr. 2020.

including developers, since such code can be improved by net-worked subjects for better-correlated fluidity of AI response capacity.

Therefore, the function of the Law in this scenario is not to act as a tool to hinder the application of AI in society, but as a coordinator and coadjuvant capable of observing and only being active when necessary. The data in question assume a particular prediction that AI tends to grow in the USA, the United Kingdom, or China. Furthermore, it is precisely the characterization of this technology as a resource capable of creating a complete examination of the current dynamics to demonstrate that we are entering a situation in which if there is no participation and involvement of sovereign government entities, the wrapping will be broken, and the adverse effects tend to increase. The Law, therefore, must work to maintain the limits of planning and justice.

4. FINAL CONSIDERATIONS

Words such as right or wrong do not seem to be correctly employed when we approach the subject of artificial intelligence. From this is born the disturbing realization of the immense difficulty in representing reality through language. Viable or non-viable may be the terms that bring more credit to this branch if we consider the benefits and harm of these new technologies.

It has been demonstrated in the argumentative discourse the existence of possible activities focused on health, education, and economics in which artificial intelligence can act as a precursor of Agenda 2030. The association between companies aimed at establishing intelligent cities can drastically reduce water and energy consumption through better management. Similarly, the introduction of such technology in agriculture can facilitate the development of small communities capable of affecting SDG considered essential to Agenda 2030. It is not by chance, either, that in the health sector, artificial intelligence can help professionals to

diagnose their patients' diseases better. All of these examples and others that have been worked on highlight the power of the globalized world, both in physical space and cyberspace, in the connection between AI and society. However, who dictates the rules of this global world?

Criticism has been verified about the monopolization of the artificial intelligence market, as well as ethical and moral attitudes involving questions related to the responsibility of their conduct. This scenario gives rise to an insistence on the need for a series of public and collective actions at the national and international levels to reduce and make symbolic this virtual constitutive threat. It is clear how these guidelines are being adopted through policies adopted in Canada and the United Kingdom. Many are the guarantees intended to protect society from this risk. The countries involved do not aim to bring the greater economic and social discrepancy to their nation. Moreover, this is one of the reasons why the governments themselves are making investments on the agenda. Thus, the results obtained can be delivered to the society in question.

If the problems, if negative influences of AI, are ignored, there is indeed a high potential for this technology to act as a setback to Agenda 2030. For this reason, it is up to the Law, especially by acting through public provisions and policies, to satisfy or at least equitably leave economic and social development. In other terms, one cannot postulate the indifference of the traditional framework of rights to the new sustainable environment, maintaining merely active market criteria. Therefore, a humanitarian constitution of the activities involved by the IA is expected in order to comply with Agenda 2030.

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